

Torque Testing System: Flowserve Corporation

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List of Nomenclature

Accuracy: Ratio of highest deviation of a value represented by the sensor to the ideal value.

Axial Thrust: Force induced in the direction of an axis, in this case the shaft.

Calibration: Setting a sensor output to a precise and accurate known input.

DAQ: Data Acquisition System - computer dedicated to capturing the data from sensors and controlling the components of the system.

Dynamic Torque: Torque induced in the presence of angular acceleration, such as the changing of rotation speeds.

Hydrodynamic Feature: Laser etching on one or both seal components on the seal interface designed to cause fluid in the interface to behave in a peculiar way, often causing lift.

Hysteresis: Sensor characteristic of faithful repetition of output data in both directions of operation.

Lateral Thrust: Force induced in an outward direction from a shaft.

Leakage: Fluid that escapes through the mechanical seal interface.

Linearity: Used in sensor specifications - defined by the output being directly proportional to the input, and the outcome resulting in a straight line.

Mechanical Seal: Subsystems implemented within machines with rotating shafts, such as pumps and compressors, in order to minimize leakage where the shaft exits the housing.

Range: Area of variation between the upper and lower limits on a particular scale.

Resolution: Smallest range detectable by a sensor.

Response: Time taken to approach true output when subjected to a step input.

Rotor Seal: Seal component rotating with the shaft, coincident with the stator seal.

Seal Interface: Area in which the stator seal and rotor seal touch.

Static Torque: Torque induced without the presence of angular acceleration, both at zero rotation as well as constant rotation.

Stator Seal: Seal component pinned so as to restrict movement; is coincident with the rotor seal.

Strain Gauge: A device for indicating the strain of a material or structure at the point of attachment.

Telemetry: The wireless transmission and reception of measured quantities in order to remotely monitor system parameters.

Torque: Force induced by a moment about an object.

Zero: Datum point.

Zero Drift: Signal level variance from set zero. Introduces error into measurement.

Executive Summary

Objective

This report contains detailed information for the successful completion of the Flowserve Mechanical Seal Torque Testing Assembly. The purpose of this project was to design a testing system to measure the torque occurring between mechanical seals within a pump rated at 200 psi and 70°F. The new assembly would replace the current system while reducing hysteresis and increasing accuracy in the measurement. Additionally, the system needed to include a motor that would drive a shaft at variable speeds up to 3600 RPM, and a system for capturing the leakage from the pressure vessel.

Component information

The final assembly employs a rotating digital telemetry collar fastened to a custom-designed coupling with titanium bars and strain gauges adhered to thin sections that experience torque due to friction at the seal interface. The coupling spans the joining of two shafts, one of which is fit over the other like a sleeve. Internal bearings reduce the parasitic loading effects from the pressure vessel. The torque measurement from the strain gauges is sent to a transmitter via antenna, and is then sent to a DAQ system. The leakage system outputs the rate of fluid leakage to the DAQ as well.

Cost Summary

Expenditure	Amount
Purchased parts, Outsourced labor	\$ 20,738.26
Flowserve Costs	\$ 48,378.22
Leakage Detection	\$ 451.79
Cal Poly Calibration Tester Mechanism	\$ 82.20
Travel	\$ 850.00
Total Cost	\$ 70,500.47

Testing and Analysis

Below is the summarized data from testing. The torque output of our system was measured at various pressures and speeds. The torque deviation from average shows the difference in torque from the average value based on a given pressure and speed.

Seal Chamber Pressure	Speed	Torque Deviation from Average
50 psi	1500 RPM	0.179 in-lb
	2500 RPM	0.327 in-lb
	3500 RPM	0.220 in-lb
100 psi	1500 RPM	0.275 in-lb
	2500 RPM	0.422 in-lb
	3500 RPM	0.222 in-lb
150 psi	1500 RPM	0.569 in-lb
	2500 RPM	1.440 in-lb
	3500 RPM	0.184 in-lb
200 psi	1500 RPM	1.087 in-lb
	2500 RPM	0.217 in-lb
	3500 RPM	0.459 in-lb

Introduction

Flowserve Corporation provides products and customer support to companies in the process industry for the design, testing, and manufacturing of mechanical seals. This includes, but is not limited to, companies concerned with power generation, fossil fuels, water resources, and chemical processing. In industries where fluid transportation is leveraged, mechanical seals have been utilized in pumps to increase performance. A mechanical seal is a design feature in pumps that seal the impeller housing and allow for little to no leakage. This technology is cutting edge and a considerable amount of research pertaining to the advantageous effects of specialized surface features is being pursued in order to enhance the performance characteristics of Flowserve's mechanical seals. The purpose of the project detailed in this report is to further advance the technology associated with the micro features on the seal surface.

As a result of research and communication with Flowserve, the desired result of this project is to provide a more refined testing system in order to advance Flowserve's pursuit to design state of the art mechanical seals. The life of a mechanical seal is greatly determined by the amount of torque at the seal interface; therefore, the primary goal of this project will be creating the best method for torque measurement. The existing testing system at Flowserve's facility is sufficient for measuring the torque at the seal interface. However, improvements of the testing system will yield more accurate measurements and further advance sealing technology. These improvements include (but are not limited to) a more accurate torque measurement method with a LabVIEW compatible DAQ system, leakage detection and volume measurement, and the inclusion of a high speed camera to capture images that would provide further knowledge regarding surface feature effects on seal performance.

Objectives

In order to advance Flowserve's laser etching technology, a more refined testing system is needed. The new system will include a means of visual inspection of the seal interface, as well as the ability to include a high-speed camera that is to be mounted in the axial direction in relation to the seals. A mobile housing unit will withstand up to 200 psig with fluid temperatures ranging from 70 – 200 degrees Fahrenheit, and allow for a user variable driving speed of 3600 RPM. A DAQ system will monitor environmental properties and a more precisely calculated torque.

In order to keep advancing the technology associated with the seals' micro features (discussed in the following section), Flowserve must have the ability to see how the working fluid in the pump interacts with the seal interface. Therefore, one of the goals is to provide a means of visual inspection of the seal interface while the test system is operating. This testing apparatus will be mobile, with easy connect-disconnect ports compatible multiple support systems in Flowserve's facility. A DAQ system will be incorporated in order to directly measure the torque at the seal interface in real time. Flowserve has provided a list of specifications to be included in the final product, shown below in Table 2. It includes a brief description, the necessary tolerances, and the relative importance of each. The risk column describes the difficulty of meeting of each specification. An "H" denotes a high risk, "M" denotes medium risk, and "L" denotes low risk. The notations for "Compliance" are explained in Table 1. Note that more than one method of evaluation compliance may be applicable to any one specification. The complete list and assessment can be viewed in the Quality Function Deployment (QFD) matrix in Appendix A.

Table 1. Key to Formal Engineering Requirements Compliance

Letter	Method of Evaluation
A	Analysis
T	Test Performed
S	Single comparison to point of reference
I	Inspection, go/no-go

Table 2. Formal Engineering Requirements

Specification	Parameter Description	Requirement or Target	Tolerance	Risk	Compliance
1	Housing Pressure Rated	200 psig	Max	M	A, T, S
2	Shaft Operation	Variable speed up to 3600 rpm	Max	L	T, S
3	Temperature	Working fluid temp 70-200°F	Max	L	T, S, I
4	Data Collection	DAQ with LabVIEW		L	S
5	DAQ	Resolution of 0.025 in-lbs; accuracy of 0.25 in-lbs		H	T
6	Auxiliary Measurement	Collection of escaped fluid		L	T, I
7	Safety	Meet or exceed Flowserve's safety standards	Min	L	T, S
8	Assembly	Design for easy assembly		M	A
9	Compatibility	Connect with current support system		L	A, T, S
10	Cost	Budget of \$10,000	Max	M	A
11	Set-up Time	Comparable to existing system	Min	L	T
12	Camera	Inclusion of EnviroCam		M	A, I
13	Transport	Able to move with ease		L	T, I
14	Test Conditions	Working fluid is water		L	A, T, S
15	Visual Inspection	View seal interface		M	A, T, I

The matrix also includes implied requirements, namely ergonomics and serviceability. Our system will be designed with assembly and serviceability in mind. The system will allow for straightforward troubleshooting, disassembly, access to components, and reassembly.

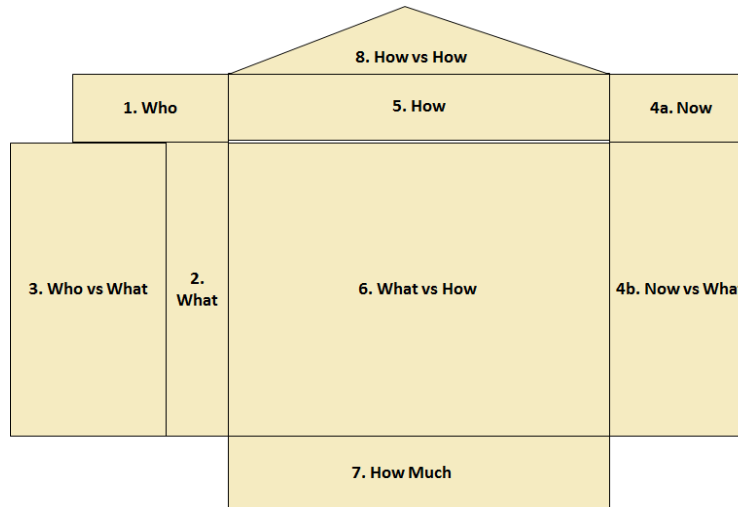


Figure 1. Quality Function Deployment (QFD) matrix

Figure 1 above is a simplified QFD. The matrix encompasses the process that is used to help quantify customer requirements and to generate engineering specifications for the development of a product. The “Who” section of the QFD specifies any parties who will be impacted by the project. Beneath “Who” is the “What” section, which contains the customer requirements. To the left, “Who vs. What” determines the relative importance of each requirement to each specified customer. The “How” section consists of engineering specifications, which are determined by either explicitly or implicitly stated customer requirements. The center of the table, “What vs. How”, is where relations are made between the customer requirements and engineering specifications. The combination of the previous two sections allows for the determination of a Technical Importance Rating and the relative significance of each of the target, or “How Much” aspects. The triangular top portion of the QFD relates the different engineering specifications. Specifications are given a (+) if they promote each other, a (-) if they adversely affect each other, and left blank if they do not affect each other. The right side of the table compares the customer requirements against the existing products found in the market. This section helps to identify any missing specifications in current systems and define the need for the new product. The bottom section “How Much”, defines the quantitative values or specific actions for each of the engineering specifications.

Based upon this analysis, the SEALS team determined that the principal aspect of this system would be the integration of the DAQ system with LabVIEW. This specification has the highest Technical Importance Rating because of its relationship with the quantifiable parameters that are specified in the customer requirements. The highest qualitative aspect for data collection was found to be the inclusion of the EnviroCam FS3. The results of the “How vs. How” section indicates that there may be conflicting specifications for this project. The negative correlation between components means that certain specifications may adversely affect other specifications, such as the quality of the system versus the cost. These correlations were taken into consideration throughout the entire research and development process.

Gantt Chart

In order to more efficiently manage this project, the S.E.A.L.S. team created a Gantt chart outlining all the tasks associated with this project. This chart can be found in Appendix D.

Background

Current Testing Apparatus

The dynamic friction test method Flowserve currently utilizes is on a permanent stand in their testing facility with the ability to connect to the existing environmental support system. The system circulates water at a designated pressure and temperature through the seal housing. Shown in Figure 2 to the right, there is an AC motor coupled to the drive shaft, which runs through a bearing casing with both roller and angular ball bearings that minimize the lateral and axial thrust loading on the shaft. Both the motor and the bearing case are mounted to the stand. Figure 3 below shows a closer look at the primary section of the tester. The stator is bolted in place where thin steel ribs (2) form supports with the bearing casing (1) for the seal housing. The cantilevered seal housing (locating within the pressure vessel, (3)) contains the end of the drive shaft, the mechanical seal assembly, and connections for the supplied working fluid. Sensors have been placed in the housing to monitor internal fluid temperature and pressure during operation.



Figure 2. Flowserve's existing torque tester

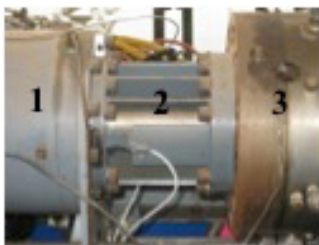


Figure 3. Close up of primary section of tester

Strain gauges are located on the supporting ribs to indirectly measure the torque on the mechanical seal. The measurement is based on the angular twist of the ribs induced by the transmission of torque through the housing from the stator. Not only does the out-of-line placement of the transducers contribute to hysteresis, the cantilevered portion creates a moment on the shaft that will encourage shaft misalignment.

The current system requires four hours for assembly and an hour to install a new seal. Assembly of the system includes the installation, testing alignment and adjustment, piping/ instrumentation, calibration, and a system warm-up.

Function, Design and Failure of Mechanical Seals

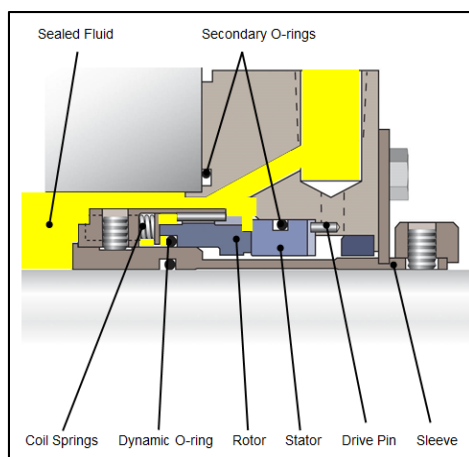


Figure 4. Diagram of mechanical seal assembly cross-section³

Mechanical seals are subsystems implemented within machines with rotating shafts, such as pumps and compressors, in order to minimize leakage where the shaft exits the housing.¹ Figure 4 illustrates the basic components of a shaft assembly with end face mechanical seals. The seal is comprised of two rings; one that is stationary (stator), and another that rotates with the shaft (rotor). The rotating component is mounted to the shaft; while the stationary component, also known as “the seat,” is mounted onto the housing.² A sealing effect takes place as the rotor spins relative to the stator. In order to decrease the amount of friction between the two, the interfaces of the seals are lapped to be extremely flat. They are kept in near contact with each other through the use of springs, but microscopically separated by a pressurized fluid.² The thin fluid film separates the rings and is the lubricant that reduces heat generation due to friction.

Significant heat generation leads to the deterioration of the seal faces and ultimately to seal failure. Typically, failure of the seal itself is recognized as seal tapering in the radial direction that leads to instability; a morphing of the seals to have uneven profiles, thus increasing leakage; the formation of deposits that impair

performance; or the formation of crystals that lead to excessive wear.⁴ These scenarios suggest that the case of failure, and therefore the lifetime of a mechanical seal, is directly related to the heat generation between the contact surfaces.⁵

The primary mechanical design considerations for mechanical seals include: tolerance stack-up in various components; wear due to friction and overheating; concentricity and perpendicularity misalignments; thermal expansion and contraction of the system; fluid properties (viscosity, specific gravity, and vapor pressure); and the dynamic effects of the relative motion.⁶

Overheating and friction occur when there is an insufficient amount of fluid film between the two surfaces.¹ Too much fluid, however, will result in a greater leakage rate. There must be a balance between the amount of lubrication and the acceptable amount of fluid leakage. System factors that influence heating such as viscosity, vapor pressure, and temperature are generally out of the design engineer's control. Manipulation of the material and the surface geometry is an alternative method for reducing friction and heat generation at the seal interface, thereby reducing the leakage rate.

Historically, hydrodynamic features were placed on seal facing, through the use of sandblasting and deformation grinding. More precise and reliable methods employing laser-etching technologies are now being utilized for the machining of micro features in the seal ring interface. Performance data taken for these seals indicate that the micro features generate a hydrodynamic lift that reduces friction by as much as fifty percent.⁶ Prior to laser-etching technology, the separation of the seals was maintained by the application of static pressure caused by the working fluid in the system. Micro-features provide a more stable lift load at the seal interface. These features also create the maximum possible film lubricant with a trivial amount of leakage.¹¹

In addition to reducing heat generation, inspection of the seal interface while in operation reveals the intriguing effects of various geometric patterns. The design of micro features helps to offset the unpredictable nature of fluid motion by guiding the fluid path. Simultaneous analysis of the dynamic friction, fluid motion, and environmental characteristics will allow for the enhancement of micro feature technology.

Existing Testing Technology

Dynamic Friction Testing

Mechanical seals operate such that the motion of the rotor relative to the stator produces a torque that is generated through the fluid film. The amount of torque experienced by the stator can be directly related to the amount of friction between the two faces. By measuring the torque experienced by the mechanical seals, a relation among the friction, the pressure gradient, and the temperature can be developed.

How Torque is Measured On Mechanical Seals

Most torque measurements include both a static torque and a dynamic torque. Static torque is defined by having zero angular acceleration, and is divided into two categories: reaction and rotary. Reaction describes the reaction torque of induced within the component. The component itself does not rotate, but a torque is induced by the rotation of another component. The induced torque will produce little to no rotation, and is often defined as a torque with less than one revolution of motion. A rotating static torque also does not include any angular acceleration, but is characterized by more than one revolution of the component under question.⁸ Dynamic torque describes the behavior of a component that is moving with angular acceleration. Dynamic torque is periodic, and can be caused by forces of gas pressure that occur in the interplay between rotary and stationary components.⁹ Thus, the fluid film within the seal has dynamic torque, which is directly related to the torque of the mechanical seals. This dynamic torque, or dynamic friction, promotes heat

generation. Heat generation and friction contribute to wear on the seal face and ultimate failure of the sealing mechanism. Furthermore, the friction that is generated between the seal faces induces a reaction torque in the stationary seal face, or stator. The reaction torque may be related back to the friction in order to gain a better understanding and analysis of the wear of mechanical seals due to friction as a function of operating conditions and micro feature geometry.

A test that isolates the effects of micro feature geometry on friction and fluid motion requires the minimization of parasitic loads and hysteresis associated with the rotary static torque. Parasitic loads include the weight of the shaft, the mounting loads, an axial thrust load (if applicable), and any components with significant rotational inertias that would dampen the dynamic torque.⁹ Ideally, an in-line torque measurement method would eliminate these effects. Another option is through an indirect solution offered by considering Newton's Third Law: for every action there is an equal and opposite reaction. As explained above, the dynamic friction between the seal faces will induce a torque in the stator and gland. Strategic placement of a reaction sensor allows for the measurement of torque by measuring the resistive force of an applied torque.¹⁰ This would be achieved by placing sensors near the pins that fix the gasket to the housing, or on the housing itself.

Different Measurement Systems

With regard to the reaction torque measurement, the most common type of sensors are the metal foil gauges through which deformation of a component is converted into a load as the resistance of the transducer's bridge circuit is increased. Excitation of the bridge by a power source allows for resistance to vary with the deformations of the component being placed under loading or torsion.¹¹ Variations in the proportional voltage drop across the foil are then translated to strain.¹⁰ Strain gauge sensors are used in Flowserve's current torque measurement system, surface mounted on the twisting I-beams between the bearing case and housing in order to measure the torque imparted on the stator (refer to Figure 5 at right). Foil gauges are often employed in dynamic environments because of the high-speed capabilities when coupled with a sufficiently large platform for data acquisition. This method, although well established, involves a certain extent of excess noise undesirable for precise measurements.¹⁰

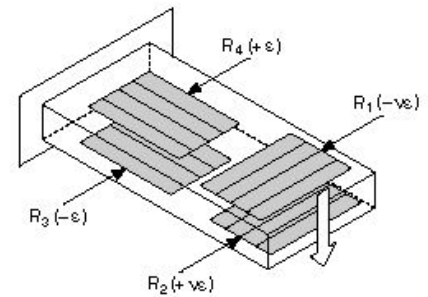


Figure 5. Schematic of full-bridge strain gauge configuration¹²

The bridge circuit utilized for measuring electrical resistances is known as the Wheatstone bridge circuit. The Wheatstone bridge consists of four arms, each with its own resistor, and is designated as being full-bridge, half-bridge, or quarter-bridge depending on the number of strain gauges used at the measuring point. A full-bridge configuration is used in stress analysis when interferences (such as parasitic loads) come into play.¹³ Elimination of the interferences is desirable for measuring the torque order to minimize hysteresis effects on the accuracy of the measurement.

In a full-bridge configuration, an excitation bridge across one diagonal is connected to a known voltage input that is then compared to the bridge output voltage that appears over a measurement bridge.¹³ Ideally, high excitation levels achieved through amplification provide a large signal-to-noise ratio that is easily measured with greater accuracy and precision, especially in the case of long wires that are susceptible to noise. However, larger excitation voltages lead to self-heating, which adversely affects the adhesive's ability to transfer strain and reducing the sensitivity of the transducer. The obvious solution is to

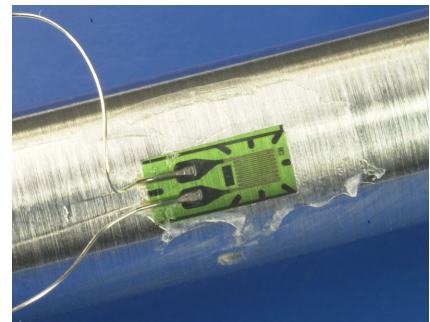


Figure 6. Example metal foil gauge transducer

decrease the excitation level in order to ensure that this does not occur. Another solution is to increase the surface area of the strain gauge. A balance between a high excitation level and the possible adverse effects must be determined in order to gain the desired accuracy of a strain gauge measurement.¹⁴ Excitation of the strain gauges means that the strain gauge had to be connected to the power source via wires that are susceptible to noise, as previously mentioned. Electrical noise contributes to lower accuracy in reaction torque analysis. Moreover, out-of-line placement of the sensor specifically contributes to the buildup of parasitic loads and hysteresis.

Another type of strain gauge available is the optical strain gauge. Optical sensing is an option that eliminates electrical noise, but is in general less accurate in its measurement. It is recommended to use a hybrid approach in order to ensure the most accurate results. Optical sensors use Fiber Bragg Grating (FBG), which consists of a series of refractory changes in the index of glass fibers that reflect specific wavelengths. A shift in wavelength is converted to strain values. The sensors are embeddable and reliable for a long period of time, and do not require a recalibration after post-installation nulling. However, optical sensors are subject to temperature effects and should be coupled with close contact FBG temperature sensors in order to monitor the environment and compensate undesired effects as needed. Although highly accurate, optical sensor transducers are extremely expensive. Additionally, they typically only allow for a measurement speed of 1 kHz, whereas foil gauges may allow for measurement speed up to 100 kHz.¹⁰

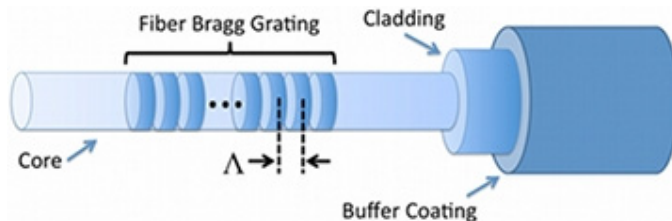


Figure 7. Diagram of embeddable optical sensor with Fiver Bragg Grating¹⁰

The sensors are embeddable and reliable for a long period of time, and do not require a recalibration after post-installation nulling. However, optical sensors are subject to temperature effects and should be coupled with close contact FBG temperature sensors in order to monitor the environment and compensate undesired effects as needed. Although highly accurate, optical sensor transducers are extremely expensive. Additionally, they typically only allow for a measurement speed of 1 kHz, whereas foil gauges may allow for measurement speed up to 100 kHz.¹⁰

Strain gauges require a certain level of signal conditioning in order to ensure accurate strain measurements. These conditioning factors are: bridge completion, amplification, filtering, offset, shunt calibration, and excitation (discussed above). Amplification is required of any configuration in order to boost the signal level to increase accuracy and improve signal-to-noise ratios. Filters are used in order to remove high-frequency noise that exists in most environments that would couple to the strain gauges and reduce the accuracy of the measurement.¹⁵ Offset nulling and shunt calibrations are discussed in the Data Acquisition section of the Background Section.

Given the structure of mechanical seals, in-line measurement is impractical. The challenge is to bring the transducers close enough to the rotating components to include a minimum amount of static torque. A typical rotary torque test utilizes slip rings that rotate with the shaft while applying power to and retrieving the signal from strain gauges through a series of brushes. Slip rings allow for a near in-line measurement, but have limited lives and are subject to wear. They are also a source of drag torque as they brush along the contact surface.⁹ The drag would introduce an unrealistic parasitic load not present in actual applications.



Figure 8. Slip ring torque meter used in conjunction with a rotating shaft¹²

In order to eliminate the need for brushes, the rotary transformer was developed. A rotary transformer is typically used for high shaft speeds but may be implemented where space is limited. The system consists of two coils, one that is static and attached to the transducer's housing and one that is rotating and attached to the transducer shaft. The induction between the two coils is converted and output as a quantifiable signal.⁸ Another non-contact method uses infrared torque sensors and a rotary transformer coupling that supplies power to a rotating sensor. A circuit on the rotating sensor provides

excitation voltage to the strain gauge and digitizes the output, then sent through infrared light to stationary receiver diodes. This method requires a source of power to be included on the rotating assembly, but outputs less noise due to the absence of wires.⁹



Figure 9. Flange mount torque transducer

Existing systems for the measurement of reaction torque are the flange mount or shaft mount torque transducers. Flanged, reaction torque sensors are designed for installation between the rotating component and the mounting plate. Shaft reaction torque sensors are commonly keyed on both sides and inserted between two shafts or the shaft and a mounting plate.¹⁶ Typically, both types of sensor include strain gauges bonded on a portion of the transducer to achieve accuracies of near or better than 0.15% full-scale-output (FSO). These systems in the current test system configuration would require the use of integral couplings in order to directly implement the sensor near the seal housing. A coupling is used to connect two shafts together at their ends for purpose of transmitting power and protecting connected equipment from misalignment, vibration and shock overload. Essentially, it would allow for the sensor to be placed between the motor and the seal housing. However, torque transducers will accommodate only a small amount of misalignment and severe misalignment would lead to premature bearing failure.⁸

Non-contact methods are of great interest due to the elimination of electrical noise or parasitic loads contributed by the traditional methods of measurement. Radio telemetry is one example that uses a wirelessly induced power to excite the strain gauge. This is a simple solution that is considered to be quite reliable and easy to install, but is more expensive than most systems. An in-line rotary system that utilizes radio telemetry consists of calibrated strain gauge torque cells inductively coupled to the stationary windings on the assembly by a rotary transformer. A secondary transformer then receives the torque signal.⁹ Although simply installed, the rotary transformer requires specialized conditioning in order to produce acceptable signals for a data acquisitioning (DAQ) system, which is a fundamental element in our system design.

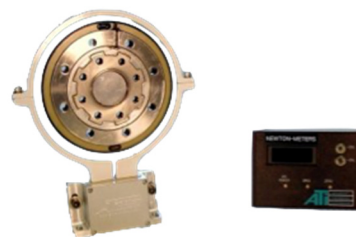


Figure 10. Radio telemetry system

Similar to radio telemetry, analog telemetry uses radio frequency technology to wirelessly transmit information such as a strain measurement for feedback analysis. In doing so, it eliminates the concern of electrical noise or misalignment of the system. Analog telemetry requires a transmitter, a receiver, a power supply (inductive or battery), a module support ring, and antennas. Originally designed for rotary applications, the stationary cylindrical antenna could be implemented for use in a modified housing design of the testing system. The use of wireless transmission of data is of great interest in the torque measurement, as it would reduce the non-linearity of the output signal.

Data Acquisition

Temperature, pressure, and dynamic friction data at the seal face will be measured simultaneously while collecting data during any testing performed. Acquisition of data will be done via National Instrument's Laboratory Virtual Instrumentation Engineering Workbench (LabVIEW)¹⁷, which is currently utilized by Flowserve at their testing facility. In addition, the operator will control motor speed using this software's system control capabilities. LabVIEW's processing unit runs parallel, which means faster acquisition and data processing. Parallel processing allows for the preservation of the phase relationship between the input signals - pressure, temperature, torque, and the operator controlled motor speed.¹⁷ The graphical user interface displays data in real time and provides a straightforward means of interpretation.¹⁸

The National Instruments' *S* and *R* Series both execute simultaneous sampling of analog inputs, and the *X* Series allows for simultaneous sampling to a lesser extent. The *S* and *R* series each provide for eight digital inputs, while the *X* contains up to thirty-two input ports. Additionally, the *X* Series Multifunction is compatible with the universal serial bus (USB). The USB is portable, and due to new NI Signal Streaming, USB devices now rival the performance expected from plug-in buses such as the PCI and PXI, which are implemented into the machine. National Instruments has enhanced performance by reducing communication overhead, and increased device responsiveness.¹⁸ In order to achieve the desired resolution and real-time analysis of the data, a greater examination of available products will be performed.

Improving the Measurement of Strain Gauges

The overall accuracy of any measurement obtained via strain gauges for the torque will be affected by the capabilities of the chosen DAQ system. There are several things to take into consideration when choosing a DAQ system. The first is data offsets; the system will output some non-zero initial value that will need to be eliminated in any ensuing measurements. In order to ensure that there is not an effective measurement loss due to large offsets for any given application, a DAQ system with a wider measurement range than needed should be chosen.

Second, the excitation stability of the source is directly proportional to the accuracy of the measurement. To minimize small excitation source fluctuation, voltage actually supplied by the source is measured in order to compensate for fluctuations. In addition, references to the measurement made by the analog digital converter (ADC) against the excitation measurement hardware itself allow the ADC to track any fluctuations in the excitation source without any software compensation or additional measurements. Many modules for purchase have software built-in for this procedure.¹⁹

Lastly, lead wire and bridge arm resistance causes a reduction in sensitivity because they have a large resistance in comparison with the bridge completion wiring within measurement system. Connecting remote-sense wires to the points where the excitation voltage wires connect to the bridge circuit will alleviate these affects. Additionally, shunt calibrations are used to simulate the input of strain by some amount of resistance. The output of the bridge is then measured and compared to the expected output voltage.¹⁹

Leakage Measurement

Mechanical seals require fluid to be present in the seal interface to provide lubrication between the seal faces. Even with the best mechanical sealing, fluid will still escape the seals. There is an inverse relationship between seal friction and fluid leakage; i.e. if there is more leakage, there is less friction because there is more lubrication.⁶ Quantifying the leakage at the seal interface over time in the test apparatus is beneficial in determining between these two. The expected leakage is on the order of an estimated 10 milliliters per hour, which raises concerns in the integrity of the sealing.³ To more simply describe this magnitude, a standardized "metric" drop of water has been defined as 1/20 milliliter, or 50 microliters.²⁰

Measurements taken more than once per hour can provide valuable information regarding various effects on the seal leakage. This information includes the effects of shaft speed, seal face temperature, and even the amount of torque on the seal interface. To make these correlations quantifiable, incorporation of the leakage measurement with the data acquisition system would be necessary. Another option to measure leakage is an electromagnetic flow meter, which measures the change in the magnetic field as fluid flows through it the component that the flow meter is attached to. These measurements would be monitored at more regular intervals than once per hour.

In order to ensure an accurate leakage measurement, all of the escaped fluid must be transported into the leakage measurement device from seal interface. This is not possible, however a method to accomplish this is to apply a superhydrophobic spray to the area. Hydrophobic materials that exist in nature are known to “self-clean” and repel anything liquid or oil based through a particular micrometer- to nanometer-scale roughness on a low surface energy material.²¹ The effect of a hydrophobic surface causes the liquid to condense to droplet form and move away from the surface.²²

A superhydrophobic surface can be synthesized through use of a two-part spray. The first step is to create a low surface energy area, which can be done with fluorocarbons or silicones. After this, the necessary roughness required can be achieved through etching, layer-by-layer and colloidal assembly, or electrochemical deposition.²¹ As a commercially available example, NeverWet has partnered with Rust-Oleum to create a simple-to-apply, two-part spray that is suitable for use on metal, wood, fiberglass, and other materials.²³

Visual Inspection

In addition to quantifiable analysis of the mechanical seals and fluid behavior, a visual understanding of the effects of surface features on fluid motion and fluid phenomena caused by high-pressure differentials in the fluid was desired as well. The EnviroCam FS3 Visual Analysis System is specially designed for integration with the original housing containing the mechanical seal. When installed as specified by the EnviroCam FS3 Visual Inspection Installation Manual, the camera lens is situated normal to the periphery of the seals so as to observe the fluid film gap. The EnviroCam F series vision systems allow for general observation of pipe surfaces through liquids or gases, corrosion/erosion observation and analysis, and particulate detection under normal operating conditions without impeding process flow.⁴

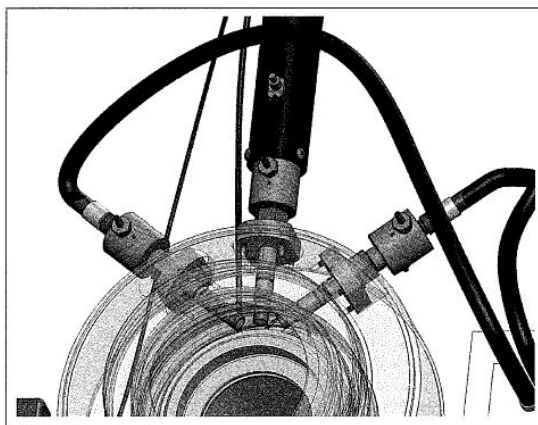


Figure 11. EnviroCam FS3.

The new system is required to situate the camera lens for inspection of the seal interface along the axis of the shaft assembly. EnviroCam offers other possible systems that may be better suited for such applications. The B series is designed for orientation normal to the seal face and has the same features of the F series as

well as bubble, particle, and turbidity analysis, multiphase detection, and process analytical technology. Enhanced analysis capabilities of the B series would lead to a better understanding of fluid phenomena associated with the micro feature technology.⁴

Design Development

Phase I: Preliminary Design

The ideas described in Phase I of the design development are included for reference and full disclosure, although most were not used in the final design of the testing system.

Concept Evaluation

Upon completion of the initial project proposal, a sufficient amount of research and a more refined problem statement was obtained in order to progress through the ideation phase. The problem at hand featured several different functions that needed to be addressed individually before integrating all of them into one system. While generating ideas for possible solutions for the presented functions of the system, it was more efficient to focus on one particular function for a period of time, and then allow for incubation of each idea while moving on to another function. Each function was then revisited for further consideration.

Several idea generation techniques were deployed in order to create a plethora of possible solutions to that function. There were a total of 88 resulting solutions for all of the design functions. The complete list of ideas can be found in Appendix A. However, a small portion of these ideas were not feasible. To eliminate based on practicality, all of the generated ideas were granted a go/no-go judgment in order to focus on fewer ideas with more potential. Small-scale models were then constructed in order to visualize the ideas, and served as visual models for inspection of the compatibility between certain function solutions and the complete system. The function models were a platform for a more detailed system concept model, which was presented to Flowserve via teleconference.

The next phase of selecting a final concept was to further narrow down the number of ideas generated through multiple team idea evaluation sessions for each function. Once each function had a small amount of possible solutions, those ideas were placed into Pugh Matrices, which can be seen in Appendix A. The matrices resulted in 3 - 5 leading concepts for each function. Detailed decision matrices were created for each function with calculated weighted criteria to determine the best concept based upon the criteria. The best result (as determined by each respective matrix) was evaluated by the team. Through discussion and justification of ideas it was determined if that was truly the best solution for the overall system.

Once a concept was determined from each of the decision matrices, those function concepts were combined to make a total system solution. Minor design changes were made to function concepts in order to make them compatible with all functions. Major function concepts such as torque measurement took precedent over relatively trivial functions such as system mobility. The next following subsections describe in detail each of the functions that are addressed in this project, with all the necessary research and reasoning for the design decision.

Table 3. Functions of Figure 12.

Function	Concept
Torque Measurement-(A)	Flange-mount reaction torque sensor
Leakage Measurement-(Not modeled)	Bending beam load cell
Pressure Vessel-(B)	Open-ended side with a clear cylinder around the seal assembly
Mobility-(Not modeled)	Keyed-leg sleeve

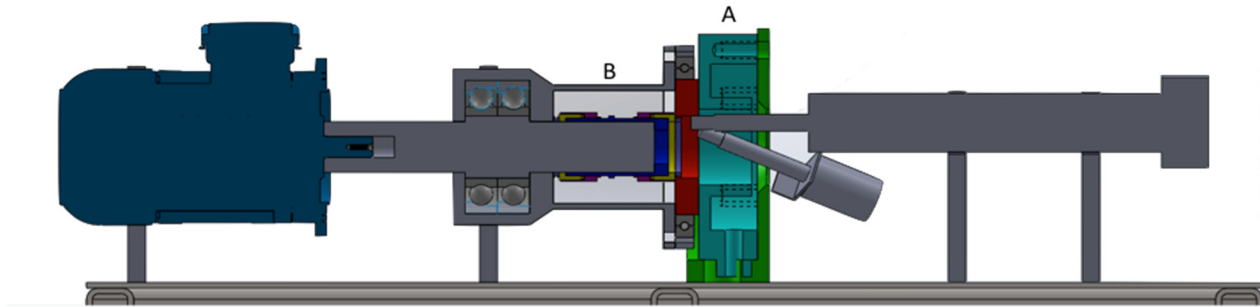


Figure 12. Section View of System Assembly

Torque Measurement

For the preliminary design proposal, an inline torque measurement would be taken between the component causing the torque and the component that the torque reaction was being inflicted on. With regard to the problem at hand, this would entail placing a sensor between the rotor and the stator. Since this is not possible, a less direct method of approach would be used. We proposed a dual-function housing that would essentially be a flange-mounted reaction torque sensor encasing the gasket of the stator.

With the existing old testing system, torque measurements are made using auxiliary calculations, which allows for the accumulation of individual errors that would not be seen while taking a direct measurement. I-beam ribs between the seal housing and the shaft have strain gauges that measure the torsion angle. The torsion angle is then used to calculate the torque experienced by the seal via the geometry of the supports and housing. This method, though effective, is subject to measurement error due to tolerances of the geometry. Temperature compensation may also be necessary in order to account for the environment that the strain gauges are subjected to. Furthermore, the indirect measurement contributes to hysteresis.

Besides the question of accuracy, the existing strain gauges require external wiring that is fairly exposed and subject to noise. The noise creation is partially due to the location of the strain gauges, but also to the inherent design and functionality of the strain gauges.

Optical sensors would completely eliminate the vulnerability of the torque measurement to electrical noise; however, optical sensors have their own drawbacks. This and other solutions for improving the accuracy and hysteresis of the measurement have been researched and analyzed by generating a decision matrix that compared five concept ideas along with the current system. A weighting scale was implemented in order to subjectively evaluate each idea based upon specified criteria. It should be noted that cost was not included in the criteria for determining the best solution due to the subjectivity to various system configurations and suppliers, as well as auxiliary components. The section following the criteria table, contains a brief description of the top concepts, with the final selection for this stage in the design phase.

Table 4. Description of Criterion used

Criteria	Weight	Description
Parasitic Effects	0.20	Refers to the severity of any parasitic loads/misalignment caused by measurement system. Systems that will add a parasitic load to the existing possibilities receive a (1). Systems that do not contribute parasitic loads receive a (5). Systems that reduce parasitic loads by providing more direct measurement than current system and also do not contribute any of their own receive a (10).
Maintenance	0.10	If routine maintenance due to wear, placement/misalignment, or calibration is involved, the measurement system receives a (1). For a medium level of maintenance, such as minor calibration, the measurement system receives a (5). If maintenance is not required save for necessary tune-ups, the system receives a (10).
Hysteresis	0.30	The accuracy due to hysteresis is determined based upon background research of each type of system and the best (lowest) percentage of inaccuracy with respect to full-scale output. Systems .25% and above receive a (1). Systems .10% and above receive a (5). Systems below 0.1% receive a (10).
Repeatability	0.20	The repeatability is determined based upon background research of each type of system and the best (lowest) percentage of inaccuracy with respect to full-scale output. Systems .05% and above receive a (1). Systems .03% and above receive a (5). Systems below 0.3% receive a (10).
Measurement Acquisition	0.10	Measurement Acquisition – This refers to the manner through which the measurement is sent to the DAQ. Systems requiring wiring from the measurement device that are primarily external receive a (1). Systems with wireless transmitters to the transducers but still with wires receive a (5). Systems with complete wireless capabilities receive a (10).
Installation	0.10	Installation – The rating for installation is as follows: A (1) indicates that the method of measurement is difficult to implement because of transducer placement. Additionally, any disassembly of the system requires the separation of the sensors/transducers from the surface on which they are mounted. A (5) indicates that the method is able to be implemented rather simply, and does not require full disassembly while performing maintenance on the system. A (10) indicates that the method of measurement would be one complete piece (transducer and sensors mounted) from the start, and not require any implementation of the sensors on the transducer by the engineers.

Alternative Concepts

Table 5. Weighted decision matrix for torque measurement system

Torque Measurement							
		Current	Optical Sensor (between gasket and housing)	Flange Mount (Housing)	Embeddable Sensor (Gasket)	Strain Gauges (Drive Pin)	Slip Ring Transformer (Housing)
	Wt.	Wtd.	Wtd.	Wtd.	Wtd.	Wtd.	Wtd.
Parasitic Effects	0.20	1.00	0.20	2.00	2.00	2.00	0.20
Maintenance	0.10	0.10	0.50	1.00	1.00	0.50	0.10
Hysteresis	0.30	1.50	3.00	3.00	3.00	1.50	3.00
Repeatability	0.20	1.00	1.00	2.00	2.00	1.00	1.00
Measurement Acquisition	0.10	0.10	0.10	0.50	1.00	0.10	0.10
Installation	0.10	0.10	0.10	1.00	1.00	0.10	0.10
Total	1.00	3.80	4.90	9.50	10.00	5.20	4.50

The highest scoring concept was the embeddable torque sensor that uses fiber optic cables. However, this method utilizes novel technology still being developed further and would be too expensive for the purposes of this project. Nevertheless, it was determined during the research stages that the capabilities of the embeddable sensor would be held as the ideal solution with specifications to aim for.

The second best concept was the use of a flange, reaction torque sensor, custom-ordered from a supplier of torque measurement systems. A typical flange sensor yields an accuracy based on hysteresis on the order of 0.1% FSO; accuracy based on linearity of 0.1% FSO; and sensitivity of 1 mV/V. Additionally, it would not require any rigorous hardware installation or maintenance while in use. However, due to the requirements of the system, any existing device would have to be modified in order to accommodate camera placement, thermocouple placement, and the placement of transparent material for a viewing window.

The third highest scoring concept was the implementation of the strain gauges on or very near the pins that hold the stator to the gasket. Strain gauge accuracy depends upon the accuracy of the DAQ device, the gauge

factor of the strain gauge, and the bridge circuit configuration. The accuracy of the DAQ is the most important factor, and is defined in terms of an offset (range) error and gain (reading) error. Offset error is constant across the full range, whereas the gain error increases as the level of the signal increases. It was assumed for the decision matrix that the reading from a strain gauge (optical or foil) would be able to reach the same level as the flange, reaction torque transducer. This assumption is based upon specifications of full-bridge strain gauge configurations mounted on the flange transducer in order to measure the strain.

Design Decision

By a large margin, a flange-mounted solution was the best choice given the selected criteria. However, taking into account the other requirements of this system, a custom-designed flange, reaction sensor with encased strain gauges was proposed. The concept was to design a component that would be pinned to the gland, indirectly experiencing the reaction torque induced by the mechanical seal. An internal torsion bar would protrude from the ring section that has the pins directing the load path to the full-bridge strain gauge configuration surface mounted to the bar. The strain gauge cables would exit the torque housing and lead directly to the DAQ module located in the table below.

This concept was very similar to the current measurement method, however, it included several features designed to minimize the hysteresis present in the system and improve the accuracy of the overall reading. First was the containment of the strain gauges and use of shorter lead wires. These are simple techniques used to reduce the noise in the reading and also reduce the effects of a longer resistive path.

Second is the direction of the load path. The torque experience by the stator travels through a pin to the gland, which in turn had a pin in the torque measurement system. This second pin would extend fully from the stator through the middle face of the torque measurement housing, into the torsion bridge. This eliminated some of the load path of the existing tester, for which the load must travel from the stator, through the pin to the gland, through the gland and the pin from the gland to the housing, and then to the beams with the strain gauges attached.

Finally, in order to account for the torque induced by the rotary action of the plug seal on the left stator, a bearing is integrated with the gland and outer housing. The bearing would serve to absorb any possible angular twist of the outer housing that is bolted from the end where the torque is being measured to the side where the plug seal is contained. Fixation of the two is needed in order to contain the pressure vessel, but is now done so in such a way to mitigate parasitic loading of the seal under consideration.

Integration with other components was a large concern regarding this method of torque measurement. Given the horizontal orientation of the overall system, as well as the necessary camera placement, the torsion bar will be hollow to allow for the camera to be inserted and reach the seal face. This also requires that the outer cylinder of the torque measurement housing have holes drilled similar to the current housing for installation of the camera strobes. The current housing incorporates leakage ports, thermocouple ports, and ventilation ports in order to properly regulate the environment within the gland that is holding the stator. There are also inlet and drainage ports for the recirculation of pressurized water into the casing. With the configuration of the entire system initially proposed, the intake and drainage ports were located on the secondary housing near the plug seal. The thermocouple port would allow for leeway to a certain extent until it reaches the gland, in order to reduce the effects of its motion relative to the torque measurement housing. Compatibility with leakage capture will be explained in further detail in the Leakage Measurement section.

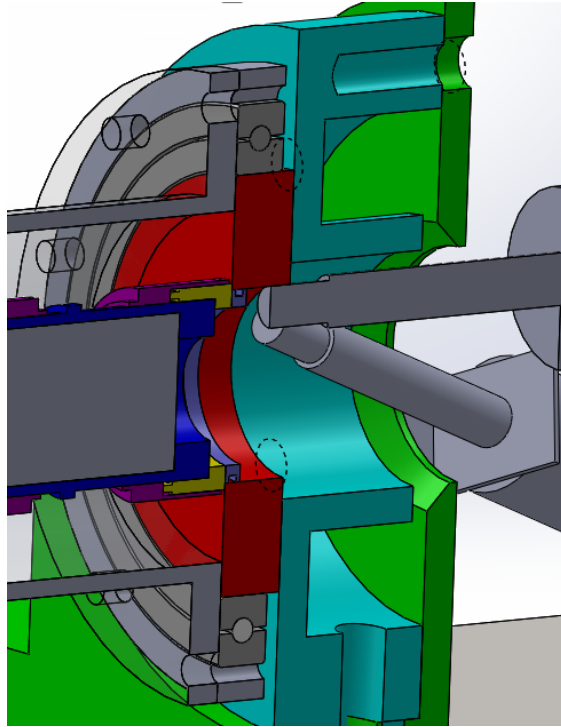


Figure 13. Torque Measurement System Integrated in System

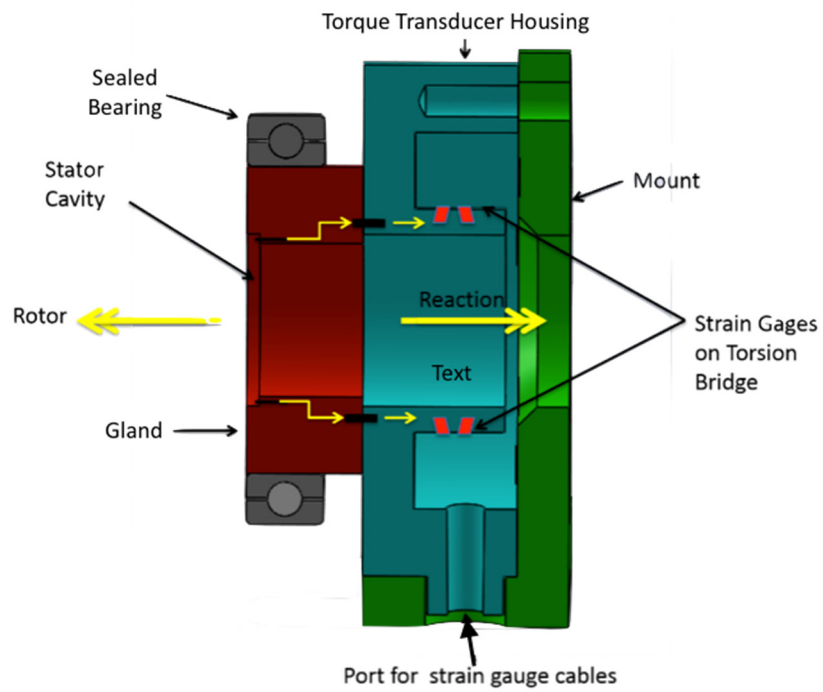


Figure 14. Annotated Section View of Isolated Torque Measurement System.

Leakage Measurement

The main function of a seal is to keep fluid from escaping the system; however, there will always be a small amount of leakage due to the nature of the seal. As referenced in the Background Research section, dynamic friction and leakage have an inverse relationship. To quantify this, a leakage measurement subsystem is needed. Obtaining a high-resolution measurement would be beneficial in order to determine the relationship between the shaft speed, torque, microfeature geometry, and leakage. The criteria for preliminary concept evaluation are in the table below.

Table 6. Description of criteria for weighted decision matrix

Criterion	Weight	Definition
Measurement Resolution	0.35	As stated in Background, a resolution of at least 0.01 mL is desired to create a semi-instantaneous measurement of the leakage to be related to shaft speed, torque, and temperature. This criterion was based on a ranking system from 1-10. Following this, the lowest ranking (0) is not meeting the requirement having a maximum resolution of 0.1 mL, (2.5) having a resolution of 0.1 mL to 0.02 mL, (5) is meeting the minimal requirement of 0.05 mL at any time, (7.5) with a resolution of 0.049 mL to 0.001 mL, and the highest (10) far exceeding this.
DAQ Output	0.27	Determined by the ease of which the method of measurement is able to connect with the DAQ. The range of this ranking starts with a zero defining no compatibility at all, a middle ranking (5) of the possibility of DAQ output with considerable labor, and the highest rating (10) being for concepts that only output with a DAQ system.
Cost	0.12	Ranked by estimated cost for entire concept solution (measurement, collection, DAQ connection, collection bracket), with the highest ranking (10) being the least expensive from 0-\$20, and ranking depreciating with estimated costs: (7.5) being \$20-\$100, (5) being \$100-\$500, (2.5) being \$500-\$1000, and (0) being anything more than that.
Assembly	0.12	Refers to how easily the system will be able to be assembled with the entire testing apparatus, with the highest score (10) requiring basic skill such as mechanically fastening the equipment down, (5) requiring machining of additional components for fastening, and (0) requiring technical attachment methods such as welding.
Versatility	0.15	Pertains to how much complexity the leakage measurement system adds to the apparatus's ability to change the seal to be tested. The highest value (10) is not having to alter the leakage measurement system for seal removal, (5) requiring minimal system removal, and (0) requiring the removal of the entire system.

Alternative Concepts

Table 7. Weighted decision matrix for leakage system

Leakage Measurement					
		Digital Scale	Bladder Elongation	Beam Load Sensor	Graduated Cylinder
	Wt.	Wtd.	Wtd.	Wtd.	Wtd.
Measurement Resolution	0.35	2.60	3.46	3.46	1.73
DAQ Output	0.27	1.35	2.69	2.69	0.00
Cost	0.12	0.87	0.58	0.58	1.15
Assembly	0.12	1.15	0.58	0.29	1.15
Versatility	0.15	1.54	0.00	0.77	0.77
Total	1.00	7.50	7.31	7.79	4.81

As referenced in the decision matrix, there were several concepts that were analyzed for leakage measurement such as: digital scale, bladder elongation, digital flowmeter, and a graduated cylinder.

The graduated cylinder solution had high ratings in the decision matrix except with regard to DAQ output compatibility. It was the least expensive idea, along with the mounting bracket concept. The assembly rating for the graduated cylinder was higher than the others because attachment of the cylinder to the bracket could be done simply and affordably. Also of note is the versatility, because the assembly and disassembly would require little effort in removing the graduated cylinder.

The digital scale concept transports the leaked fluid to a container on a digital scale with an analog output connected to the DAQ. The mass measurement is then converted to a volume measurement by relating mass and density. This concept can be modified to be compatible with a DAQ system. The scale would only require fastening to a base within the table, and did not interfere greatly with the installation process of various seals.

The bladder elongation concept included attaching a balloon-like bladder to the bracket and collecting water in it, causing it to deform under the added load. The deformation would be detected by a strain gauge

attached vertically on the bladder. This output gives a high resolution determined by the DAQ. The versatility of this idea is comparable to the graduated cylinder due to its size and assembly requirements.

Design Decision

A collection device with bending beam load cell was initially decided upon in order to properly measure the amount of fluid leaking through the seals over a given time period. A support cage was to both support and protect the load cell and fluid container during any testing, service, or movement. This concept employed the use of super-hydrophobic spray along the interior of the exposed seal face, gland, and torque measurement housing where the camera was placed in order to guide the leaked water into the collection bracket.

To obtain the leakage measurement, an assembled line of strain gauges attached to a thin, cantilevered beam would have a container attached to it, into which the leaked fluid would be diverted. The strain induced by the change in mass would be related to volume via DAQ programming. The desired resolution of 0.01 grams would be attainable with this type of a system, based on the nonlinearity value of the rated output of a typical bending beam load cell. The solution is also relatively low-cost.

Orientation of Test System

The current system used at Flowserve is supported in a horizontal fashion, with the shaft axis parallel to the floor. A reevaluation of this orientation was required in order for the performance of the previous functions to be optimized. Three orientations were considered for the system: horizontal, a vertical alignment with the seal housing on top, and a vertical alignment with the seal housing on bottom. The selection criteria for concept evaluation and the formal decision matrix for the three concepts are shown in the following table.

Table 8. Criteria for weighted decision matrix

Criteria	Weight	Description
Compatible with Leakage Measurement	0.24	Refers to ability of the design to integrate a leakage measurement system. Systems that do not allow for a leakage system receive a (1). Systems that allowed for a leakage system to be implemented received a (10).
Size	0.04	Refers to the horizontal size of the system and how much surface area the system would take in that orientation. Systems that required more space than the original test system received a (1). Systems that required the same amount of space as the original system receive a (5). Systems that required less space than the original system received a (10).
Reassembly	0.16	Refers to how easy it is for the user to install seals for different tests and reassemble the system. Orientations that cause difficulty in reassembling the system would require special tools or multiple people to reset, or can cause small hardware to be mishandled receive a (1). Orientations that minimize risk associated with hardware and allowed for reassembly by one person receive a (10).
Torque sensor compatibility	0.36	Refers to the ability of the design to include the torque sensor in the system. Orientations require extra hardware or mountings for the implementation of a torque transducer receive a (1). Orientations that allow for optimal mounting conditions of a transducer receive (10).
Camera Mounting	0.20	Orientations that require additional frame members and design considerations to make a mount receive a (1). Orientations that require fewer frame members and a high amount of design considerations (or vice versa) receive a (5). Orientations that require surface mounts rather than additional frame members, and involve fewer design considerations receive a (10).

Alternative Concepts

Table 9. Decision matrix for system orientation

System Orientation				
		Horizontal orientation of system	Vertical orientation of system with camera on top	Vertical orientation of system with camera on bottom
	Wt.	Wtd.	Wtd.	Wtd.
Allows for implementation of leakage systems	0.24	2.40	0.24	2.40
Size of system	0.04	0.04	0.40	0.40
Ease of resetting system	0.16	1.60	1.60	0.16
Torque Sensor Compatibility	0.36	3.60	3.60	3.60
Ease of camera mounting	0.20	2.00	0.20	0.20
Total	1.00	9.64	6.04	6.76

A vertical test system with the camera located on the top of the system could be a viable solution for the test system. The figure below is a sketch of this concept. This vertical orientation eliminates noise that leads to hysteresis because gravitational effects act in the radial direction. The system would also take up less floor space and have increased mobility within the facility. However, there are some critical flaws as well. It would be difficult to use existing leakage detection systems because the leakage could not be properly captured as it exits the seal radially. In addition to this, the mounting of the camera would be more complicated than the horizontal system because the camera mount would need taller supports.

For the vertical system with the camera down, the leakage detection problem would be simple to implement and the parasitic load of the shaft weight would be eliminated as well. The main issue with this system would be the assembly and disassembly for changing the seal that is being tested. Ergonomically, this concept is not efficient.

Design Decision

Based on the decision matrix above, the horizontal orientation of the system was determined to be the best design choice. A horizontal orientation would allow for leakage detection, convenient assembly of the seals, and mounting the flange mount torque tester. Horizontal orientation would

work best for reassembling the system because the engineer would be able to remove each component piece by piece, without increased risk of a components being mishandled or of small pieces like nuts and bolts falling to the ground. This orientation scores the highest because it effectively allows for the implementation of a flange torque test system due to the frame's close proximity to the components on the system. It also allows for support structures to be easily designed onto the top of the table. The figure below shows a simple model of this orientation built during the ideation phase.

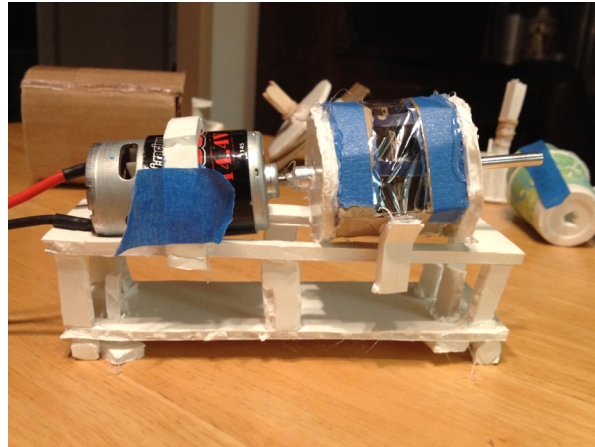


Figure 15. Simplified model of system to illustrate a horizontal orientation

Potential drawbacks created by this concept would be the amount of floor space required and the hysteresis created by a horizontal alignment. One option for reducing floor space is to design the shaft to be driven by a belt or gear system running from a motor mounted alongside the shaft. Hysteresis is caused from the parasitic load from the cantilevered shaft and sleeve in the housing. Noise is created when the shaft rotates from the weight aforementioned. However, system calibration and housing design will seek to reduce the effects of hysteresis as much as possible.

While the horizontal design is affected by hysteresis, it best allows for the optimal incorporation of all components for this testing system. As mentioned before, subsequent designs will seek to reduce hysteresis caused by the cantilevered shaft and sleeve.

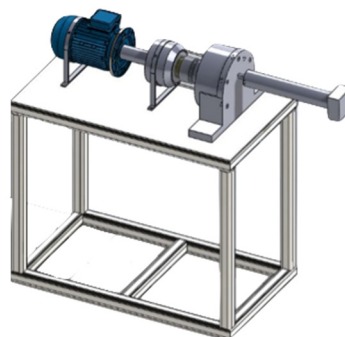


Figure 16. Design decision illustrating a horizontal orientation.

Pressure Vessel Design

Proper selection of a pressure vessel is important because it will experience various pressures and temperatures that the seals would experience in industrial settings. The pressure vessel for this system will need to incorporate a viewing window for the tester, the Envirocam, and the torque measurement system. The selection criteria utilized to evaluate each concept is found in Table 9.

Table 10. Selection criteria for pressure vessel

Criteria	Weight	Description
Reading of torque measurement	0.31	Refers to components in solutions that would affect the torque test reading and placement location for the torque test system. Solutions that generate additional parasitic loads receive a (1). Solutions that generate parasitic loads similar to the existing system a (5). Solutions that do not generate additional parasitic loads receive a (10)
Camera visibility of seal interface	0.25	Refers the ability for the design to see the seal interface. Designs with no ability for the camera to see the seal interface receive a (1). Designs with the ability to see the seal interface through material receive a (5). Designs with the ability to directly see the seal interface from above receive a (10)
Ease of assembly/disassembly	0.14	Refers to the ability for the design to be assembled and disassembled. It can be based on the number of parts used for each design. Designs with a higher number of fastening components receive a (1). Designs with a mediocre amount of fastening components receive a (5). Designs with a low amount of fastening components receive a (10)
Bearing housing design	0.03	Refers to the ease of designing for the inclusion of bearings that help against loads on the system. Systems that increased the number of bearings from the original system receive a (1). Systems that kept the same number of bearings as the original system received a (5). Systems that decreased the number of bearings required received a (10)
Manufacturability	0.08	Refers to the ability to make the parts in the design. Designs that would require CNC and other high costing manufacturing skills received a (1). Designs that required some manufacturing skills, but could be done manually received a (5). Designs that required little to no manufacturing received a (10).
Human visibility of seal interface	0.19	Refers to the ability for the seal interface to be seen with the naked eye. Designs that did not allow for human visibility of seal interface received a (1). Designs that allowed for viewing of seal interface from an angled view received a (5). Designs that allows for the direct viewing of the seal interface received a (10).

Alternative Concepts

Table 11. Weighted decision matrix for pressure vessel

Pressure Vessel							
		Open-ended Side with transparent cylinder around	Open-ended side with circular window on top	Closed system with transparent cylinder around	Closed system with circular window on top	Closed system with hole for camera and transparent cylinder around	Closed system with hole for camera and circular window on top
	Wt.	Wtd.	Wtd.	Wtd.	Wtd.	Wtd.	Wtd.
Reading of torque measurement	0.31	0.31	0.31	1.53	1.53	1.53	1.53
Camera visibility of seal interface	0.25	2.50	2.50	0.25	0.25	1.25	1.25
Ease of assembly	0.14	1.39	1.39	0.69	0.69	0.69	0.69
Bearing Housing Design	0.03	0.28	0.28	0.14	0.14	0.14	0.14
Manufacturability	0.08	0.42	0.42	0.42	0.42	0.42	0.42
Human visibility of seal interface	0.19	1.94	0.97	1.94	0.97	1.94	0.97
Total	0.81	6.83	5.86	4.97	4.00	5.97	5.00

One concept was open-ended side system, with a circular clear window on the top for the tester to see the seal interface. This idea did not receive the highest score because it would not allow for a direct view of the seal interface from above. The engineer would be required to look at the interface from an angle.

The closed system with a transparent cylinder gland is another possible solution. This idea would work well and eliminate the need for a plug seal on the other side, but it would force the torque measuring system to measure the system more indirectly. The measuring system would have to be set up on the motor side, which is near where the torque test system is on the current apparatus. The bearing house would also now require angular contact and roller bearings in order to keep the system more aligned. While the reading would be sufficient in this system, the drawbacks of this design would outweigh the benefits. This type of design would not allow for the inclusion of the camera in such a position that it can easily view the seal interface. The camera would be required to be mounted on the motor side which means it would need to cut through critical structural pieces on the motor side.

The closed system with a circular window on top represents the same concept as mentioned in the first concept described, however, the operator would not be viewing directly over the seal interface. The closed system ideas without a specific method for integrating the camera received the lowest scores on the decision matrix.

A higher scoring idea is the closed side pressure vessel concept, where the camera is partially in the pressure vessel on the stator side. This idea would be complicated because a hole would need to be drilled into the vessel and a sealing mechanism would be required for the camera. While the resolution of the photo would be improved because of the proximity to the rotor, the assembly of this system could be more complicated with additional sealing components. Once again, the circular top window failed in comparison to having a clear window all the way around the cylinder in the system.

Design Decision

Given the results of the decision matrix, the configuration initially selected was an open-ended transparent pressure vessel and dual-seal design. This design would eliminate the hydraulic thrust bearings because the seals would be on both sides of the shaft. This would also allow for a simpler bearing housing design and a more suitable orientation for the camera that promotes visibility of the seal interface. The bearing housing would theoretically only need angular contact bearings. Moreover, having a clear cylinder around the outside allows the operator to see the seal interface directly from above and the camera will be able to be placed near the seal interface without having to worry about water or other surfaces that could reflect the lights from the probes and ruin the picture. The components of this assembly would also be easy to assemble and disassemble when changing the seals, as it would not require an end cap in order to close the pressure vessel. In addition to this, it would only require taking out the torque measurement system (including mounting components), the camera, and then the seals, and then replacing those components when reinstalling seals. A major disadvantage of this system was the inclusion of a plug seal that would need to be placed on the motor side of the system. The plug seal could affect the reading of the reaction torque, which would be accounted for by the inclusion of the bearing (as stated in the preliminary torque measurement section of this report).

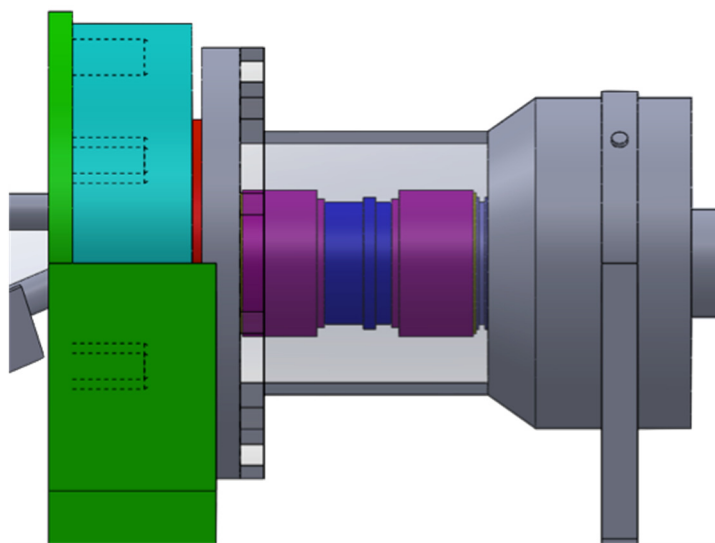


Figure 17. SolidWorks model of pressure vessel design decision

Mobility function

The final function of this system is the mobility of the testing apparatus. Currently, Flowserve's friction tester is stationary and only compatible with one support system during operation. The goal is to be able to transport the system to other locations within the facility. However, any design for a mobile system can in no way compromise its stability during testing. The table below describes the criteria used to evaluate possible solutions for the mobility subsystem.

Table 12. Criteria description for mobility function

Criterion	Weight	Definition
Cost	0.11	All concepts were weighed against the current system, which received a score of 10. A score of a (1) indicates that the concept was significantly expensive, enough to consider immediate elimination. A score of a (2.5) reveals that a concept is more expensive, but not enough for immediate elimination. If a concept is slightly more expensive, it receives a (5). If a concept is less than \$100 more expensive than the current system it will receive a (7.5)
Manufacturability	0.15	If a concept is too difficult to be manufactured for the scope of this project it receives a (1). A score of a (2.5) indicates that a concept has difficult parts to manufacture, but not too difficult to deserve elimination. Concepts with parts that can be included with a moderate amount of manufacturing time and parts, a concept receives a (5). Concepts with little manufacturing receive a (7.5). If a concept can be simply mounted with fasteners and bolts it receives a (10).
Assembly/moving time	0.22	A system that would not allow for assembly/disassembly receives a (1). A concept that would take longer than 20 minutes to assemble to system and move receives a (2.5). If a concept can be assembled and moved within 15 minutes it receives a score of (5). If a concept can be assembled and moved in 10 minutes it receives a (7.5). If under 5 minutes, it receives a (10).
Ease of mobility	0.19	This measures the strain put on the operator while moving. For maximum exertion or no mobility at all, a score of (1) is given. A score of (2.5) is given for concepts with many components that require more attention for mobility. A score of (5) is given for a concept that requires some exertion from the operator. If a concept requires little exertion from the operator, it is given a (7.5). If a concept requires no exertion it receives a (10).
Stationary while testing	0.33	A score of (1) means that a concept cannot keep the system stationary during testing. If a concept can only dampen the movement of a system during testing it will receive a (2.5). A score of (5) indicates a concept is subject to moderate vibration effects yet keeps the wheels in place. A score of (7.5) means that a concept keeps the wheels in place, and only has slight vibration effects. A score of (10) indicates a concept keeps the system stationary with no visual vibration effects.

As a result of the ideation process aforementioned, four ideas were selected for further research and team discussion: threaded rods with friction pads at four locations on the frame, hydraulic foot pegs, portable bolt locations within the facility, and keyed legs that would slide into sleeves in the floor around the testing facility. All four of these ideas would feature wheels with locking casters, as this was one of the highest scoring concepts in the preliminary Pugh Matrix (Appendix B). All four of these ideas were placed in a detailed decision matrix to determine the top concept, the keyed leg idea.

Alternative Concepts

Table 13. Weighted decision matrix for mobility function

Mobility						
		Current	Threaded rods with friction	Hydraulic foot jack	Portable Bolt locations	Keyed leg sleeve
	Wt.	Wtd.	Wtd.	Wtd.	Wtd.	Wtd.
Cost	0.11	0.83	0.55	0.11	0.55	0.55
Manufacturability	0.15	1.50	0.75	0.38	0.38	1.13
Assembly/moving time	0.22	0.22	1.10	0.55	0.55	1.65
Ease of mobility	0.19	0.19	0.95	0.95	0.48	1.43
Stationary while testing	0.33	3.30	1.65	1.65	3.30	2.48
Total	1.00	6.04	5.00	3.64	5.25	7.23

The first idea in the decision matrix is the threaded rod with a friction pad. This idea features four threaded rods, one at each corner of the frame, which would be raised and lowered when the system would need to be moved or remain stationary during testing. There would be friction pads on the end of each rod to provide stability during testing. An example of a possible friction pad can be purchased through an online source such as MSC Industrial Inc. This concept scored somewhat well in the decision matrix due to the relatively low cost given the small amount of materials needed. However, there would be the need to unthread four rods every time it was required to move or set the frame.

The second concept was a hydraulic foot peg that would fit within the frame at each corner of the system base and require less exertion to employ. This idea did not score very well in both cost and manufacturability.

Hydraulic systems tend to be very expensive, and to design our system to accommodate a hydraulic lift would not be economical.

The last idea that was not chosen is utilizing the current system's concept of bolting the frame to the facility floor. However, we expanded the concept to include multiple bolt locations that would be associated with the different support systems at Flowserve's testing facility. This idea satisfied the criterion that our system would be stationary during testing, yet versatile in testing location. It did not score very well in the ease of mobility and moving time criteria. In order to move the test system to another support connection, an operator would have to unscrew the bolts on each frame leg, then fasten those bolts to a different location.

Design Decision

The highest scoring concept from the decision matrix was the keyed leg with a sleeve in the floor of the facility. The basic premise of this solution featured legs with a peg welded on the outsides that were mounted on the bottom of the testing system frame. Once the system was in the proper location, those legs would slide into a sleeve fixed to the floor through a slot which would fix the apparatus to the floor during testing. When the operator wants to move the system, they would simply rotate the leg through the slot, and pull the leg out of the sleeve.

Assembly for Preliminary Design

All of the top concepts chosen in Phase I were integrated into a final torque test system assembly. Since accurate measurement of the torque at the seal interface is the primary function, other subsystems were designed to be compatible with the chosen torque measurement system.

There were several subsystems that required special attention in their designs moving beyond Phase I. The torque measurement system and the design of the pressure vessel with a transparent viewing window are closely related from a system integration standpoint. The different components of the torque measurement system such as the flange mount, ball bearing, and strain gauge placement were positioned in strategic places on the testing apparatus. Since the correct position of those components is paramount, the visual system had to be designed around those components. The selected final concept for the vision system utilizes transparent material in a place where no torque system components were placed so neither subsystem is compromised.

The torque system and leakage measurement system were also closely examined. The amount of fluid leaked between the seal interface and the amount of torque can be related. Therefore, these subsystems were analyzed closely so that the leakage measurement concept would not interfere with the flanged housing or bearings.

Camera placement was another subsystem that needed to be designed carefully to be compatible with the torque system. This was because the proposed concept was to externally mount the camera that would protrude into the seal housing through the flange-mount torque measurement device.

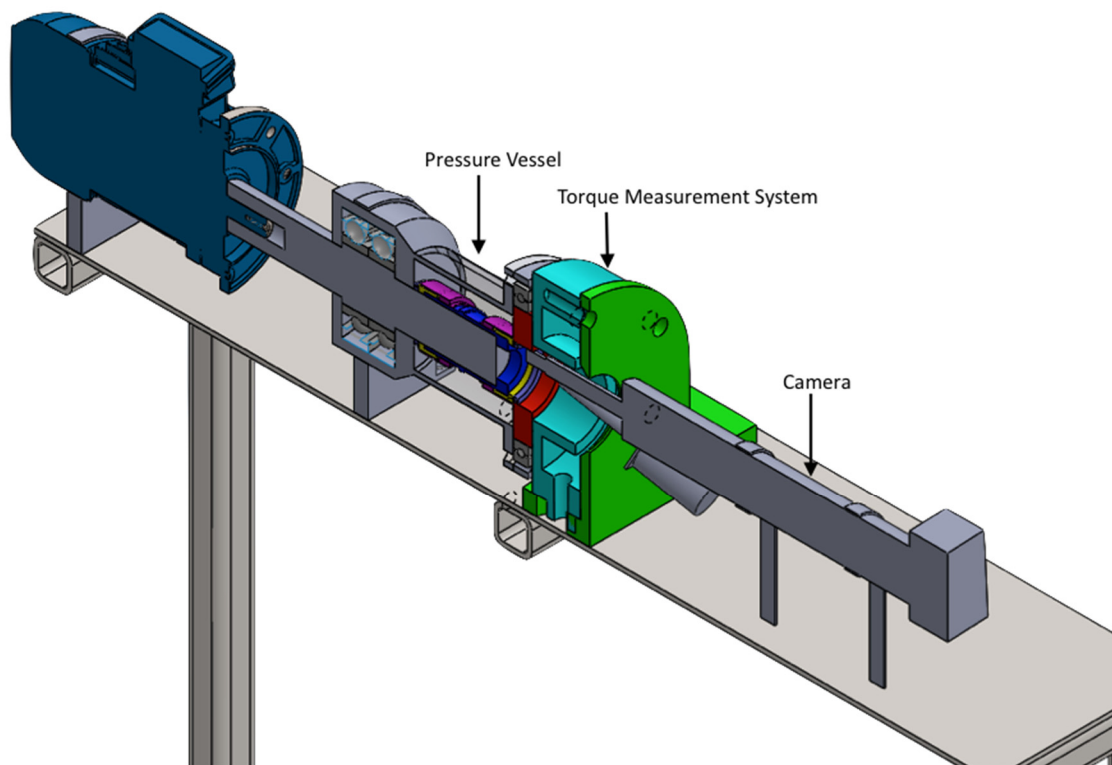


Figure 18. Isometric Section View of Complete Assembly

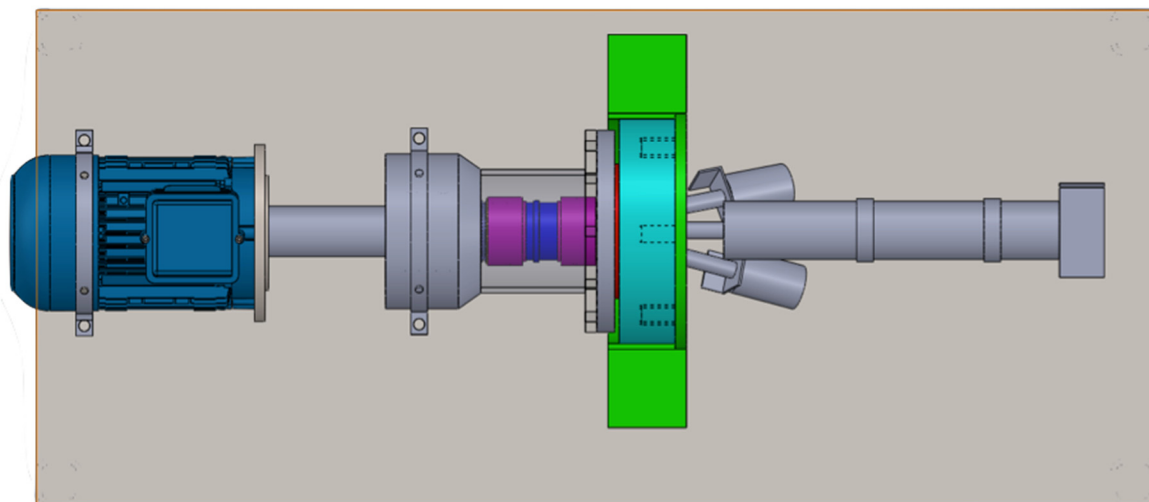


Figure 19. Top View of Assembly

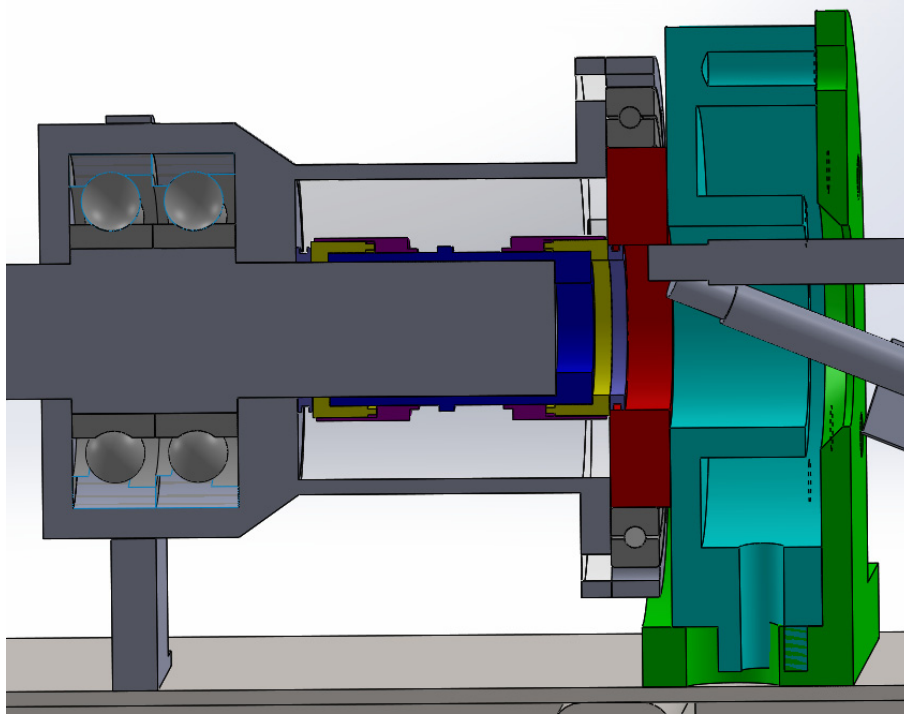


Figure 20. Main Testing Section

Phase II: Intermediary Design

Upon presenting above designs to Flowserve on March 13, 2014 and gaining approval and critical feedback, the subsystems were iterated upon and analyzed. Most subsystems dramatically changed due to added requirements and further definition of the project. One of the most dramatic changes was the pursuit of digital telemetry for torque measurement acquisition. This concept is described in the background research of this document, but was discredited early on because of the proposed budget. However, after consulting among the entire team, approval was granted to advance with this method. The resulting design changes are detailed by subsystem below.

Torque Measurement

Description

As a final concept design, a mechanically rigid coupling acts as a torque transducer for the measurement of the relative dynamic friction generated between the faces of mechanical seals. The measurement system consists of a digital telemetry collar, which is mounted on the hub of the motor side of the coupling, as demonstrated in Figure 15. The collar houses the rotating electronics necessary for transmitting a signal from strain gauges, which are mounted on the strain bars connecting the two flanges. Advanced Telemetry International (ATI) will provide the appropriate digital telemetry system, along with the necessary calibrations and set-up of the system. ATI specializes in rotating and wireless telemetry systems, and is best able to customize the necessary components for this unique application.

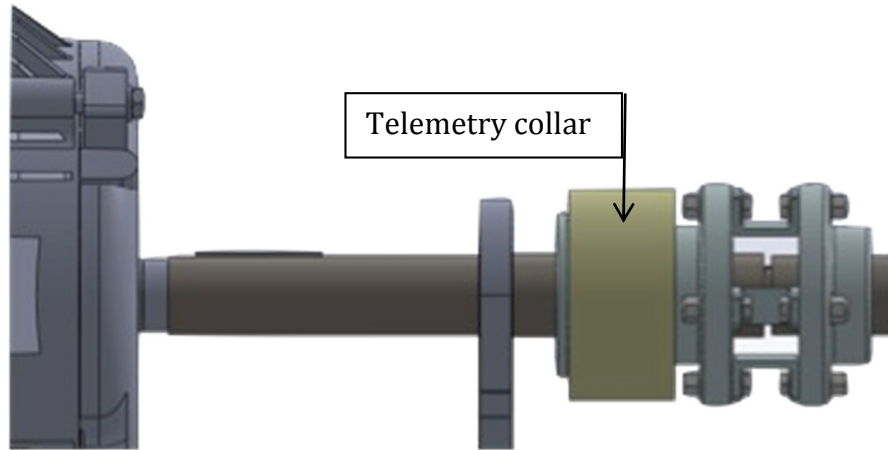


Figure 21. Coupling mounted on shaft with digital telemetry collar

Digital Telemetry

As mentioned in the background section of this report, telemetry is the wireless transmission and reception of measured quantities in order to remotely monitor system parameters. This requires a transmitter and a receiver. The transmitter consists of four basic components: the measuring instrument, which are strain gauges; the encoder, which translate the measurement into a digital signal; the modulator; and the wireless transmitter with antenna, which is a circular ring configuration that surrounds the coupling. The transmitter in this application is mounted to the coupling. The receiver also contains four basic components: the antenna, the amplifier, the demodulator, and the recording device.

Measurement

Measurement of the dynamic friction is achieved via strain gages mounted onto strain bars that span the distance between two flanged hubs of the coupling. For a typical strain measurement of a rotating part, the gauges are placed in a Wheatstone configuration. This requires four gauges to be placed a perpendicular angles from one another. For this reason, a four or eight-bar configuration was recommended by the telemetry system supplier. The strain bars at this stage were composed of 1018 Carbon steel. The main contributor in this design decision is the strength that is offered by steel versus a less rigid metal, such as aluminum. Aluminum 6061-T6-T6511 was analyzed in four- and eight-bar configurations, in addition to the four-bar steel configuration.

A general rule of thumb in design for strain measurements is to have a minimum of at least 150 – 350 micro strain. The properties of aluminum are such that the low modulus of rigidity increases the strain in the bars, as compared to a strain in a steel bar of the same cross section. The disadvantage of aluminum its lower strength, which results in a lower factor of safety regarding uncertainties at peak conditions during operation. The four-bar configuration of aluminum requires a much higher cross sectional area in order to prevent failure.

The steel 4-bar configuration provides the strength required for this system when operating normally between 1000 – 3600 rpm. The lowest calculated strain seen by the each steel bar is 75 micro strain. Although it is lower than the recommended design value, this will be sufficient for the detection of strain by the gauges.

Misalignment Considerations

Ideally, the strain gauges would only be sensing the strain caused by the torque transmitted through the coupling. In order to create a system under pure torsion, features of the shafts and the hub were modified. The system contains two shafts – a motor side and a seal side. The motor shaft originally had a step at the furthest end for mounting of a thrust bearing, over which the hollow, seal-side shaft is mounted. See Figure

16 for reference. The seal-side shaft experiences a thrust load caused by the water pressure (rated at 200 psi) contained within the pressure vessel. Designed axial play in the coupling allows the thrust to travel through the seal side shaft to the internal bearing.

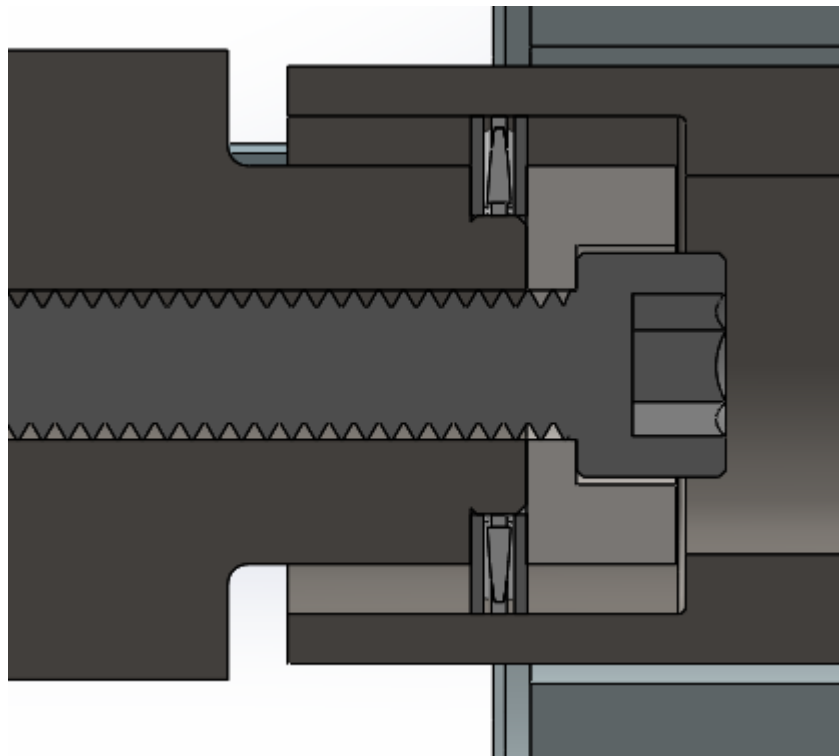


Figure 22. Internal bearing between two shafts

This axial play was achieved through the specification of a close running coupling hub fit, ISO H8/f7, specified for the hubs and shafts. Additionally, the key way was specified as an ISO N9/h9 clearance fit. Clearance fits do not provide the friction generally utilized in interference fit hubs for torque transmission. Gear couplings are a better option for axial misalignment while still transmitting the torque properly. However, these are most typically used for medium and large applications, generally exceeding 100 hp. Furthermore, flange couplings may be designed precisely enough to provide for an effective and less expensive alternative. Gear couplings require special machine equipment, have increased production costs, and are less practical for single or low quantity production.

Torque Transfer

Due to the need to transfer the complete torque through both hubs of the coupling, two keys were used on each. Shoulders on the shafts themselves would serve to assure that the axial displacement of the coupling does not exceed an acceptable amount. In addition to keyways accounting for the axial displacement, other misalignments had to be accounted for. The inherent misalignment of the shafts caused by the rotating inertias of other components required bearings mounted on either side of the coupling to absorb the motion. Typically, one bearing on either side of a rigid coupling would suffice, since this type of coupling does not allow for radial misalignment. However, with the added strain bars there are additional deformation planes that would allow radial misalignment and strain unrelated to the torque of the seal faces. For the purposes of bearing selection, the coupling was treated as a two-flex plane type flexible coupling. Thus, a four bearing system consisting of two sets of two bearings each was originally used. The use of two bearings on the seal side shaft also served to align the seals properly within the pressure vessel.

Fastening of Components

Connection of the two flanges was achieved via hex bolts and hex locknuts through clearance holes in the hub flanges and strain bar flanges. Nylon insert locknuts were utilized for vibration resistance and prevention of screw loosening. Washers were placed below the head of the bolt as well as the locknut to prevent damage to the coupling components during disassembly. A single tube with slots for reducing the cross sectional area in the region of strain gauge placement was considered. This would have reduced the number of components, effectively reducing the buildup uncertainty that leads to a lower overall reliability. However, mounting of the coupling on the shafts would have been more complicated, possibly requiring clamping forces or additional setscrews. The use of fastened-on strain bars permits a relatively straightforward assembly and disassembly. The bars also simplify the machining practices necessary for fabrication of the overall coupling, decreasing production costs.

Analysis

Couplings are rated according to critical speed, peak operating stresses, and fatigue due to normal operating stresses. Each component has been individually analyzed to account for minimum operating conditions at 1000 RPM and maximum operating conditions of 3600 RPM. Please see Appendix D for the complete calculations. Table 13 below displays the factors of safety for each component of the torque system at the peak operating condition.

Table 14. Factors of safety for torque transducer at peak operating condition.

	Factor of Safety	
Component	Critical Location Yield	Fatigue
Coupling Hubs	16.5	6.57
Strain Bars	1.43	4.56
Bolts	10	-

Pressure Vessel

Description

The pressure vessel simulates the temperature and pressure that the seals would experience under normal working conditions. The pressure vessel is designed to meet the following customer specifications:

- 200 psi MAWP
- Working fluid temperature range of 70°F to 200°F
- Ability to visually inspect seal interface
- Inclusion of EnviroCam

The subsystem during this phase was a 3-part pressure vessel with a shell and two end caps that would be bolted together. It also contained two mounts for each end of the pressure vessel that would be mounted into the table below. The pressure vessel also allows for the integration of the mechanical seals and the attachment components onto the pressure vessel. Below is a model of the pressure vessel.

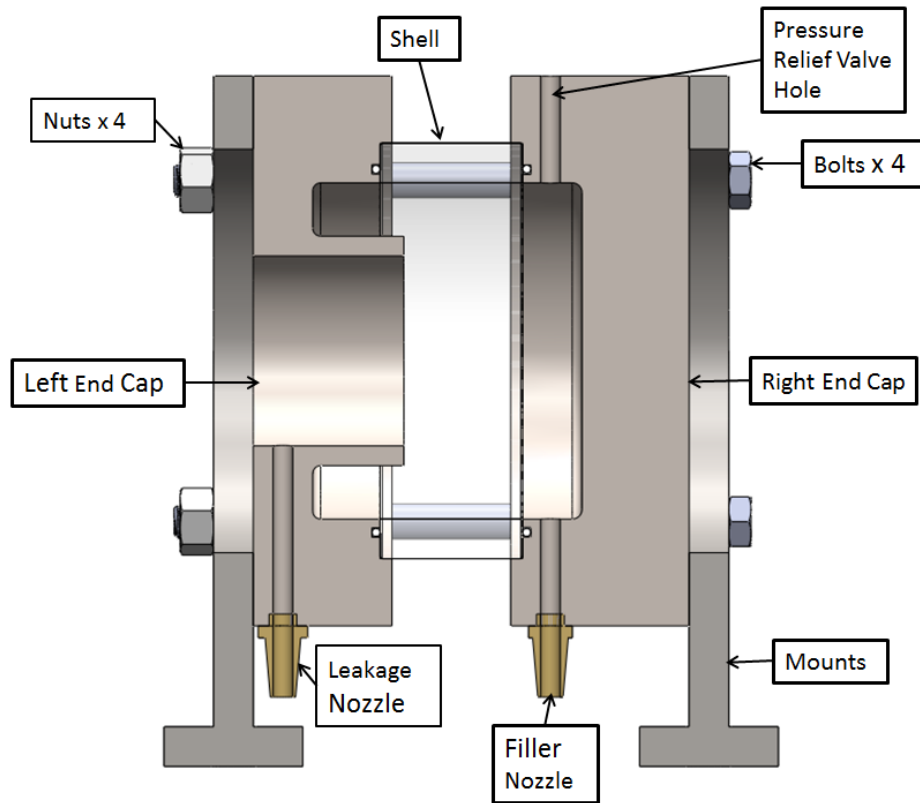


Figure 23. Section View of the Pressure Vessel System. Left refers to motor side; right refers to camera side.

Design of End Caps

The end caps of the pressure vessel would be machined from 316-stainless steel. This material was chosen because of its ability to resist corrosion well, meaning that if there was any chlorine or other chemicals in the water used in the pressure vessel used, the material would not wear down because of it. The left end cap would have been manufactured for integration of the seal assembly, thus this component was designed thicker than necessary for the rated pressure. The right end cap would be thicker walled because it needed to be able to contain the o-rings for the camera and the probes. In addition to this, where the shell is located, there would be slots placed inside in order to add o-rings to create a seal between the shell and each of the end caps. Lips were made on both end caps to hold the shell in between the two end caps. On the outer edges of the shell, 4 x 7/16 inch clearance holes would be drilled out in order to fit bolts through to hold the pressure vessel together.

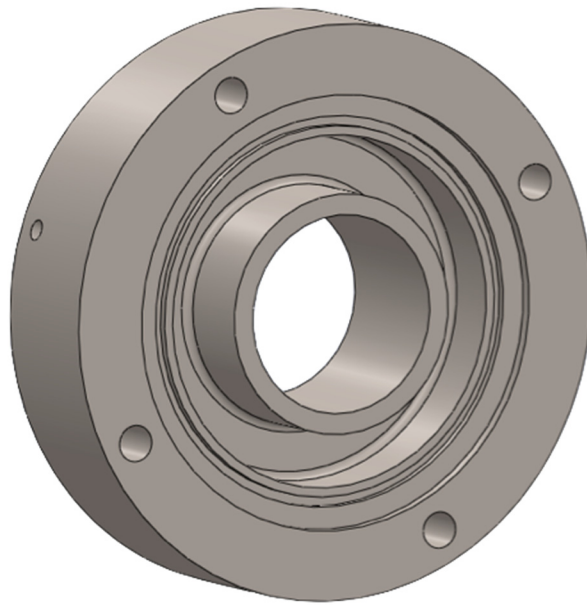


Figure 24. Left end cap: hole is for inserting shaft.

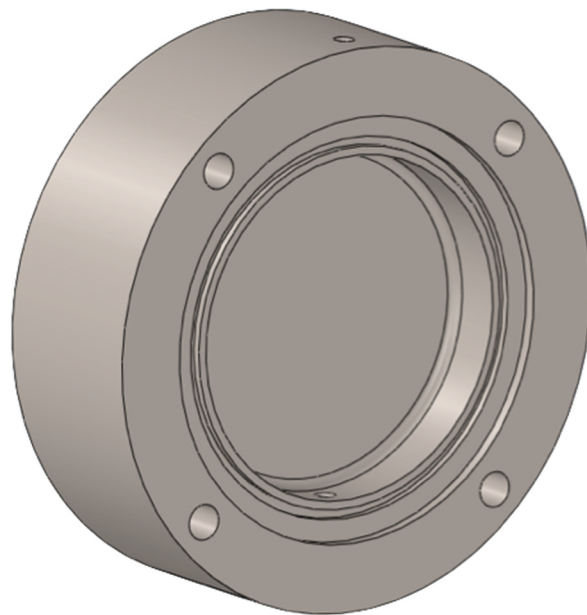


Figure 25. Right End Cap: holes for camera and probes not shown.

The stress on the end caps was calculated using thick-walled pressure vessel formulas because part of the end caps act as a shell for the pressure vessel. The radial, hoop, and longitudinal stresses were calculated and combined into a single Von Mises stress to determine the safety factor for yielding.

Fatigue was calculated using a maximum temperature of 200°F and a varying pressure between 0 psi to 200 psi MAWP. A reliability factor of 99.99% was assumed and the surface condition was considered as “machined”. In addition to this, a stress concentration value of 3 was assumed because it is considered a generally accepted value. This is to determine how many cycles it would take before the system fails. The

design criterion used for the safety factor was the ASME-Elliptic and the modified-Goodman criterion was used to determine the number of cycles the system would last.

Table 15. Analysis results for the pressure vessel end caps.

Dimensions	
d_i , inner diameter (inches)	4.25
T, thickness (inches)	1.125
d_o , outer diameter (inches)	6.5
P, Design Pressure (psi)	225
T_{min} , (°F)	70
T_{max} , Design Temperature (°F)	250
Stresses on the system	
σ_x (psi)	168.02
σ_ϕ (psi)	561.04
σ_r (psi)	-225
$\sigma_{thermal}$ (psi)	44.80
$\sigma_{th + long}$ (psi)	212.83
K_f , stress concentration	3
σ_e (psi)	682.21
Material Properties	
Yield (psi)	35,000
Tensile (psi)	85,000
Young's Modulus, E (psi)	28000
Alpha (in/in*°F)	0.00000889
Safety Factor	
Yield Safety factor	41.5317379
ASME-Elliptic Safety Factor	7.80224216
N, based off Mod-Goodman (cycles)	8.84E+09

Calculations for each of these values can be found in Appendix D.

In terms of manufacturing, machining this material is more difficult because of its ability to work harden. 316 stainless steel hardens through cold working and increases the strength of the material. Therefore, this could cause the material to become stronger as the tool is cutting through the part. This would lead to lower machining speeds and feed rates in order to not heat up the part too much.

Design of Shell

The shell of the pressure vessel was to be made from polycarbonate Lexan, and would be just under 2 inches thick. This was because the stock material sold for polycarbonate is only 2 inches thick. Polycarbonate Lexan was chosen because of its ability to bend and not break. Polycarbonate will simply deform instead of shattering if it is impacted. This was considered beneficial because it would provide more safety than a material such as acrylic, which shatters under extreme loading. In addition to this, the holes for the bolts would not be going through the material because this would increase the stress concentrations in the weaker

material. Below is a FEA model of what the stress concentrations would be if there were bolts going through the material.

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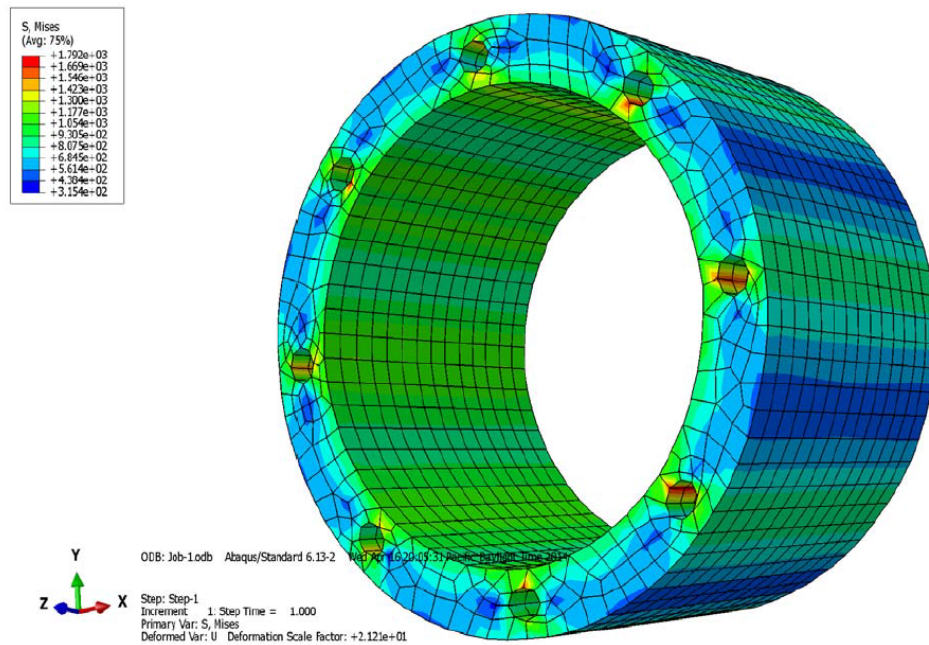


Figure 26. Abaqus analysis of bolt holes in polycarbonate pressure vessel shell.

As seen above there are stress concentrates within the bolt holes. Thus the design was changed in order to eliminate those stress concentrations.

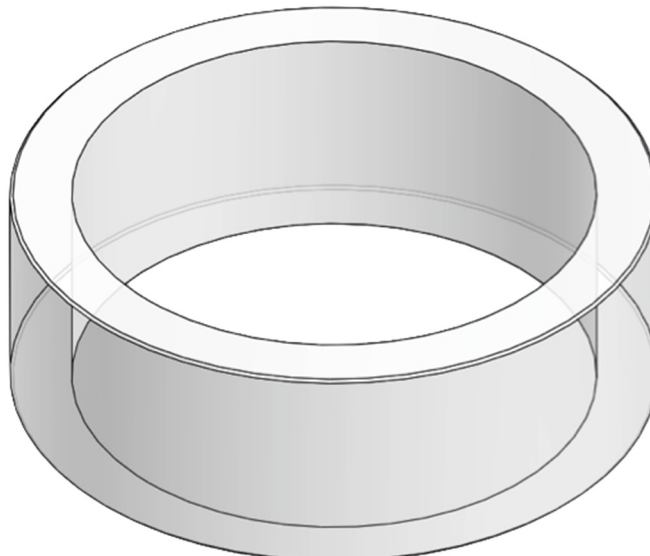


Figure 27. Final model of shell for pressure vessel.

The safety factor for yielding and fatigue for the actual shell without the holes is provided below. The design pressure was increased by 25 psi from the MAWP and the design temperature was increased by 50°F based on design suggestions from Table 1-4 in the Pressure Vessel Design Manual that references the 2010 ASME Boiler and Pressure Code. The endurance limit for the shell was found to be 1000 psi for 10^7 cycles. Using this value and other material property values, the safety factors for fatigue for 10^7 cycles was found using the ASME-Elliptic criterion. The results are shown below.

Table 16. Analysis results for pressure vessel shell.

Dimensions	
d _i , (inches)	4.25
T (inches)	0.5
d _o , (inches)	5.25
P, design pressure (psi)	225
T _{min} , (°F)	70
T _{max} , design (°F)	250
Stresses on the system	
$\sigma_{\text{longitudinal}}$, (psi)	427.7961
σ_{hoop} , (psi)	1080.592
σ_{radial} , (psi)	-225
σ_{thermal} , (psi)	-1018.16
$\sigma_{\text{thermal} + \text{longitudinal}}$, (psi)	-590.369
Material Properties	
Yield, (psi)	9,000
Ultimate, (psi)	9,500
Young's Modulus, E (psi)	377098
Alpha (in/in*°F)	0.000015
Safety Factor	
Yield Safety factor (S.F.)	5.915055
ASME-Elliptic S.F. (for 10^7 cycles)	1.306

It shall be noted that the safety factor for fatigue is 1.306, which appears low. However, this calculation is rated for 10^7 cycles. This amount of cycles exceeds the usage of this system; therefore there was not concern for the shell failing in fatigue. Calculations for this can be found in Appendix D.

Table Mounts

The table mounts were to be two sheets of welded low carbon steel. The top plate had the same bolthole pattern as the pressure vessel end caps, along with the center of the plate milled out. This was to allow the shaft to go through it on the left side and the camera and probe holes to be drilled in on the right side. On the bottom plate of each mount would be two 9/16" clearance holes in order to fit bolts through those holes and secure it to the table.

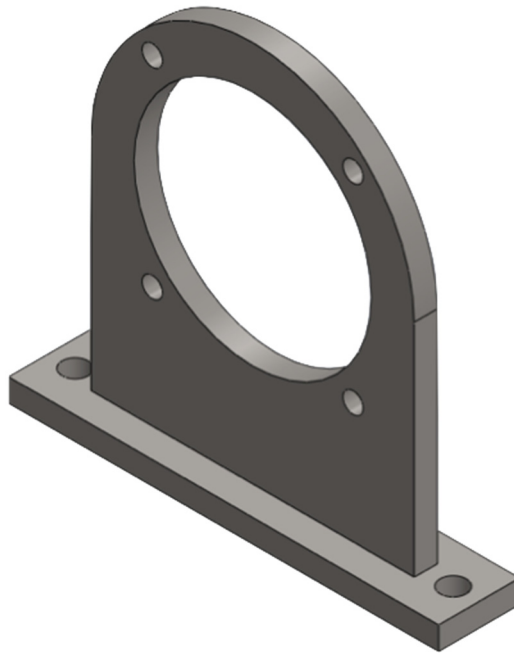


Figure 28. Mounting plate for each end cap.

EnviroCam

During this stage of the design process, it was decided that the ports for the camera and the probes provided by Flowserve would not be machined into the system. The camera was custom designed by Envirocam to be installed in a vertically orientated system to view the seals along their circumference. Therefore, the camera must be tested to determine the proper angles and distances from the seals. The test includes placing the seals on a lathe collar and the camera and probes on the carriage to test for the correct attack angle for the probes and distance from the seals to capture the best image.

Pressure Vessel Component Integration

The pressure vessel consisted of 4 bolts and nuts, 2 end caps, 1 shell, and 2 mounts with fasteners for the table. There were four 7/16 -14 UNC bolts and heavy hex nuts -ASTM A194 were used in order to fasten the shell and end caps together. These bolts would have been torqued to approximately 75 in-lbs. in order to seal the pressure vessel effectively without overdrive of the bolts. Hex nuts were used as opposed to nylon insert lock nuts because the system needs to be taken apart and put back together often with the changes in each seal. The mounts would be held onto the pressure vessel using the same bolts and mounted to the table as well using 9/16-18 bolts and nylon insert lock nuts. Lock nuts were used here because there of they vibration coming from the mobile table, and the nylon would prevent loosening. The shaft coming into the pressure vessel will be inserted in from the left side and attachment components for the seals will be made in order to mount the stator onto the left end cap and the rotor onto the end of the shaft. Two holes were drilled on the right end cap in order to filled the pressure vessel up with water and allow for the release of the air inside. The hole on the left end cap was for leakage capturing. The transparent shell would allow for the viewing of the pressure vessel and holes would eventually be added on the right end cap in order to incorporate the camera.



Figure 29. F.C. Kingston - KSV10-2-200 - Relief Valves from MSC direct. It is not modeled in the drawing.

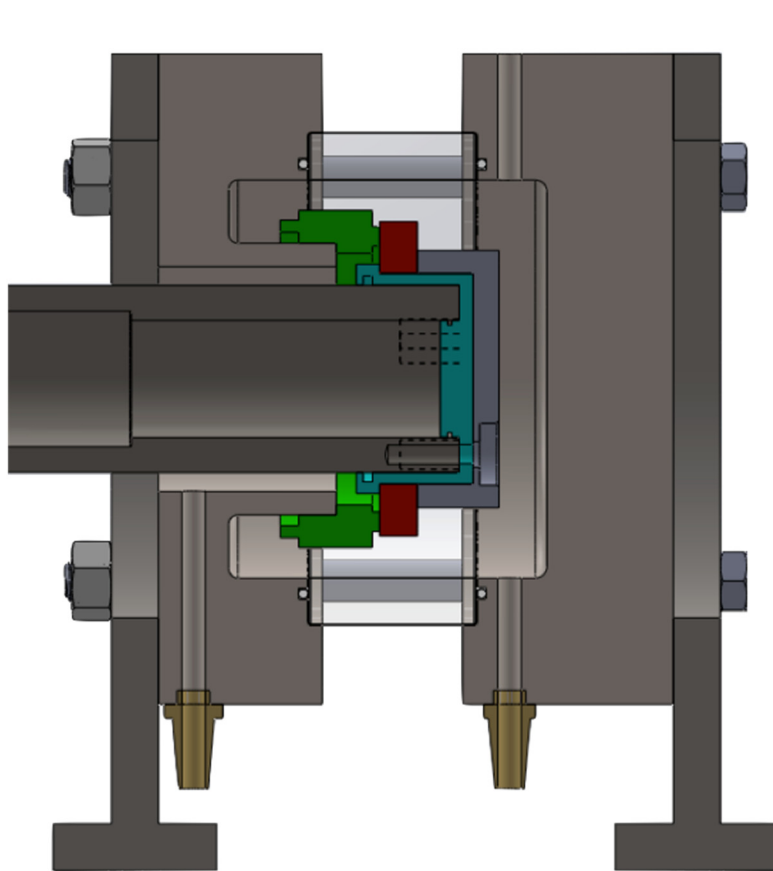


Figure 30. The green piece represents the stator and the red represents the rotor.

Leakage Measurement

The original concept defined for the Preliminary Design Report was determined to be excessive upon further consideration. This was due to the desire for a standalone system, and concerns of the container overfilling. Addressing these concerns led to a new measurement system equipped with a self-draining system. A solid model of the final concept is shown in Figure 31 below, followed by an explanation of the design choice.

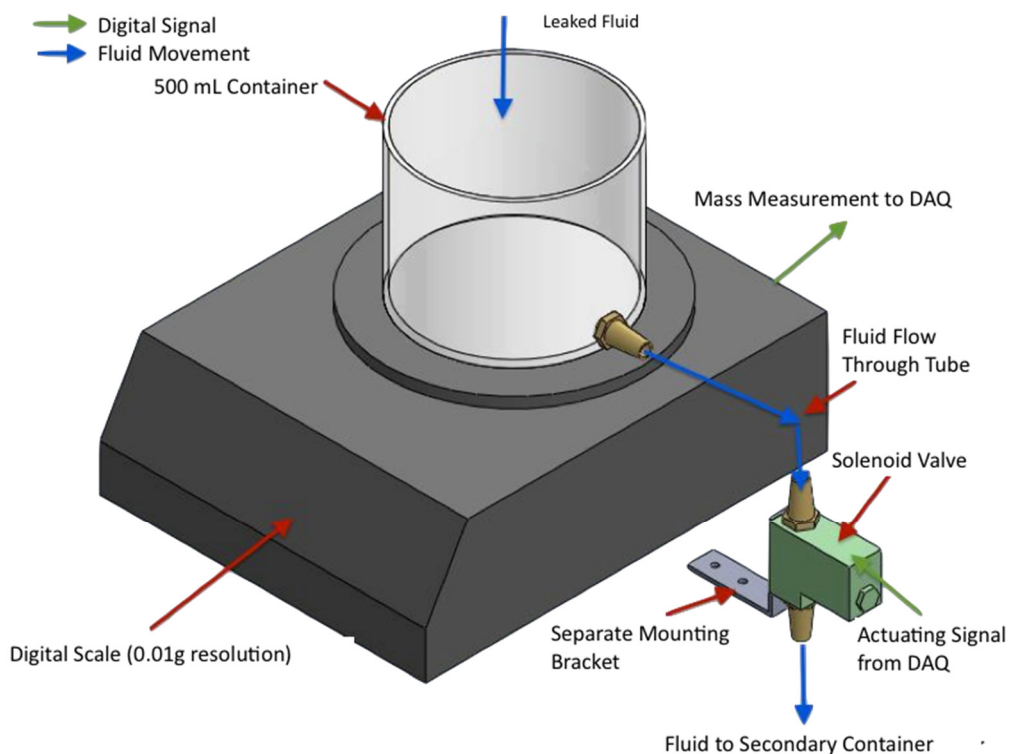


Figure 31. Detailed model of leakage measurement system.

The measurement of working fluid leaked during operation will be accomplished through a digital scale with a resolution of 0.01g that output the reading through an RS232 connection. The leakage is drained into a 500mL container mounted on the weigh plate of the scale. The measurement data is recorded by the DAQ throughout each test. A self-draining system will be implemented to protect against container over-fill. As detailed below, once a maximum safe-fill volume is reached, DAQ will actuate a solenoid valve that will empty the weighing container fluid into a secondary container until a minimum pre-fill volume is reached, at which point the valve will close again.

As modeled in the figure, the container has a barbed hose fitting attached to it, from which a clear vinyl tube spans between the container and the solenoid valve. Another fitting is placed on the outlet of the valve fitted with a tube to drain to the secondary container.

The scale will be positioned on a shelf inside the frame under a hole in the tabletop upon which the testing apparatus is mounted, below the leakage port in the pressure vessel. In order to provide a more reliable path for the leakage to drop into the container, super-hydrophobic coating will line the port.

The solenoid valve is mounted separately from the scale and container in order to avoid permanently attaching it to the scale for future maintenance. An L-bracket was to be used to mount the valve, where the valve would be attached via epoxy in the manner shown, with the inlet and outlet vertical, the inlet on top. Holes were to be drilled in the shelf where the bracket will be mounted, using small bolts and nuts through the bracket. Beneath the outlet hole for the valve would be another hole in the shelf inside the cabinet for another clear vinyl tube to attach to the fitting and lead into a secondary container, such as a bucket.

The mass measurement of the leakage is output through an RS232 cable to the DAQ where it is converted into a volumetric flow rate of the leakage through an internal code algorithm based on an assumed water density value and time measured from the beginning of the test. The mass measurement will also be used for the self-draining system. The maximum safe water volume will be found, and the mass measurement from this measurement will be calibrated into the code of a controller, which in this case will also be the DAQ. In normal testing, an output of this mass will cause the controller to send a voltage to the solenoid valve in order to open it for the fluid to drain through it out of the container on the scale to the secondary container.

To account for the mass overhanging the scale from the tube to the solenoid and the water filling it, the container will be pre-filled with water. Doing so will fill the valve and tube so that the overhanging mass will not change over the course of the container filling and will be included in the zeroing of the scale. Additionally, during the self-draining operation, the solenoid valve will be closed once the pre-fill's mass is reached and returned to the controller.

Component Selection

Each component was chosen based upon a balance between utility, versatility, and cost. With the desired resolution (0.01g) and an output port, the digital scale is the most expensive component of this subsystem. Care was taken to ensure that the output was going to be appropriate for a DAQ system, and a list of scales that had a 0.01g resolution and a RS232 port was compiled:

Table 17. Components of leakage detection system.

Scale	Limit	Price
Precision Scale BTA200	200g	\$389.00
Tree HRB 3002	3000g	\$229.95
MyWeigh iBalance 601	1000g	\$199.95

The MyWeigh iBalance 601 was chosen because of its low cost and reliability (according to user reviews) and comes with a 30-year manufacturer's warranty. It has a 1000g mass limit, which is more than enough to support the container (131g), the fitting in the container (91g), and the extreme case of 500mL (500g).

A volume of 500mL was originally chosen for this application because it would not require use of the draining system very frequently (which causes discontinuity in mass measurement during emptying). The next criteria for selection was to provide container with a wide enough mouth for capturing the seal leakage while minimizing any splash that may occur. The Nalgene Polycarbonate Straight-Side Wide Mouth Jar was chosen for its volume, geometry, and low weight.

An appropriate valve for this system would accommodate a low pressure, would be small enough to mount with the system, and would be easily compatible with the DAQ/controller. It was discovered that small electrically actuated solenoid valves were most suitable. The U.S. Solid 1/4" Electric Solenoid Valve (12V Air, Water) was chosen based on its low minimum and maximum pressures, small geometry, easy 12 volt DC power connectivity, its normally closed operation, and low cost.

A premade L-bracket was chosen for simplicity. Permanently mounting the solenoid to the bracket would allow the assembly to be mounted anywhere below the bottom of the container.

Pseudo Code for System Controller

The following code is a sample of the original logic that would be necessary to input in LabVIEW so that the leakage measurement system can perform under its design specifications:

- > Test start → Record initial mass, tare scale, start measurement recording
- > Divide mass measurement by 998.2kg/m^3 (assumed water density at 20°C – about room temperature)
- > Volumetric flow rate to different usable values – populate a table with mL/sec, mL/min, $\mu\text{L/sec}$, $\mu\text{L/min}$, etc.
- > If: $m = \text{maximum volume mass}$
 - > Then: $V_{\text{solenoid}} = 12\text{V}$
 - > Until: $m = 0.00$
 - > Then: $V_{\text{solenoid}} = 0\text{V}$
- > End
- > Stop recording at end of test

Maintenance and Repair Considerations

Maintenance of this system was intended to be minimal. At the beginning of each test, the primary container would have to be emptied and an appropriate amount of prefill water would have to be added for the scale to be calibrated properly. The secondary container will require emptying as well, and all components would need to be sufficiently dried of any excess moisture.

In terms of repair, the system was designed to have individually replaceable parts. The scale has a small possibility of failure in events such as an electrical short from water contact or excessive vibration. At such a point of failure, the scale would be sent in for repair or replacement under warranty. The other components are inexpensive enough to warrant replacement over repair.

System Frame

All components must be adequately supported by a frame that must be mobile. The mobility function is discussed in the next section. Designing a frame that properly supports all the weight is important for two main reasons: the safety of those operating the system, and the validity of the torque measurement. The total weight of all the components that will be mounted on top of the frame is approximately 320 lbs, the weight of each component can be seen in Appendix D.



Figure 32. Model of assembled cabinet.

Functional Description

The final assembly during this stage of the design with all members, casters, panels, etc. can be seen in Figure 32 above. There are many components that are assembled in this system. Individual parts can be viewed in Appendix B. The frame must be manufactured in a precise order to achieve the desired result.

The first part of this assembly to manufacture was the skeleton of the table using the structural members. Referring to Drawing #FA07, seam weld members 1, 2, and 3 around the mitered corners while they are held in place by a jig to ensure they remain square. After those are welded, member 4 was to be inserted to complete the bottom square of the frame. Next, the top of the frame would be constructed in a similar fashion to the bottom square with some additional members. Before completing the square, a tack weld would be needed in member 8 in the location annotated in Drawing #FA06. Next, tack welds for members 9 and 10 in their respective locations would be completed. The top square would then be seam welded to member 11. After the square was completed, there would members 8, 9, and 10 would be finished with vertical fillet welds.

The vertical support members could then be added to the bottom square. Referencing Drawing #FA05, members 12-15 were specified for fillet welds on the corners so that their faces were flush with the outside faces of the bottom square. Fillet welds on the top square to the top of the vertical members would again ensure that the outside faces are flat with each other. All structural members can be seen assembled in Drawing #FA04. The table would be welded to the top face of the frame by first lying a 3" fillet weld around all the corners with the table centered as shown in Drawing #FA03. The handle would then be welded to the motor side of the frame.

The caster and floor lock plates would be welded in the prescribed locations as shown in Drawing #FA02. The hinges and stay magnets would be fastened the hinges and stay magnets in the proper locations as shown in Drawing #FA02. The doors and side panels could then be fastened to the frame.

Once the frame is completed, all tabletop components would be fastened in the prescribed hole locations. The final assembly can be seen in Drawing #FA01.

Analysis

If any sort of deflection or weak point in the frame occurs, this could lead to failure of the frame's ability to withstand the weight for an extended period of time. This concern was alleviated after some simple calculations. The primary calculation was to check for the buckling of the vertical supports using Euler's

Formula for column buckling. Analysis showed that if 2"x2"x1/4" steel square tubing was used, the critical load to cause buckling is approximately 250,000 lbs. Our system will not be experiencing loads anywhere near that magnitude. Therefore, the vertical supports can easily support the weight on the top of the table without any concern of buckling occurring during the lifetime of the system.

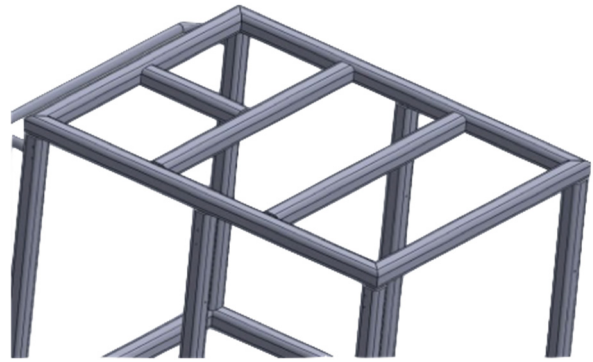


Figure 33. Critical structural bars on the top section of the table

As noted throughout this report, the primary goal of this project is to provide Flowserve with a system that can provide to most accurate measurement of the torque on the seal interfaces. In order to maintain that goal, the supporting members of a frame must be selected and assembled in a manner that would allow minimal deflection, on the order of thousandths or even ten thousandths of an inch. The figure at right shows the skeleton of the frame that would be designed for this system. As aforementioned, 2"x2"x1/4" steel square tubing is used as supports, which would be welded together. Three different members were analyzed to check for deflection. These members were modeled as simple beams using the beam deflection equation in Shigley's Mechanical Engineering Design textbook. The results are documented in the following tables showing the properties of the three segments, as well as the distributed load on each member. For the full calculation, please see Appendix D.

Table 18. Properties of frame components shown in Figure 27

Member 1					
Weight (lbs)	Length (in)	Distributed Weight (lbs/in)	I (in⁴)	E (x10⁶psi)	y_{max} (in)
321.411	30	10.714	0.912	29	- 0.00427

Member 2					
Weight (lbs)	Length (in)	Distributed Weight (lbs/in)	I (in⁴)	E (x10⁶psi)	y_{max} (in)
321.411	19	16.916	0.912	29	- 0.00109

Member 3					
Weight (lbs)	Length (in)	Distributed Weight (lbs/in)	I (in⁴)	E (x10⁶psi)	y_{max} (in)
321.411	12	26.784	0.912	29	-0.00027

Material Selection

The support members were specified as 316 S.S. square tubing. The strength of steel and its many applications in industrial environments made this the best selection for supporting and protecting the overall system. The tabletop was a 4'x4'x1/4" A36 steel plate. These two materials would be very expensive to purchase, however, Flowserve has material on site that is at our disposal for this project which would drastically reduce the cost of the frame. The casters are steel with a zinc-plated finish resting on cushioned polyurethane wheels. The weight capacity of each caster is 500 lbs. The panels enclosing the frame are 20 gauge steel 0.0359" thick. This material is the industry standard for enclosing any table or frame. It is lightweight and inexpensive, and there will be no load acting on these panels so its strength will not be called into question.

Safety Considerations

In order to ensure the safety of those operating the system and the safety of the components, the frame would have to be assembled as shown in the attached manufacturing drawings. The frame must only be used for the designed intent. Using it for any other function not specified in this report could lead to failure of the frame and/or damage to the components as well as injury to any operator. It is important to make sure that casters are unlocked and floor lock is disengaged when trying to move the frame. If any of the locks are still engaged, forced movement of the frame could result in damage to the components aforementioned or the components in the whole system.

Mobility Function

The final component of this system is the mobility of the testing apparatus. Currently, Flowserve's friction tester is stationary and only compatible with one support system during operation. The goal is to be able to transport the system to other locations within the facility. However, any design for a mobile system can in no way compromise its ability to remain stationary during testing. The table below describes the criteria used to evaluate possible solutions for the mobility subsystem.

As a result of the ideation process aforementioned, four ideas were selected for further research and team discussion: threaded rods with friction pads at four locations on the frame, hydraulic foot pegs, portable bolt locations within the facility, and keyed legs that would slide into sleeves in the floor around the testing facility. All four of these ideas would feature a caster configuration with swivel and rigid casters from McMaster-Carr as seen in the figure at right since this was one of the highest scoring concepts in the preliminary Pugh Matrix (Appendix B). All four of these ideas were placed in a detailed decision matrix to determine the top concept, the keyed leg idea.



Figure 34. Caster wheels

Further Evaluation

Even though the decision matrix pointed to the keyed leg solution as the highest scoring concept, the team did not believe this was the best option to include in the final design for this phase. The concept with friction pads was a very simple solution, however there was the issue of time needed for the operator to engage those pads. Ideally, some kind of mount or floor lock that could be activated with a foot pedal would be the best solution. McMaster-Carr supplies floor lock mounts for carts that are engaged by a foot pedal, as seen in the figure to the right. This floor lock is plate mounted to the underside of a cart or table to be placed in between the two swivel casters our table will feature.



Figure 35. Floor Lock

Design Decision

The combination of the foot pedal floor lock and caster configuration was the best concept for the team to incorporate in the final design of the mobile frame. As seen in Figure 36, the frame would feature two rigid casters on the left side, where the push handle will be located, with two swivel casters in the front to provide the ability for one operator to easily transport this frame anywhere within Flowserve's facility. This satisfies the customer requirement that this system could be used by various support systems in the testing area. The casters and floor lock are plate mounted. Mating plates would need to be manufactured for welding to the underside of the frame so the casters and floor lock can easily bolt into those plates.

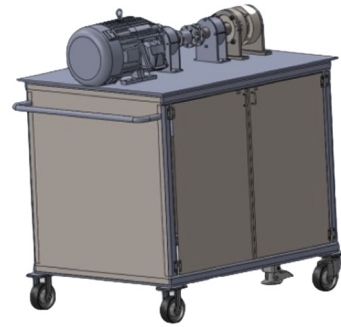


Figure 36. Cabinet with testing apparatus.

Data Acquisition System

Several of the subsystems of this project require the use of a data acquisition system (DAQ). In particular, the seal torque measurement, the measurements of the pressure and temperature inside the vessel, and measurement of the seal leakage. In the case of the leakage system as well, a controller is needed, which most data acquisition systems can serve as.

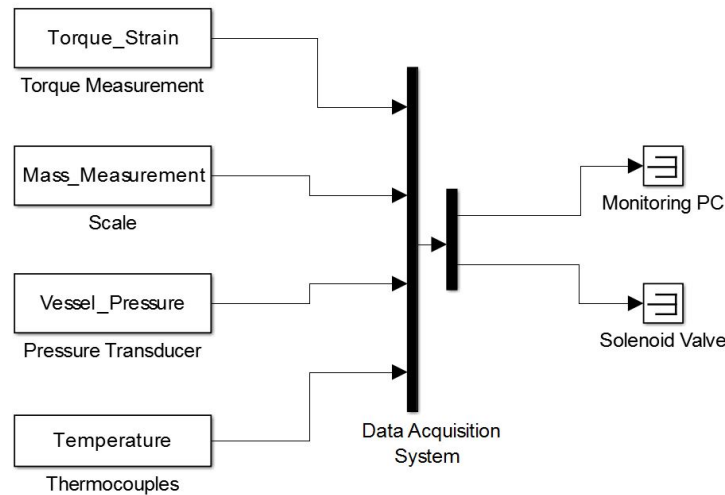


Figure 37. Simplified block diagram of DAQ setup.

The above figure shows a simplified block diagram of the inputs and outputs of the data acquisition system. There are four sources of data to be recorded as noted above, including the digital telemetry signals from the strain gauges of the torque measurement device, digital input from the scale in the leakage measurement system, and analog voltage input from the pressure transducer and the thermocouples in the vessel. There are two needed outputs from the data acquisition system, the first to the monitoring computer, which will aid in compiling the information and controlling the system, and an analog voltage output to the solenoid valve included in the leakage measurement system.

Flowserve has made several data acquisition system hardware pieces available to the team. Out of what has been offered, two separate systems can be built, one with National Instrument's Compact FieldPoint

programmable automation controller, and another with National Instrument's X-Series multi-function data acquisition. Both systems can satisfy the needs of the project. For size and hardware value reasons, the X-Series system has been chosen to integrate the project.

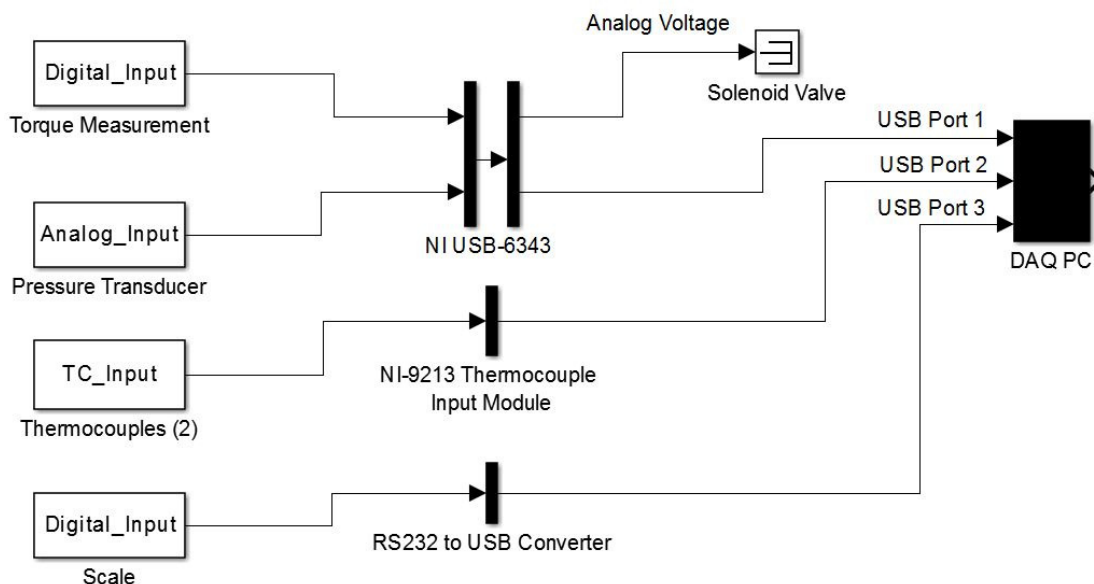


Figure 38. Wiring diagram for NI X-series DAQ setup.

The figure above is a simplified wiring diagram of the data acquisition system using the National Instruments X-Series USB hardware. As can be seen, the controller for this system is the personal computer (shown on the right), rather than the data acquisition hardware itself, as would not be the case with the Compact FieldPoint system.

The torque measurement, communicated as a digital signal, along with the vessel pressure, transmitted as an analog voltage via the vessel's pressure transducer, will be compiled by the NI USB-6343 chassis, which will then communicate both signals to the PC via Universal Serial Bus (USB). The PC will also be the controller required for the self-draining function of the leakage measurement system. When the maximum container volume is detected, an analog voltage will be sent to the solenoid valve through the USB-6343 module. All connections on the 6343 module excepting the USB output for the PC are made through screw terminals.

A separate module is required for the temperature readings output by thermocouples. In this case, a National Instruments 9213 thermocouple reading module connected to an NI USB-9162 Carrier will be used. Up to 16 thermocouples can be read by the 9213, although we will only be using two: one for measuring the temperature of the working fluid inside the pressure vessel, and the other for measuring face temperature of the mechanical seal. The USB-9162 Carrier is required for the 9213 module to convert its output to USB, which will be communicated by cable directly to the PC.

The RS232 output of the scale from the leakage measurement system is to be converted to USB output in order to be communicated to the DAQ PC. This is achieved through a cable with a converting chipset, with one end being a male RS232 serial port, and the other a USB port. An appropriate cable has been selected, based upon versatility, length, customer reviews, and cost.

All inputs to the PC will be controlled within the running environment by National Instruments LabVIEW

software. All hardware has been verified to be compatible with LabVIEW, as has the software's ability to control the entire system through both customer reviews and phone conversations with applications engineers at National Instruments.

Full System Integration

The model of the completed system is shown in Figure 33. As seen in the picture, the motor would be mounted to the table with the pressure vessel and the coupling above. Inside of the structure, there is the leakage measurement system.

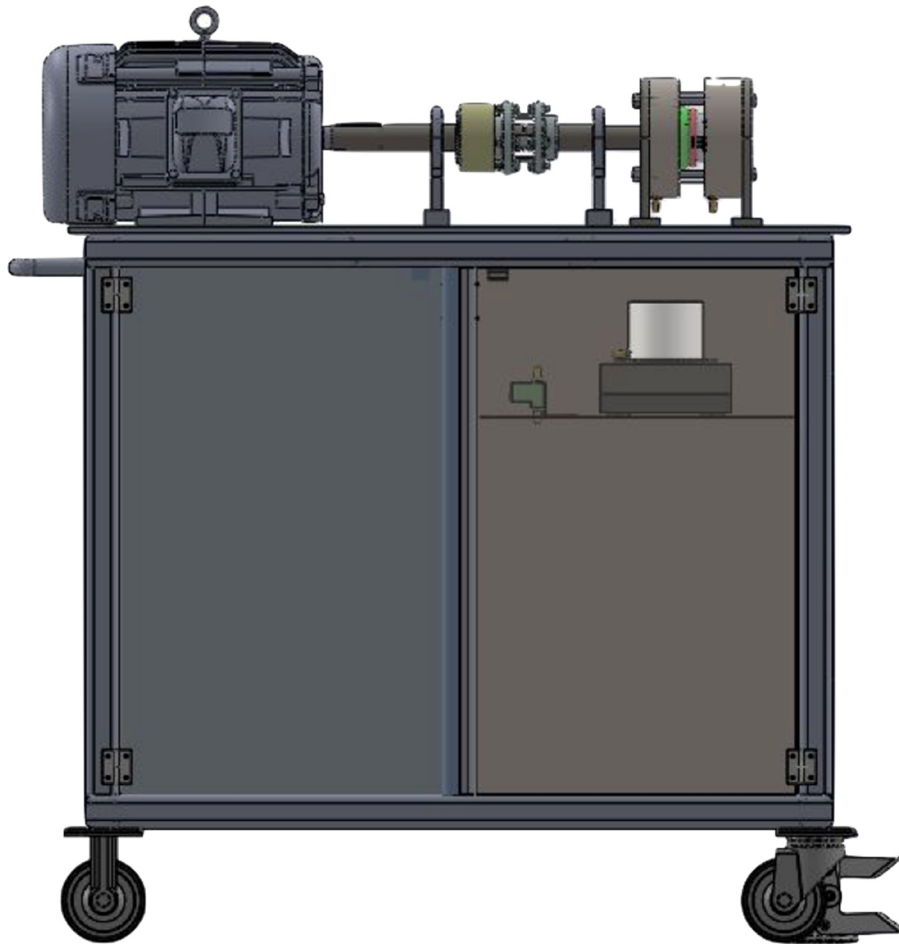


Figure 39. Front view of integrated system. The right door panel is made transparent to illustrate the placement of the leakage measurement system relative to the pressure vessel.

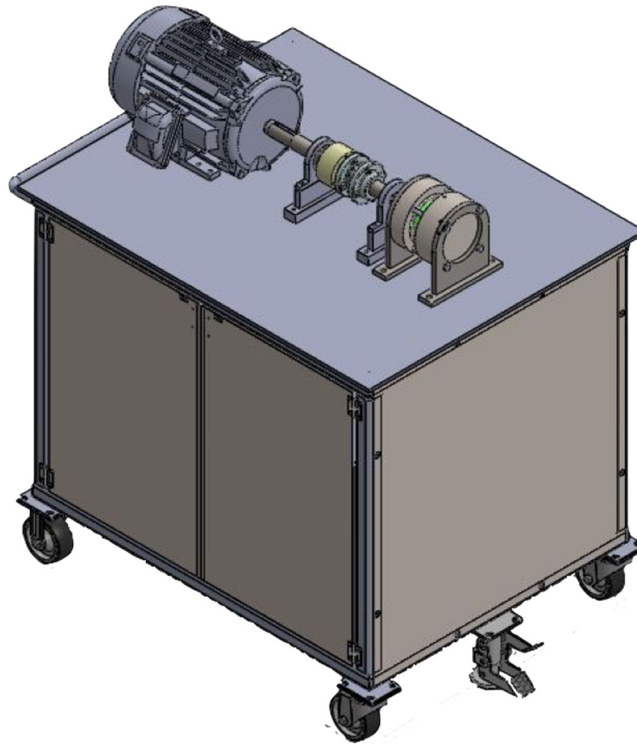


Figure 40. Isometric view of table

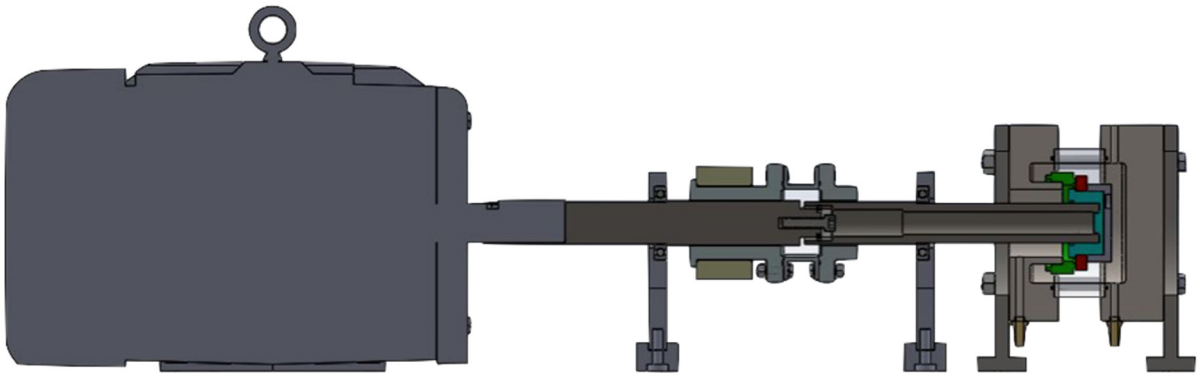


Figure 41. Cross sectional view of the top of the system

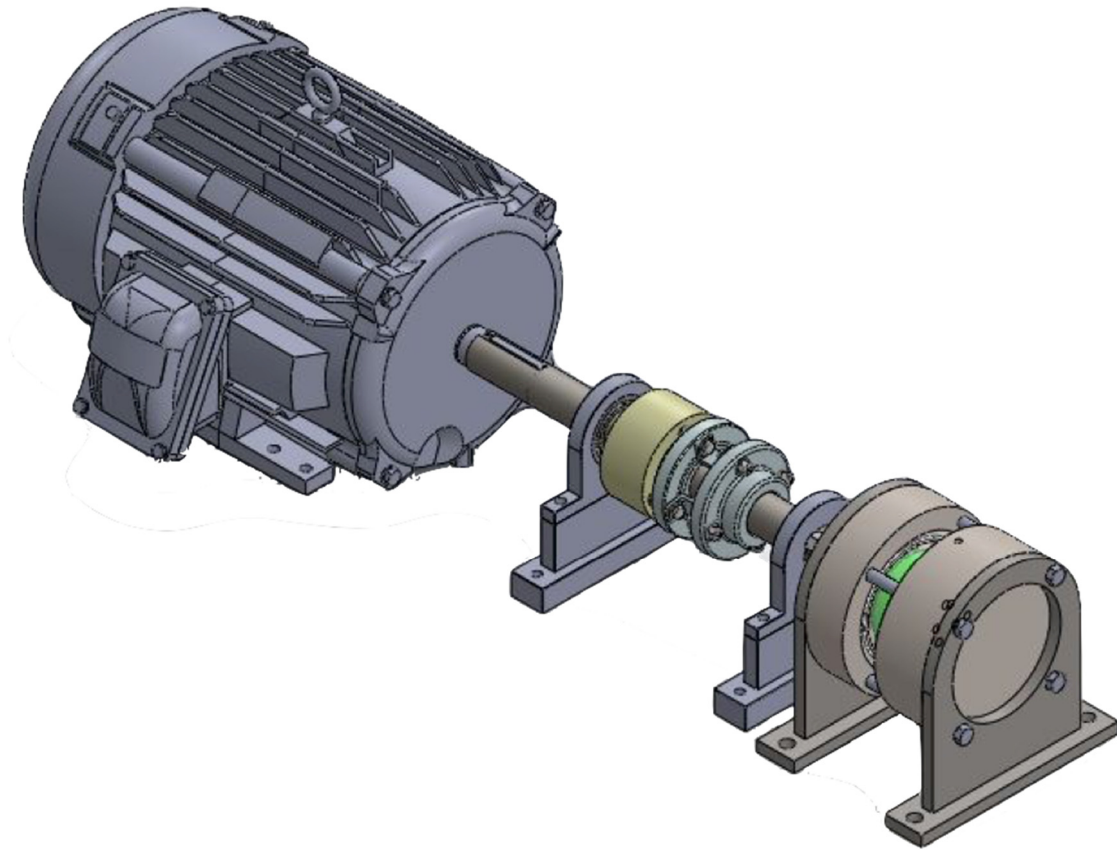


Figure 42. Isometric view of top components

Phase III: Design Changes Post-CDR

Torque Coupling

Couplings are rated according to critical speed, peak operating stresses, and fatigue due to normal operating stresses. Each component of the concept design in Figure 42 was initially analyzed without engineering software. The analysis accounted for minimum operating conditions at 1000 RPM and maximum operating conditions of 3600 RPM. Please see Appendix D for the complete calculations. The results showed that the strain bars would experience sufficient strain while the system was in operation. After further evaluation using finite element analysis with the computer program Ansys, it was discovered that an incorrect assumption was made regarding the way the bars were twisting. This led to skewed results for the strain calculation. Design changes were made to the coupling in order to remedy this error; more specifically, to the strain bars as seen in Figure 43. An exploded assembly view of the revised coupling is shown below in Figure 44.

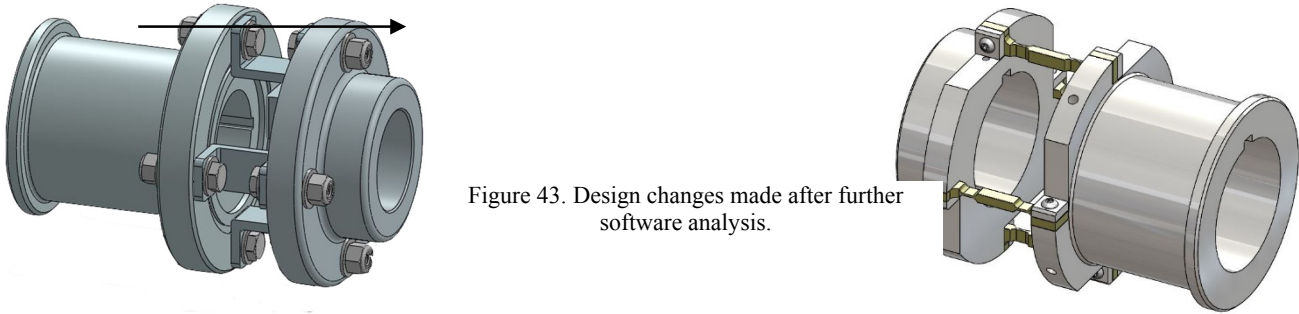


Figure 43. Design changes made after further software analysis.

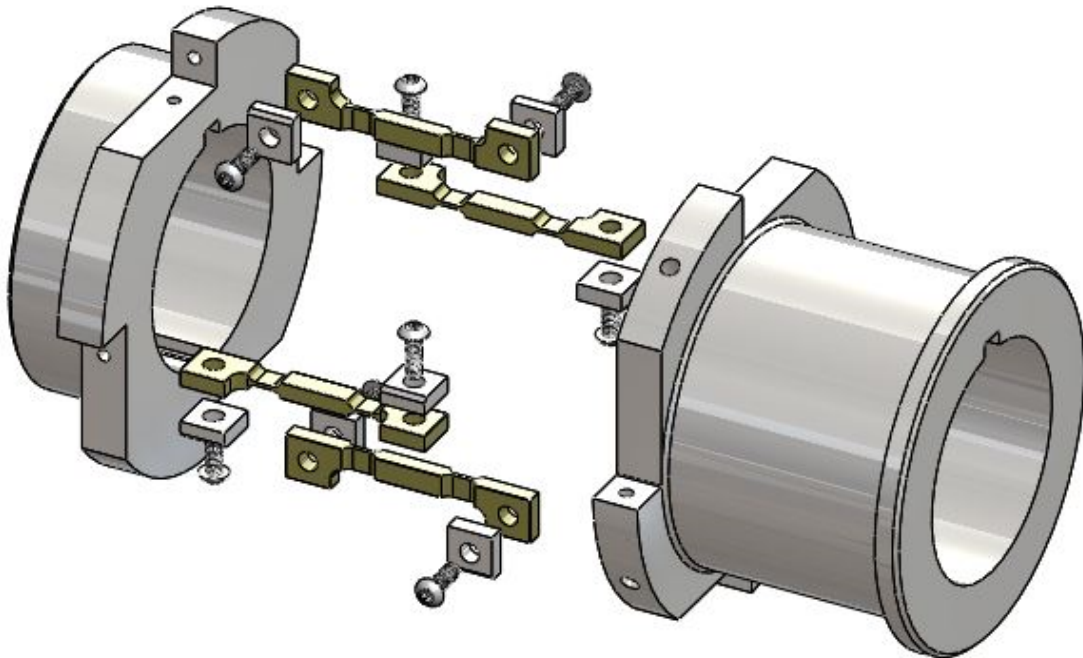


Figure 44. Exploded assembly view of modified coupling design.

The original material selected was 1018 Carbon Steel due to the need for a rigid material based upon the expected stress from the previous configuration and subsequent analysis. With the new knowledge and orientation of the strain bars, a more ductile metal was able to be selected. Grade 5 Titanium is not only capable of withstanding the operating loads, its expected equivalent elastic strain was 317 microstrain based upon a maximum load of 50 in-lb. This value falls within the range discussed previously of 150 - 350 microstrain. Thus, the strain gauges used in conjunction with the digital telemetry system are better able to detect the deformations and produce a more accurate reading. The results of the Ansys analysis for the coupling are found in Appendix E1, and the results for the strain bars are summarized in the table below.

Table 19. Results of the Ansys analysis for modified coupling

Material Data: Grade 5 Titanium Steel	
Young's Modulus, E ($\times 10^7$ psi)	1.65
Tensile Yield Strength ($\times 10^5$ psi)	1.35
Tensile Ultimate Strength ($\times 10^5$ psi)	1.55
Compressive Yield Strength ($\times 10^5$ psi)	1.35
Analysis	
Applied Torque	50 in-lb
Von Mises Stress	5.22 e4 psi
Elastic Strain	3170 in/in

The figures below show the stress concentrations and areas of most extreme strain within the coupling due to 50 in-lb of applied torque.

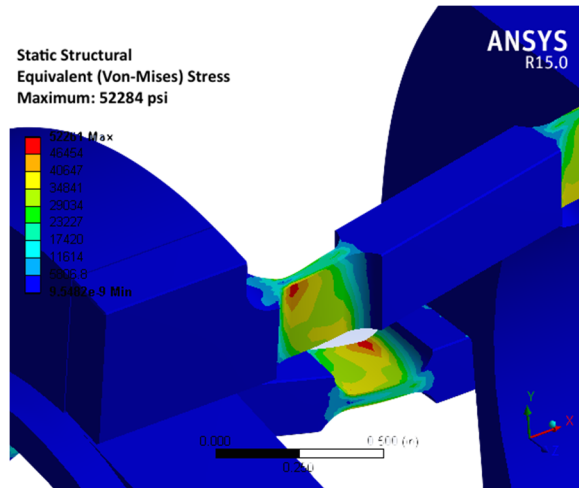


Figure 45. Stress concentration using Von-Mises stress when the coupling is subjected to 50 in-lbs. of torque

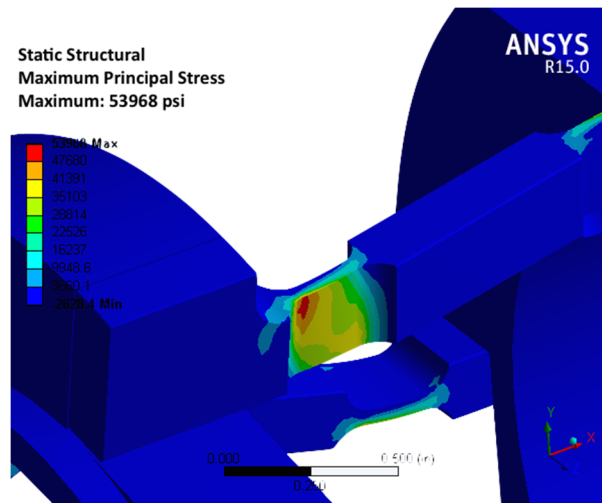


Figure 46. Stress concentration using principal stress when the coupling is subjected to 50 in-lbs. of torque

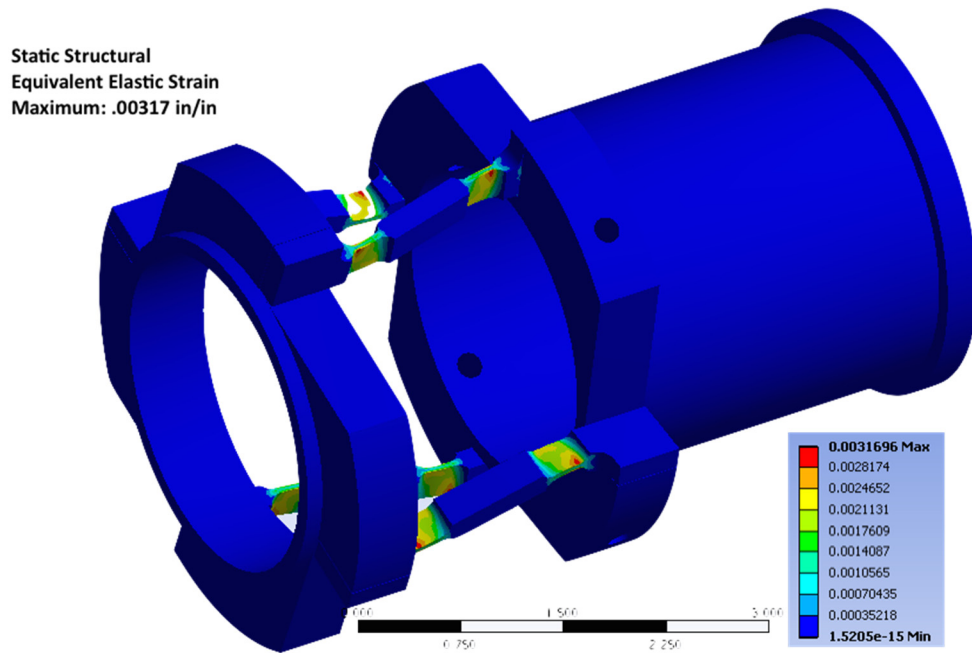


Figure 47. Strain concentrations

Pressure Vessel

The previous pressure vessel consisted of three main components: one shell made of polycarbonate Lexan and two components (referred to as glands) made of steel. The new design has eliminated the polycarbonate shell and has added in a sight glass for viewing the system. It consists of a primary gland, a secondary gland, a sight glass cover, and the sight glass. Flowserve's mechanical seal fixture components reside in the pressure vessel. The pressure vessel design was changed due to manufacturability of the component and industry standards regarding pressure vessels. After discussions within the company, Flowserve determined that it would be more prudent to go with a proven concept for the pressure vessel made of 316 stainless steel. This was decided despite calculations indicating a large factor of safety on the pressure vessel with the polycarbonate Lexan shell. In addition to that, Flowserve decided to incorporate the axial sight glass that had been previously discussed during the conceptual design phase.

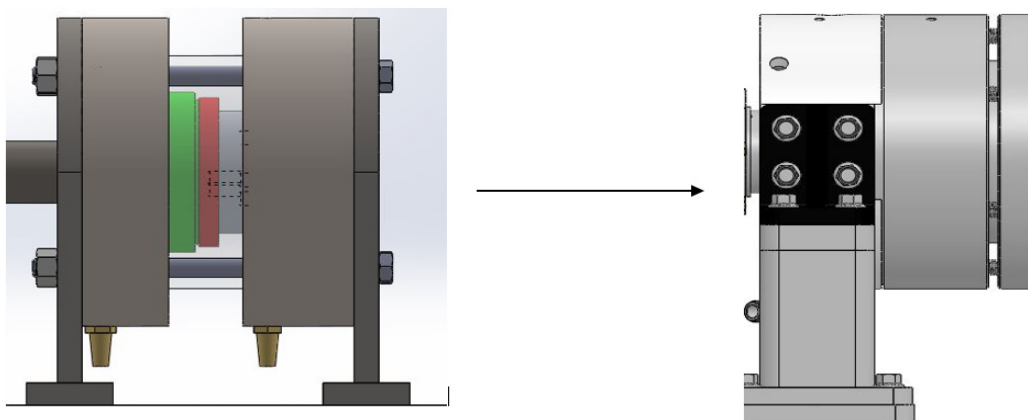


Figure 48. Pressure vessel old vs. new design

The changes reduce the length and outer diameter of the pressure vessel, allowing it to be a smaller size than when it was initially designed. The overhang of the pressure vessel is greatly reduced and the new design is safer from an ergonomic standpoint. Additionally, if Flowserve decides to use their high-speed camera from Envirocam (discussed in the preliminary design phase) they would be able to easily modify the secondary gland to accommodate for this.

The mounting of the pressure vessel is done with the same pillow block mounts concept as previously discussed. The design consists of square tubing and a machined L-bracket to be bolted into leveled the sides of the primary gland.

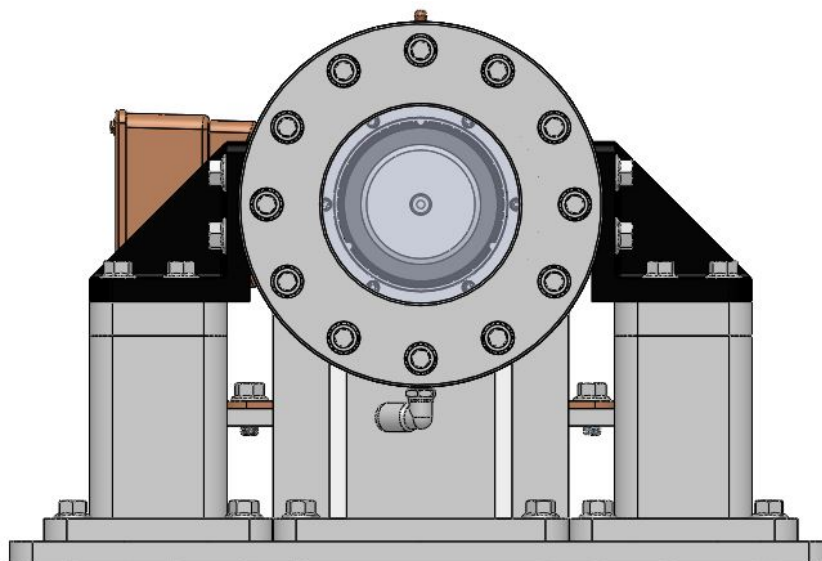


Figure 49. Modified pressure vessel design

In order to incorporate the new design, quantitative analysis was performed for each of the components. The calculations were completed through use of Flowserve's pre-programmed Microsoft Excel spreadsheets for analyzing pressure vessels. The spreadsheets use Roark's formulas for stress and strain (These same equations were used in the previous pressure vessel analysis). The material properties used for the calculation are from the Aerospace Specification Metals Material Data Sheet. The maximum combined shear stress found on the thinnest outer wall (Primary Gland) using the thick walled cylinder stress calculations were found to be only 474 psi, which is well below the yield stress for 316 stainless steel of 42,100 psi. In addition to this, endplate calculations made on the thinnest section (Primary Gland) was found to have a safety factor of 10.1. Bolts used on this pressure vessel were the same as the ones presented during Phase II of the design development. However, due to Flowserve's industrial safety standards, 6 bolts will be used instead of 4. Calculations regarding all of these components can be found in Appendix E.

The Primary Gland consists of 6 bolting holes for the secondary gland. It also contains an inlet port (at the top) and an outlet port (at the bottom) for water to cycle through the system. Another hole is also made external of the pressurized section in order to capture the leakage from the system.

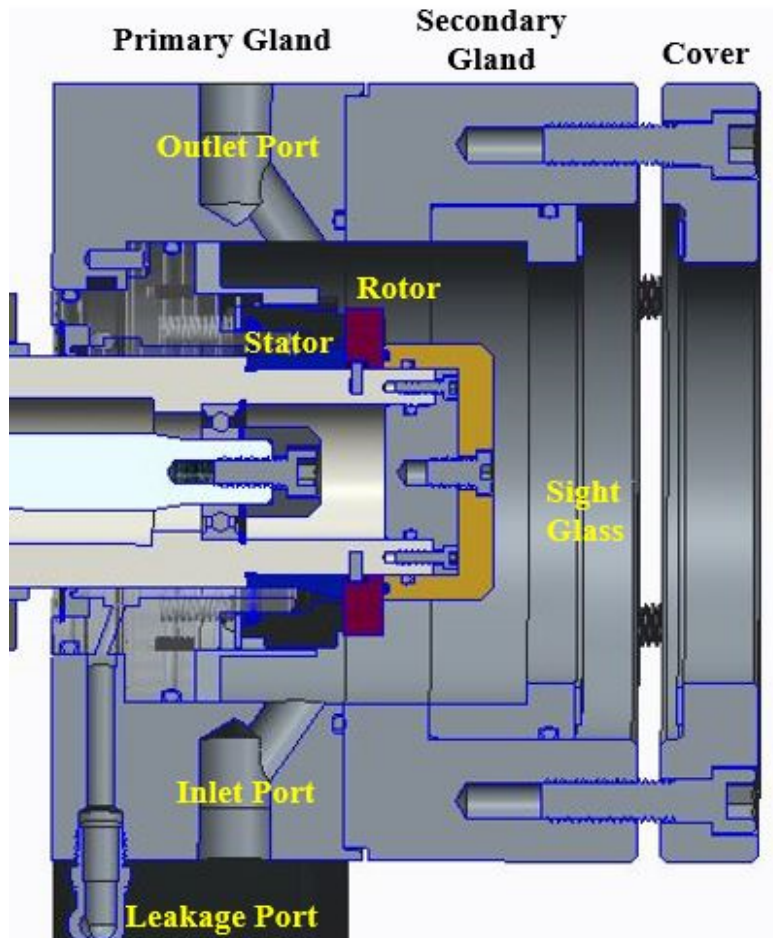


Figure 50. Labeled section view of the internal pressure vessel and seal assembly

Structure and Supports

The structural supports of all of the components were redesigned during this final phase of the design development. External bearings on the motor side shaft and internal bearings on the seal side shaft were necessary. The primary goal of the external bearing was to reduce noise and friction torque while providing angular guidance, preventing misalignment. The internal bearing arrangement serves to reduce the thrust on the coupling from the pressure vessel, ultimately reducing noise in the torque measurement. After extensive research and consideration on the many types of bearing and their applications, a configuration was decided upon. The bearing housing support assembly mounts to the base plate and the ends of the housing. Pillow mounts support the pressure vessel via a flat surface along two sides of the circumference. These configurations can be seen in the figures below.

Ansys finite element analysis was performed on the structural components supporting both the bearing housing and the pressure vessel. The results are listed in the table below, and the figures provide a visual depiction of the stress and strain. The design of the supports was determined to be adequate based upon the material properties of carbon steel.

Table 20. Results from analysis on structures and supports for bearing casing and pressure vessel

Material Data: Structural (Carbon) Steel	
Young's Modulus ($\times 10^7$ psi)	2.90
Tensile Yield Strength ($\times 10^5$ psi)	3.63
Tensile Ultimate Strength ($\times 10^5$ psi)	6.67
Compressive Yield Strength ($\times 10^5$ psi)	3.63
Analysis	
Applied Load (lbs.)	1600
Pressure Vessel	
Von Mises Stress ($\times 10^4$ psi)	1.20
Total Deformation (in/in)	.00126
Pressure Vessel	
Von Mises Stress ($\times 10^3$ psi)	4.52
Directional Deformation, x (in)	.003323

Static Structural
Equivalent (von-Mises) Stress
Maximum: 11.9 ksi

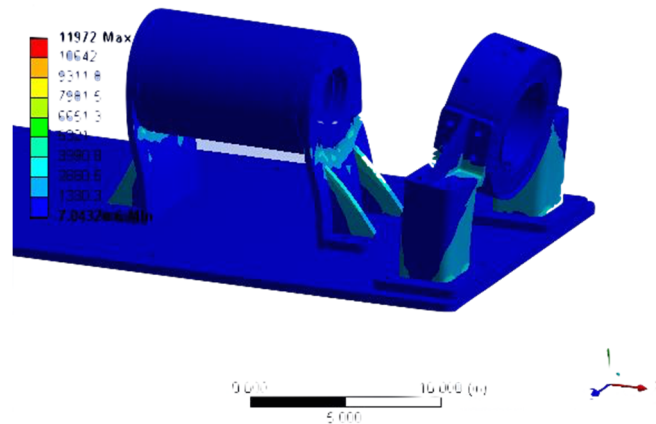


Figure 51. Equivalent (von-Mises) stress acting on bearing casing and pressure vessel when subjected to the maximum load the

bearing housing and pressure vessel.

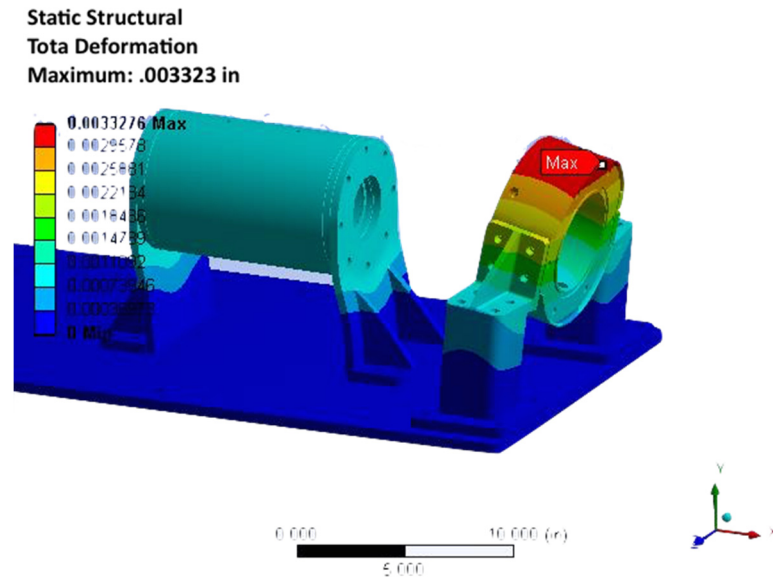


Figure 52. Total bearing casing and pressure vessel deformation when loaded in the same case as in figure 51.

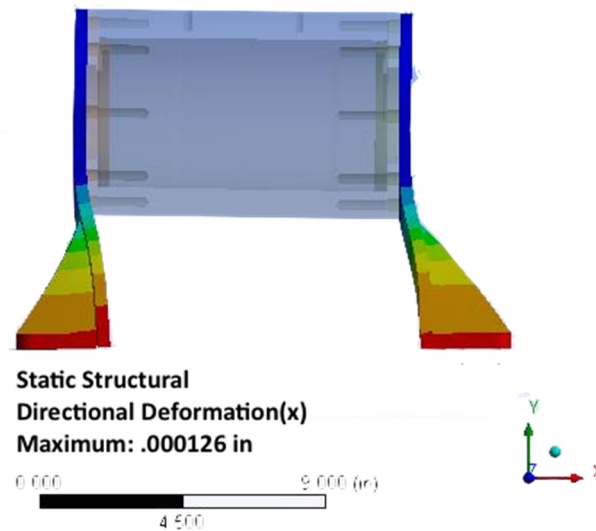


Figure 53. Bearing casing mount deformation when casing is loaded in $-x$ direction on the right side. The casing has been made

transparent for this figure

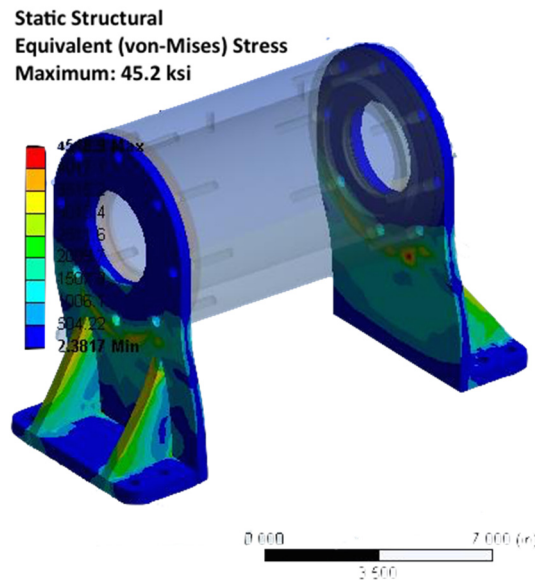


Figure 54. Bearing casing equivalent stress. Loading case is the same as figure 53. Case has been made transparent in this figure

Leakage Measurement

The leakage measurement system underwent several design changes, but the concept remained unchanged as well as a few of the components. The MyWeigh iBalance m601 digital scale was purchased and is used in the final system. The solenoid valve is also being utilized.

However, the valve was moved up to the scale's weigh-plate in order to minimize the hose length and the overhung weight on the scale. In order to implement this, a plastic male-male threaded pipe connector was purchased. This will replace the threaded hose barb in the beaker, and the solenoid valve is to be threaded into it on the opposite side.

Concerns were expressed regarding the trigger for the draining function. It was decided that depending on the mass measurement output from the scale for this trigger could prove unreliable. Thus, a secondary triggering device was needed. Two options were considered that would fit the need for the system: float

levels and optical sensors. The float level switches use buoyancy to create the event: the charged magnet floats upward within an enclosing cylinder upon water reaching it, and the change in the voltage induced triggers the switch. The optical sensor functions via a photo-transistor trigger, or photodiode, which converts light into small amounts of current; when the amount of light that the sensor is subject to is changed, the current (which is detected by the data acquisition system) changes and triggers a switch within the control logic of the system. While cheaper, the float level was too large for system constraints. Therefore, an optical sensor was chosen. A Honeywell LLE101000 is shown in Figure 54.



Figure 55. Optical sensor from Honeywell

The polycarbonate material was inappropriate for machining purposes. To accommodate the necessary modifications of the container and as well as the incorrectly sized weigh plate of the digital scale (which proved too small for the beaker and solenoid valve), a holding plate was also designed. In order to minimize corrosive effects from the water, the materials of both are 6061 aluminum. The material chosen is also light

enough to avoid reaching the maximum weight limit of the scale. The holding cylinder is now 5 inches tall and has an internal volume of approximately 550mL. There are machined and tapped holes for the both the optical sensor and the threaded pipe for the solenoid valve connection. Two holding plates were initially designed: one of machined Delrin and the other of sheet metal with 90 degree tabs, both holding position of the holding tank and solenoid valve on the weigh plate. Because of ease of machining and access to a sheet metal laser cutter, the sheet metal option was chosen.

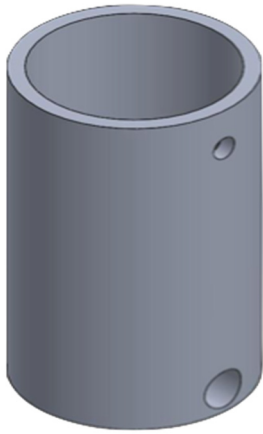


Figure 56. Modified Cylinder

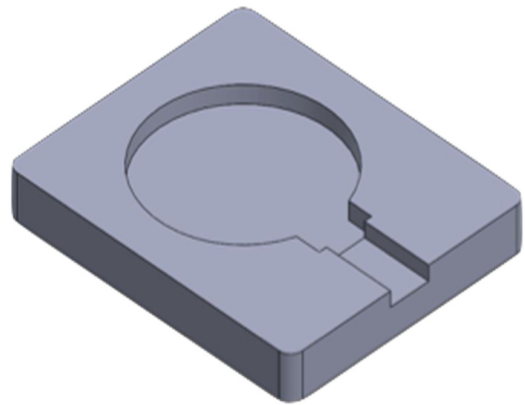


Figure 57. Delrin mount plate

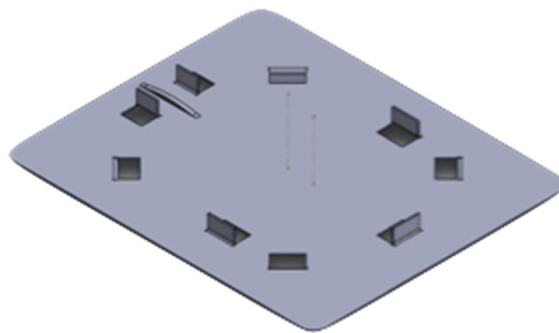


Figure 58. Sheet metal mount plate.

Motor

The motor was changed from a 5 hp motor to a 7.5 hp motor. This change was made to allow for an increase in the horsepower needed to drive the seals. It allows for a more versatile test system, allowing the system to test various types of micro features created on the seals. The selected 7.5hp Baldor motor is shown below in Figure 58.



Figure 59. Baldor 7.5hp motor.

Table

Rather than purchasing material for the table frame and spending time and money on labor building frame, it was decided to purchase an industrial cart to serve as a base support for the testing system. The cart selected is a Jamco 3 Shelf Reinforced Mobile Table 24" x 36" and is rated for 4800 lbs. The rating on the table is much greater than the weight of the system that will be placed on it.



Figure 60. Jamco industrial table from Global Industries.

Description of Final Design

Overall Description and Layout

After implementing all of the design changes described above, a finalized model was created. Figure 60 below is a section view of the whole system. Figure 61 is a quarter-cut section view to illustrate the placement of the seal assembly.

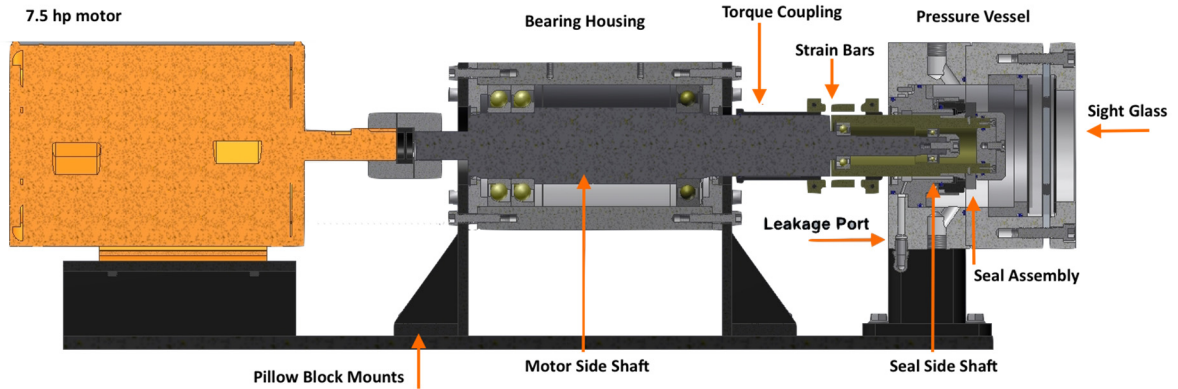


Figure 61. Section view of final system.

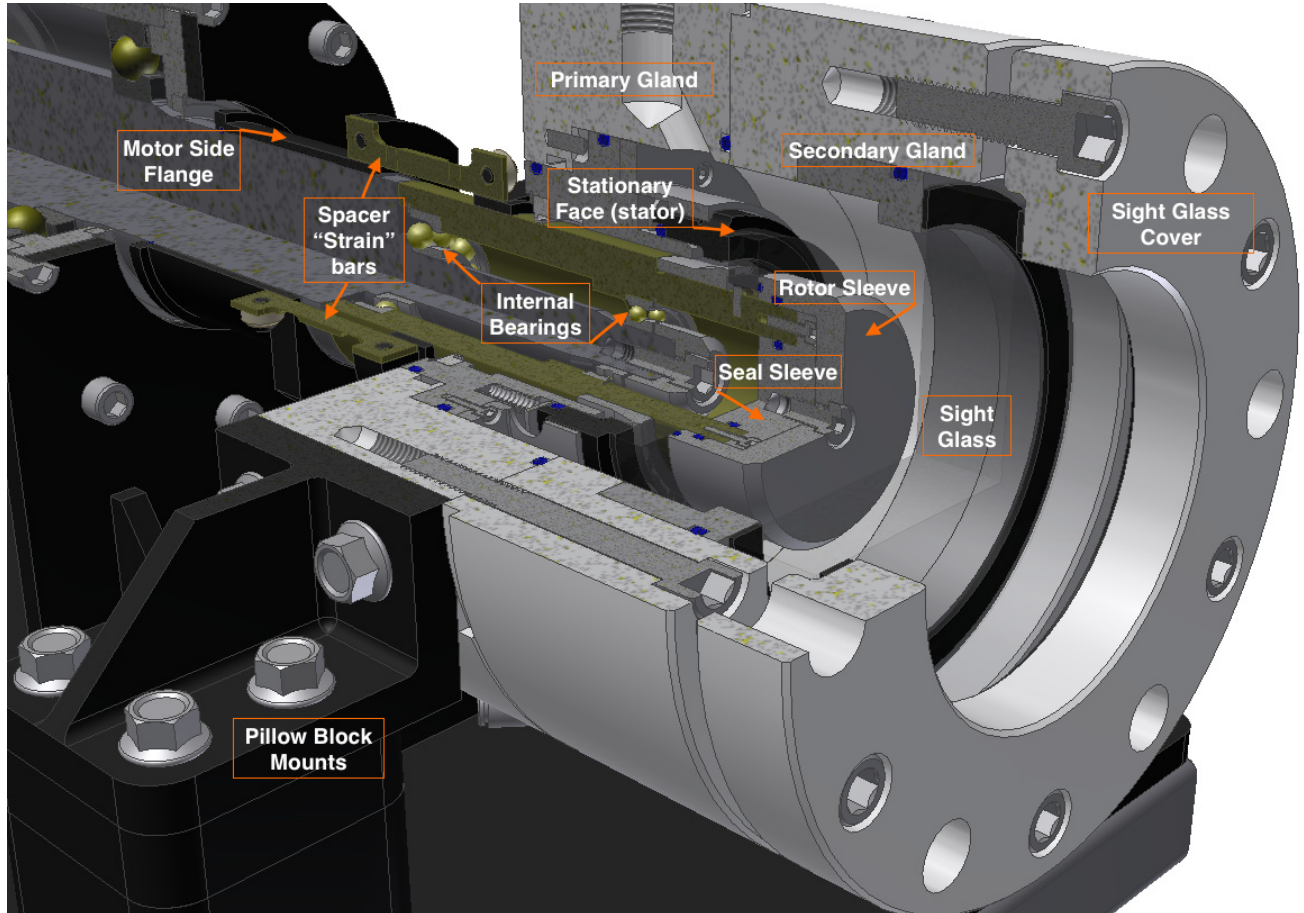


Figure 62. Quarter-cut section view

Detailed Description

The numbers following each component described below indicated the bill of materials number that can be found on drawing XD0219671 in Appendix B.

Supports and Structures

The base plate (3) of the system is machined from carbon steel with holes drilled for placement of the motor mount, bearing casing mounts, and pressure vessel mounts. The bearing casing has two carbon steel endplates with bracketed feet (2), while the pressure vessel is supported by carbon steel pillow blocks (47). The motor is elevated on a carbon steel mount (1) in order to achieve the height required for shaft alignment.

Rotating Components

There are three shafts present in the final system: the motor (27) shaft, the shaft through the bearing housing (35), and the seal shaft (8). The motor shaft is coupled to the bearing housing shaft with a flexible spider coupling purchased from McMaster (28, 29). The bearing housing shaft is machined from 410 stainless steel, and has various steps for mounting the bearing arrangement and the torque coupling, as well as the shaft internal bearing arrangement. The seal shaft is machined from Grade 5 Titanium for increased strength necessary due to the hollow nature of the shaft. The seal shaft slides over the bearing housing shaft and rests on one ABEC 7, angular contact ceramic ball bearing (40) and one ABEC 7, ceramic ball bearing (6). The bearings are held in place with snap rings and shoulders on each of the shafts. The bearing located nearest to the seal assembly (component 6) is held in place with a shaft insert (16) that is fastened with a socket head cap screw into the bearing housing shaft.

The seal assembly is mounted on the seal side shaft within the pressure vessel. The main assembly components are a 316 stainless steel balance insert (26), 316 stainless steel spring holder (10), a rotating face (11), a Grade 5 Titanium rotor sleeve (14), a 316 stainless steel shaft insert (16) and a Grade 5 Titanium seal sleeve plug (18).

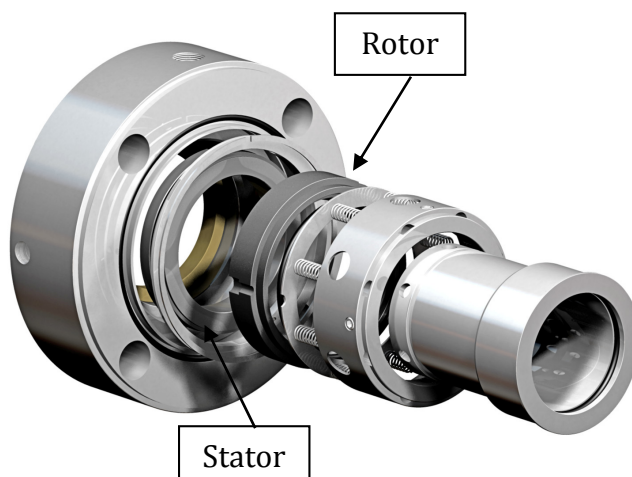


Figure 63. Exploded manufactured assembly view of the pressure vessel and mechanical seal assembly

Torque Measurement

The final strain bar assembly (38) consists of two hubs, both machined from 7075-T6 Aluminum, and four strain bars. The final design of the bars is shown in the images below. The evenly spaced strain bars are machined from Grade 5 Titanium and are located perpendicularly around the rigid coupling hubs. The strain bars are now oriented parallel to the center axis of the coupling hubs and fastened via button head cap screws

and thick washers, which are oriented perpendicular to the center axis. The bars have sections of smaller thickness in order to amplify the strain experienced as the shafts are spun and the friction of the seal faces induces a torque in the shaft assembly. Strain gauges leading to the digital telemetry collar are adhered to the smaller section. The digital telemetry collar is fastened to the motor side flange, and the antenna is fastened with a bracket to the side of the bearing housing so that it is able to surround the end of the collar that transmits the signal.



Figure 64. Torque measurement coupling on system with ATI Digital Telemetry system

Changes in the design and the selection of a design criteria for the strain experienced were discussed more thoroughly with an engineer at Advanced Telemetry International to ensure proper assumptions were made. A strain gauge output of 0.3 mV/V is needed in order to reliably measure the signal. A larger output improves reliability, but substantial improvements plateau around 3.0 mV/V. A design goal was set for 2.0 mV/V with 50 in-lbs. of torque applied.

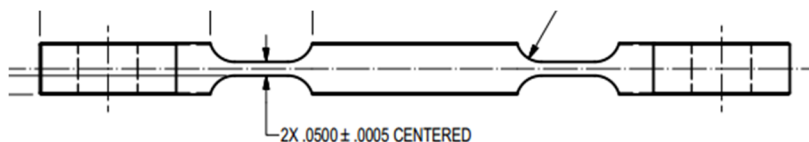


Figure 65. Modified strain bars

In addition to these changes, the coupling hubs are fastened to the shaft via set screws, rather than the keyways used in the previous design. The seal side flange is held in place with four dogpoint set screws, while the seal side flange is held with 2 dogpoint setscrews. The flanges of the hub have cuts in order to fasten the strain bars along the axis of the hubs.

Pressure Vessel

The pressure vessel contains water at 200 psig and simulates the environment experienced by mechanical seals in an industrial application. The pressure vessel is custom-designed to a specific seal arrangement, and includes a sight glass for viewing capabilities during operation. The shell of the vessel consists of a primary gland (41), secondary gland (44), and sight glass cover (51), all made of 316 stainless steel.

The primary gland consists of 6 bolting holes to fasten to the secondary gland. It has an inlet and outlet port for water to flow in and out of the system from the bottom and out the top. Another hole is also made outside of the pressurized section in order to capture the leakage from the system.

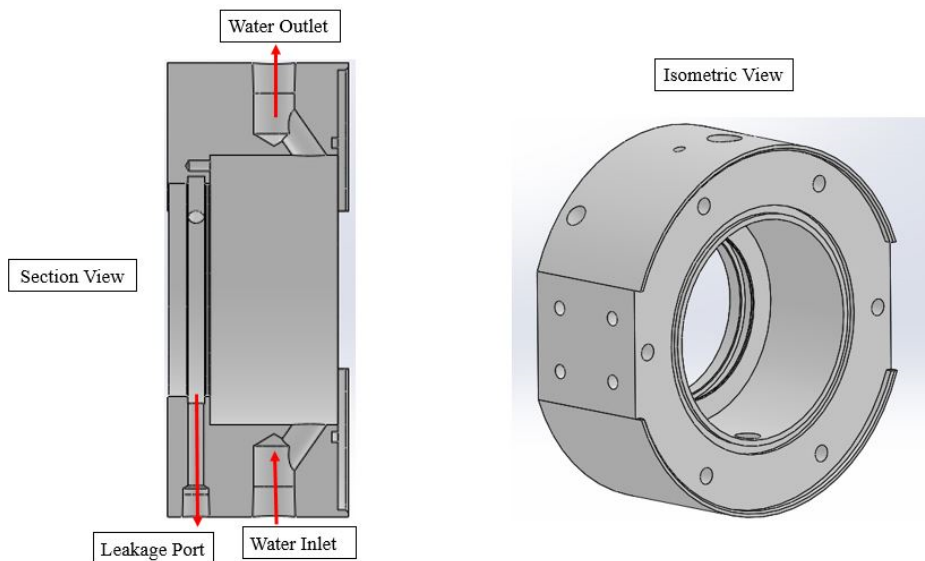


Figure 66. Section view with flow path of fluid and isometric view of primary gland

The secondary gland contains 12 holes evenly spaced along the face. Eight of these holes are clearance holes for the 7/16-14 bolts that will be going into the primary gland. The other 6 holes will be used for another set of 7/16-14 bolts that will be holding the sight glass cover. This piece is removable and allows Flowserve to develop a new endcap that could contain the high-speed camera from Envirocam.

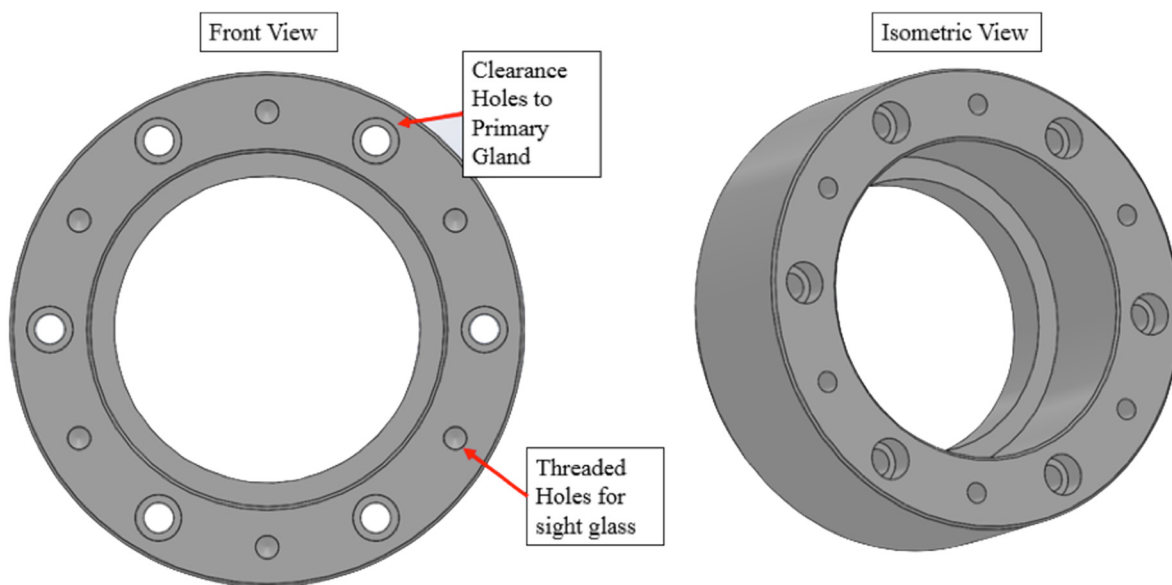


Figure 67. Front and isometric views of the secondary gland

The sight glass used in the system is a 135mm x 25 mm thick Maxos Sight Glass purchased from Glass Dynamics, L.L.C. The sight glass is rated for 363 psi and a temperatures of up to 572F. The Maxos Specification Sheet can be found in Appendix D. The sight glass cover contains 12 bolt holes: 6 are clearance holes and 6 are counterbored holes. The clearance holes are for the bolts used for the primary and secondary gland. The counterbore holes are to connect the secondary gland with the sight glass.

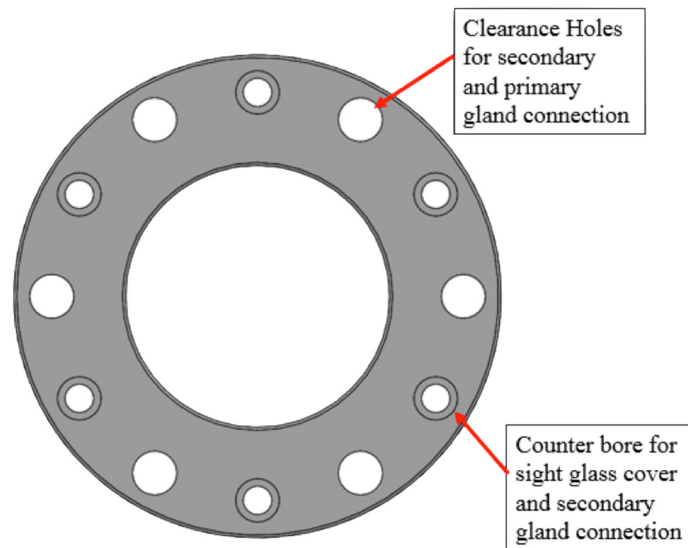


Figure 68. Sight glass cover.

Bearing Housing

The bearing housing (35) and two endplates (32) are machined of 316 stainless steel. Within the bearing housing is a dual matched set of ABEC 7 ball bearings (33) and an ABEC 7 radial ball bearing (36). Oil ports on the top of the housing allow for proper lubrication and better operation of the system.

Cost Breakdown

The cost requirement in the project proposal was to remain under \$10,000. However, due to changes in the design more funds were required to deliver on other major requirements. The overall cost of the system was \$73,500.47, which was approved by Flowserve. The cost breakdown below is broken down between six different sections. Section 1 includes all purchased parts and outsourced labor. Section 2 consists of Flowserve's machining costs, engineering support, and raw materials. Section 3 consists of the material used for the leakage detection system. Section 4 consists of the material purchased for the Cal Poly Calibration Test Mechanism (reference Design Verification). Section 5 includes all Cal Poly student travel expenses. Section 6 is Flowserve's sponsorship fee for the senior project. A more detailed table for the complete cost for the project can be found in Appendix C.

Table 21. Total cost breakdown

#	Sections	Amount ¹
1	Purchased parts, Outsourced labor	\$ 20,738.26
2	Flowserve Costs	\$ 48,378.22
3	Leakage Detection	\$ 451.79
4	Cal Poly Calibration Tester Mechanism	\$ 82.20
5	Travel	\$ 850.00
Total Cost		\$ 70,500.47

Product Realization

System Manufacturing

Due to the high tolerance of the parts in the design, Flowserve Corporation employees completed the manufacturing of the system.

Calibration Tester

The components for the calibration verification test system were manufactured by the S.E.A.L.S. team at the Cal Poly Machine shops. The intermediate shaft was cut from a 0.625 stock carbon steel and placed on a lathe where it was faced and turned down to $\frac{1}{2}$ " so that it would fit into the clamps and the end was turned down to a $\frac{3}{8}$ " diameter so that the pulley would fit. The component was then cut to length on the band saw and then faced for a clean finish. The mount rod was cut from the same rod that was used to cut the intermediate shaft. Because both components had to be turned down 4 inches or more, a live centering tool was used in order to make sure that the parts would not deflect when they are being cut, as seen in Figure 67.



Figure 69. Machining of immediate shaft

The vertical rod was made from 6061 Aluminum faced and turned on the lathe. No live tooling was required because the cut that was made on the shaft was a small cut. A die cutter was then used to cut the 5/16-18" threading required at the end of the shaft. Figure 68 below shows this process.

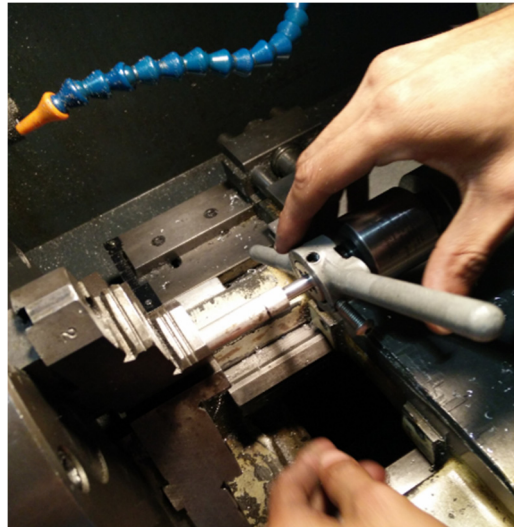


Figure 70. Machining of the vertical rod

The bracket was machined on the manual mill, shown in Figure 69. A 1/2" 2 flute HSS endmill was used cut the aluminum part from a stock size of 2.5" x 1" x 1.5". Parallel bars were used to lift the part in the clamp so that the part could be cut without any re-fixturing. The holes were drilled using step and pecking drilling methods. The hole on the top lip was then tapped so that the vertical rod could be threaded in.

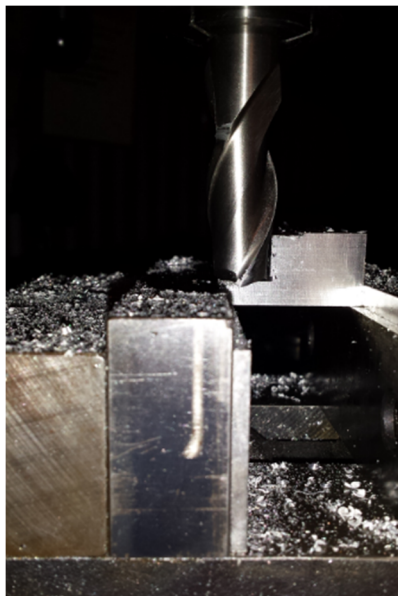


Figure 71. Machining of the bracket

The mounting bar was made from a 1" stock steel bar. The bar was cut to size on a bandsaw and then the holes were drilled using step and pecking methods. The burs on the bar were then grinded down on a grinding wheel.



Figure 72. Cutting steel bar to length

The system was then assembled at Flowserve. In addition to this, two washers were added in to the section where the vertical bar connects to the bracket because the die cutter was not able to cut the entire bottom step.

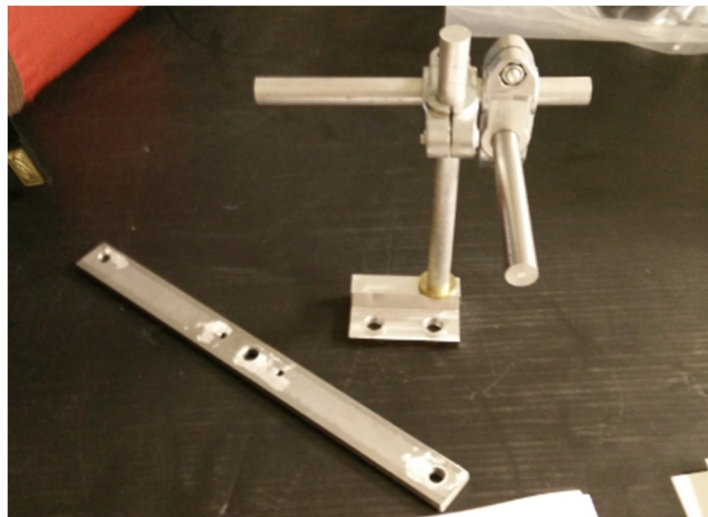


Figure 73. Assembled torque verification tester

Leakage Measurement System

The components for the leakage measurement system were purchased from third-party vendors with the exception of the leakage capture container and the sheet metal holding plate. Both parts were machined from 6061 Aluminum.

The capture container required several manufacturing processes in order to gain its final geometry. The first was to bore the inside diameter to give the solid aluminum billet a holding volume. This was accomplished using a lathe and stepping up boring bits to a 1 inch diameter, then cutting the rest of the diameter out with a 1 inch boring bar with inter-tool cooling using a quick program on the CNC lathe. This total process required 45 minutes of cutting.

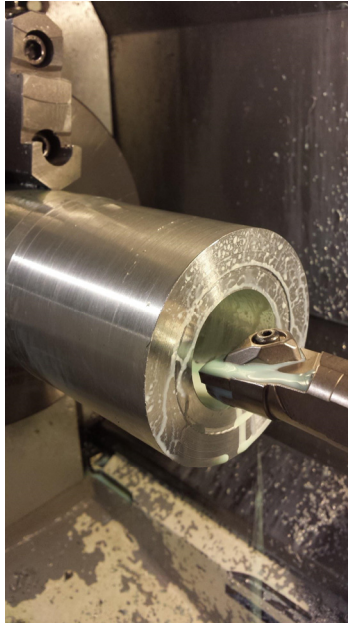


Figure 74. Cutting diameter of leakage measurement cylinder

After the inside diameter of 3.0 inches was achieved, the outer side of the holding tank was turned and faced using the lathe to clean up the part. The cylinder was then loaded in a mill for proper positioning, drilling, and tapping of the holes for the $\frac{1}{4}$ inch NPT nipple and M12x1 optical sensor.

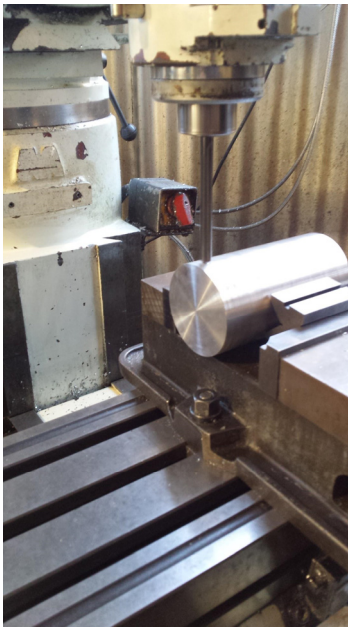


Figure 75. Cutting inlet and outlet ports

The pattern for the holding plate was cut into 0.060 inch sheet aluminum using a laser cutter. Originally, it was planned to use a brake press to bend the positioning tabs on the holding plate, but one with the proper-sized bits was not available. In order to bend them, a small screwdriver and rubber-jawed pliers were used.

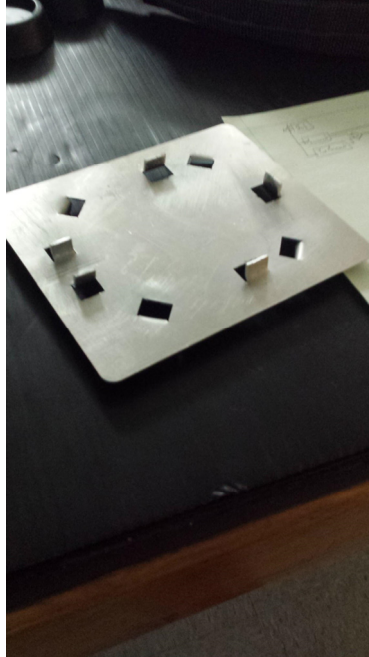


Figure 76. Finished mounting plate

Thread tape was applied to the threads on both sides of the nipple and it was first securely tightened to the solenoid valve, then the two were attached to the holding tank. A brass fitting with a quick-release hose clamp was tightened into the other end of the solenoid valve after applying thread tape. The components were then lowered into the holding plate, and the tabs were adjusted to tightly hold them. Finally, the tabs on the bottom of the holding plate were adjusted to the weigh plate on the scale, and the holding plate with the components was installed onto the scale.

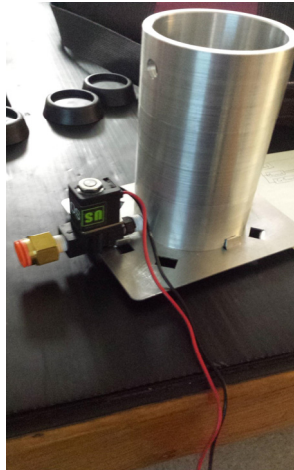


Figure 77. Assembled leakage measurement system

In order to minimize the wandering of the leakage measurement system due to the entire testing apparatus, anti-vibration pads were selected and purchased. For ease of adjustment later on, the pads were not permanently attached to the scale, but are positioned below the scale feet.

Safety Considerations

As mentioned throughout the design section of this document, the new tester has been designed to comply with all applicable industrial and professional standards. This section discusses safety considerations for all who interact with the tester, as well as the safety of the system components.

This system operates with water with conditions up to 200° F and 200 psig from a support system. When properly connected to the support system (see operations manual) there should be little concern for failure. However, a loose connection at the inlet and outlet lines could result in hot, pressurized water causing injury to the user. One must also take care when disassembling the system. Heavy components such as the pressure vessel end cap could cause bodily injury if not held properly during disassembly. During testing, it is important to slowly ramp up the pressure after assembling the system with a seal configuration. During initial testing, the vessel was pressurized to 250 psig to test for failure. There was no failure, nor any damage to the system. However, it is advisable to initially pressurize the system with all personnel removed from the testing room, in the rare case the vessel end cap was not securely fastened.

Given the weight of the system, extreme caution must be taken whenever the system is moved using the mobile table. The table cannot be lifted or tipped from exertion by the average human at the top level of the table; however, there is a possibility that the table could tip if moved across an even surface. Therefore, we advise to only transport this table across surfaces with less than or equal to a 10° grade.

To protect the integrity of the sight glass of the pressure vessel, it is advised that two persons assist in the assembly and disassembly. While disassembling, all parts should be placed on a level, clean surface so that parts remain clean and safe. This is essential to maintain the sealing effect within the pressure vessel. All O-rings should be lubricated before being placed in their proper locations during assembly. The motor should be disconnected from electrical power during assembly and disassembly. One final safety consideration is also mentioned in further detail in the Further Recommendations section of this report, but it deals with operating at the systems natural frequency to prevent severe vibrations of the table. To prevent injury to personnel or damage to the components, it is important that all components be securely mounted to the table or one of its accompanying shelves.

Maintenance/Repair Considerations

Motor

The Baldor 7.5hp motor is encased such that no maintenance is required other than lubrication of its enclosed shaft bearings. The manufacturer recommends lubrication every 5500 hours of use, regardless of load or speed. At such time, there are two Zerk grease fittings for both bearings to be slowly injected with 0.2in³ of grease each. Baldor uses Polyrex made by Exxon Mobil. Upon adding grease, remove grease gun, clean the fitting, run the motor for 15 minutes to purge excess grease, and clean the fitting once more. Refer to the manufacturer's manual (attached in Appendix H) for troubleshooting, and replace if problems persist.²⁶

Bearing Casing

Apart from routine checks of the material of the bearing casing, the oil bath the bearings operate in needs to be checked for contamination every three months and changed every year. The bearing manufacturer SKF recommends using SAE 25W oil for the bearings selected. Upon excess vibration and shaft misalignment, the bearings should be checked for defect and replaced in the case of failure.

Torque Sensor

For accuracy, the calibration of the torque sensor needs to be verified annually. To do so, the testing rig used in Chapter 6 is to be installed on the shaft and the output on the onboard power supply/multimeter caused by loading the test rig is to be compared to the torque calibration data supplied by ATI. The torque sensor should be sent to ATI for recalibration if the output is not within 10% of the supplied data. Should the output be not within 10% of the supplied data, the torque sensor needs to be sent to ATI for recalibration.

Pressure Relief Valve

The pressure relief valve, or PRV on the pressure vessel is calibrated to 110% of design pressure, or 220 psig. The PRV will open and release the system pressure at 220 psig. The calibration of this PRV is paramount to the safety of the system and should therefore be checked every month during system operation. This is accomplished by installing the PRV to a calibrated pressure system fueled by nitrogen, setting the system's pressure to the design (220psig), and adjusting the PRV until it just barely allows gas to escape.

Sight Glass

The sight glass at the end of the pressure vessel is made of a material such that its integrity needs to be checked at every installation. This is done visually, checking for cracks and other signs of fatigue. Should any minute signs of failure be detected, the piece needs to be replaced.

Base Plate

The base plate needs to be routinely checked for cracks and fatigue. Any components mounted to the base plate should be tightened every cycle to prevent system misalignment. If components are not routinely checked, the system could be misaligned and the alignment should be checked. Should fatigue be apparent, remanufacturing the plate is recommended.

Cart

Although chosen with a large safety factor, the cart and specifically the casters on it require routine checks every month. Signs of fatigue will become visually apparent in the joints and welds, as well as the axle for each wheel. The brakes on the casters should be checked for wear by locking them and subjecting the cart to vigorous force. In the event of any sign of wear, components should be replaced, whether an individual caster or the whole cart.

Leakage Measurement System

The output of the scale used for the leakage measurement system should be checked every six months. This is done with a calibration mass and verifying the output of the scale both on the digital readout and the data acquisition computer. Should the calibration be off, the scale has an onboard adjustment knob for correction.

Design Verification

Digital Telemetry Calibration

Engineers at Advanced Telemetry International Telemetry calibrated the coupling using precise equipment and methodology. The certified calibration data may be found in Appendix D. The equipment consists of a computer, a gear drive, a DAQ system, and a reference sensor. The computer provides rotational control of the gear drive via the variable frequency drive. It also provides the DAQ to measure the applied torque through the reference sensor and the output of the test article; in this case, the coupling. The coupling is connected between the output of the gear drive and the input of the reference sensor using adapters and supports. The reference sensor itself is chosen to match the range of the desired full scale of the coupling.

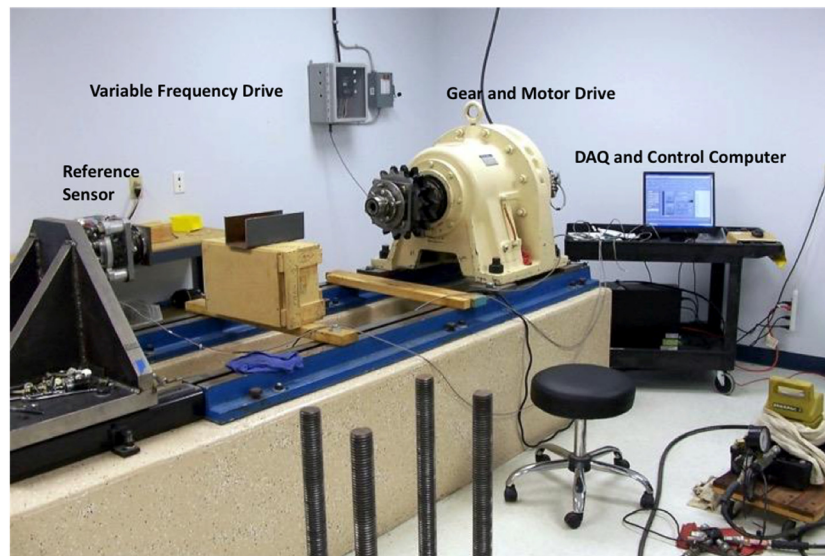


Figure 78. ATI's calibration environment

Full results from ATI's calibration can be found in Appendix J. Table 21 provides a summary of the full results. Figures 77 and 78 are pertinent plots extrapolated from the data.

Table 22. Summary of calibration results from ATI

Counter clockwise	
Full Scale Bridge Output	-4.148 mv/V
Worst-Case Non-Linearity	0.28% Full Scale
	-0.116 mV/V
Worst-Case Hysteresis	0.13% Full Scale
	0.05392 mV/V
Clockwise	
Full Scale Bridge Output	4.546 mv/V
Worse-Case Non-Linearity	0.15% Full Scale
	0.0682 mV/V
Worst-Case Hysteresis	0.38% Full Scale
	0.38% Full Scale

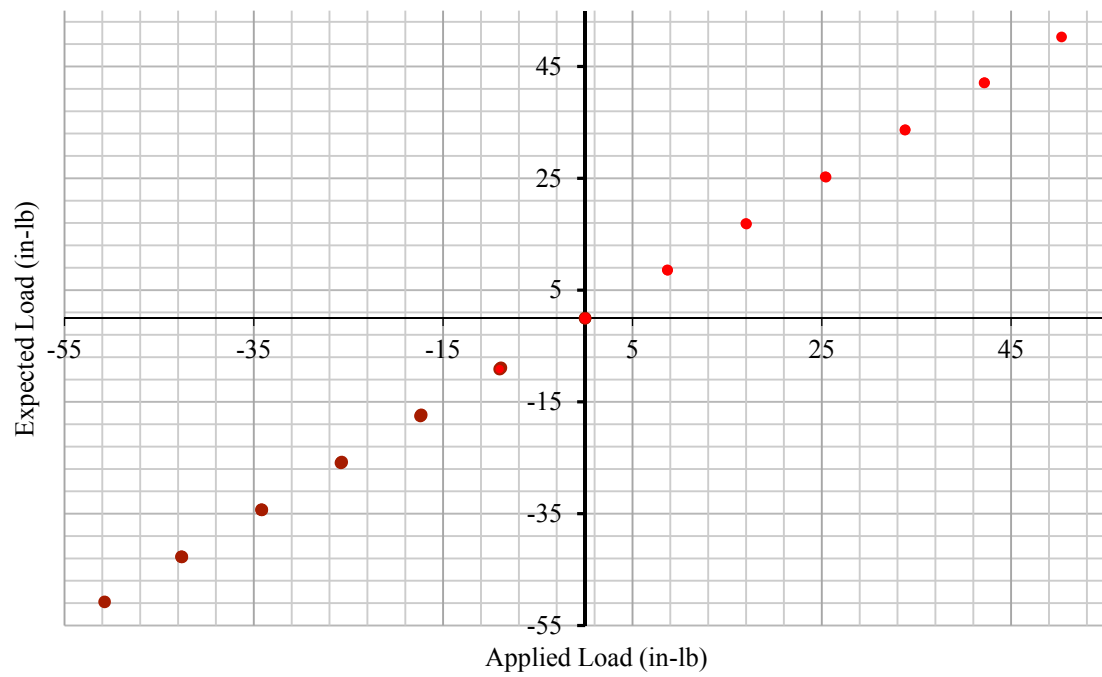


Figure 79. Linearity between the expected load and the applied load on the coupling

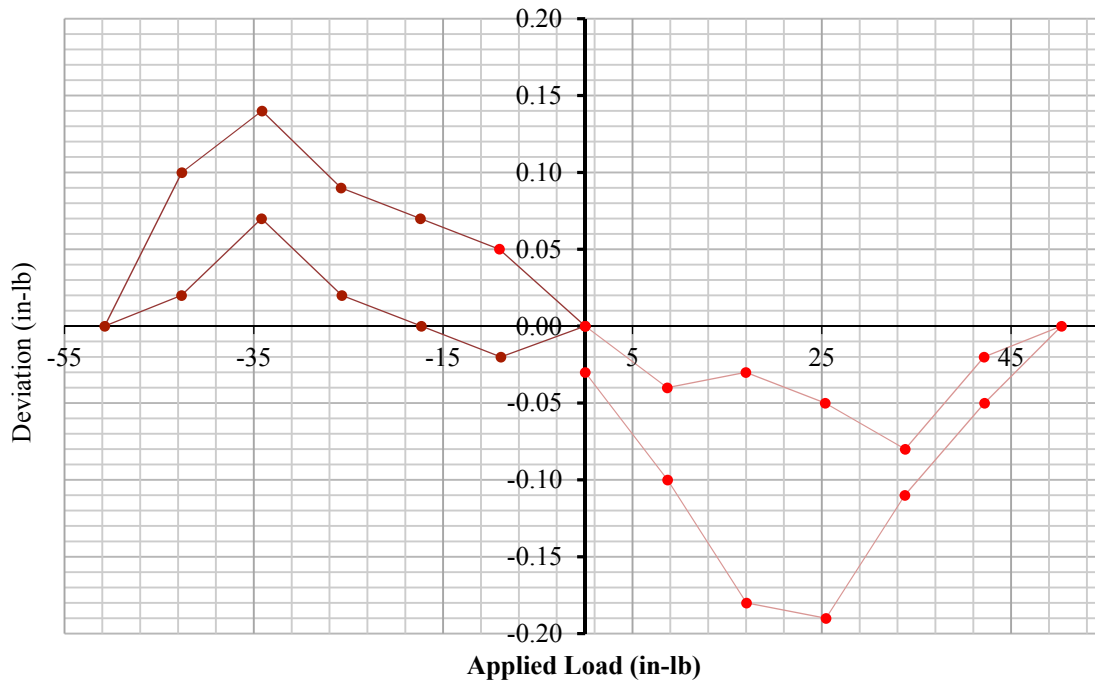


Figure 80. Deviation from the expected and applied load.

Torque Measurement Verification

Two tests were performed in order to verify the design objectives and engineering specifications were met. The first test had the pressure vessel disassembled; the secondary gland and sight glass cover were removed and the shaft was exposed without the seal configuration. A bar was screwed with lock-tight button head screws in two of the eight positions for the socket head cap screws to hold the rotor sleeve onto the shaft, as well as a socket head cap screw in the center of the bar screwed in where the rotor sleeve is fastened to the seal plug. The bar was positioned parallel to the tabletop with holes on either side positioned five inches from the center screw. Matched sets of weights on either side created a couple on the shaft, which, when the shaft is held in place, should theoretically produce a near constant torque output.

The goal of this test was to calibrate for different torque ranges. As stated above, the coupling was calibrated by ATI when their engineers attached the strain gauges to the coupling, and they supplied results of the expected output for respective applied loads. The weight sets were chosen to be similar to the applied loads that ATI calibrated, and the output was compared to their expected value. This verified the accuracy of the calibration and torque measurement.

The second test ran the system with all components assembled with a seal in place in order to verify environmental specifications as well as torque output precision and accuracy. Data was collected at various speeds and pressures in order to evaluate the system. In doing so, the specified temperature, pressure range, speed range, and measurement accuracy and resolution were verified. This test is further detailed in the next section, System Verification.

Results

Given the precision with which the testing apparatus was built, this was not possible. However, a measurement was taken at the moment the weights were allowed to hang freely and the shaft had not yet shifted in order to gain the most relevant measurement. Once the shaft shifted in the slightest, the reading was negligible due to the acceleration of the weights affecting the torque occurring on the seal faces. The results showed the accuracy and precision requirements were within an acceptable range. With this knowledge, the testing proceeded on to the full system assembly and testing.

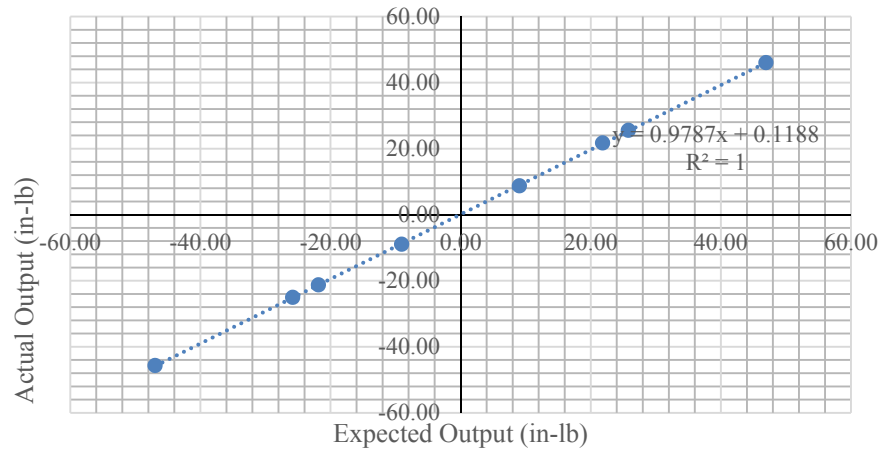


Figure 81. Test data verifying ATI's calibration with our own test assembly

Leakage Collection Verification

A single subsystem test was performed in order to verify the requirement of collection of leakage from the tester and measurement output to a data acquisition computer. This test was done using the digital scale connected to the DAQ after the scale was component tested. Water was manually dropped into a plastic beaker on the scale while the DAQ collected the measurement output by the scale. The machined aluminum holding tank was not used for this test. The mass measurement output was relayed back to the controlling computer running the LabVIEW code developed, which is attached in Appendix K.



Figure 82. Leakage measurement test setup in Flowserve lab.

Results

The test proved that the digital scale is able to output its measurement accurately to the data acquisition system. Generated from the raw output data, which is attached in Appendix I3, the following plot shows the normalized (tared) mass measurement output over time. The sample rate was set at 15 seconds and shows water being added into the beaker over the 25-minute test. It should be noted that the data collection was manually paused near the beginning of the test for adjustment of the equipment.

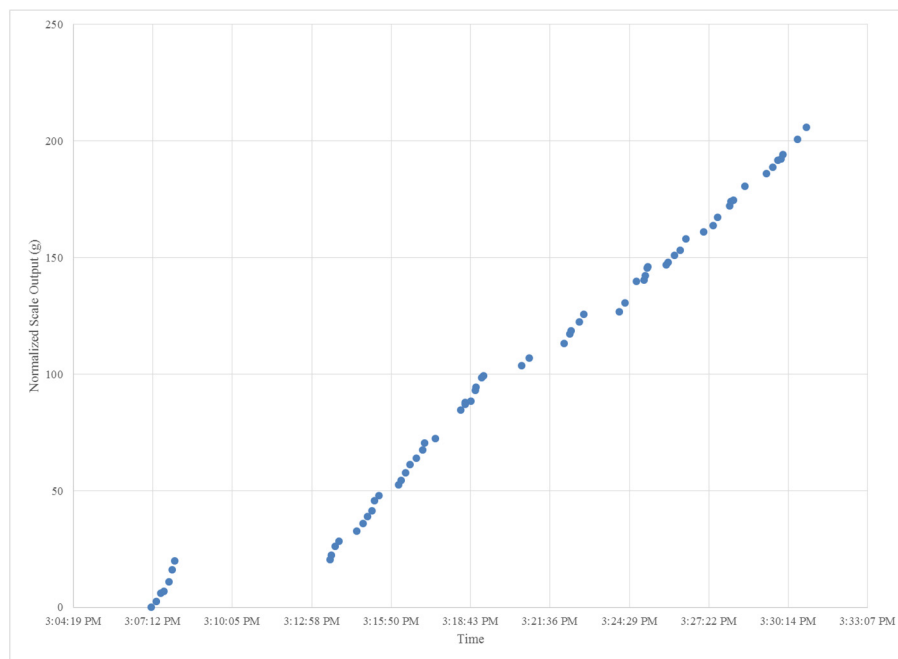


Figure 83. Scale output over time over collection test.

The code that was developed used the captured mass measurement to calculate the average leakage rate as well. The mass measurement is output in grams, which makes conversion to water volume easier because one gram is defined as the mass of one milliliter of water. The following plot shows the average leakage rate converted to milliliters over time. It is a running average, so the beginning of the plot shows a high leakage rate, then it evens out to the actual linear leakage rate over the course of the test.

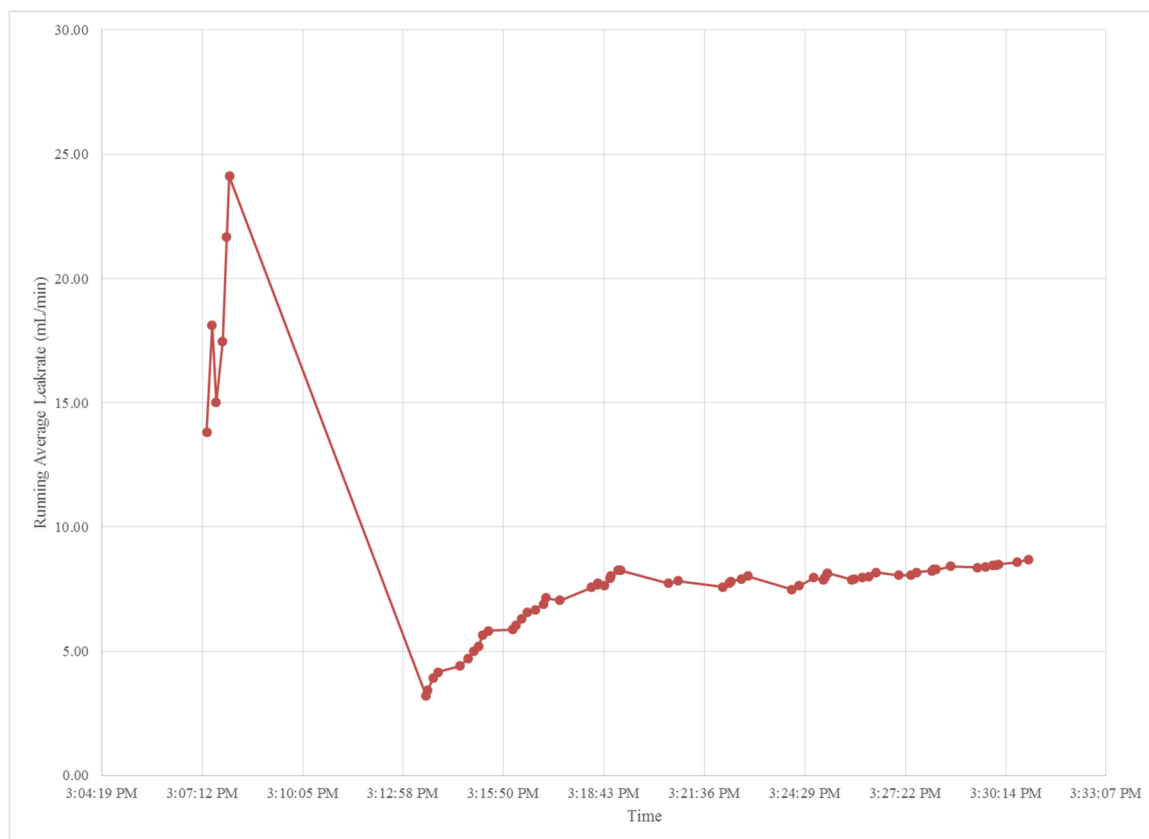


Figure 84. Running average leakage rate over time of the leakage collection test.

All of the raw data used to generate these plots is in spreadsheet form is attached in Appendix I3. By verifying that the digital scale output the measurement of water being dropped into a beaker on it to the data acquisition system, this test confirmed the requirement of the leakage collection and measurement subsystem.

System Verification

The system verification test was performed with a flat face quartz rotor and carbon rotor. Data was collected at 12 different shaft speed and seal chamber pressure combinations in the following manner:

1. The system was started with controls set for a shaft speed of 1500 RPM and seal chamber pressure of 50 psi.
2. The shaft speed was increased to 2500 RPM and then to 3600 RPM, while maintaining the pressure of 50 psi.
3. The shaft speed was maintained at 3600 RPM while increasing pressure to 100 psi.
4. The speed was reduced to 2500 RPM and 1500 RPM, while maintaining the pressure of 100 psi.
5. The pressure was increased to 150 psi while maintaining 1500 RPM.
6. The shaft speed was increased to 2500 RPM and then to 3600 RPM, while maintaining the pressure of 150 psi.
7. The shaft speed was maintained at 3600 RPM while increasing pressure to 200 psi.
8. The speed was reduced to 2500 RPM and 1500 RPM.

The data was truncated in order to eliminate the ramp-up and ramp-down data. The time for each respective data set was normalized in order to generate useful results for comparison of torque at each pressure, and also for comparison of torque for each shaft speed. The following figures and tables demonstrate these

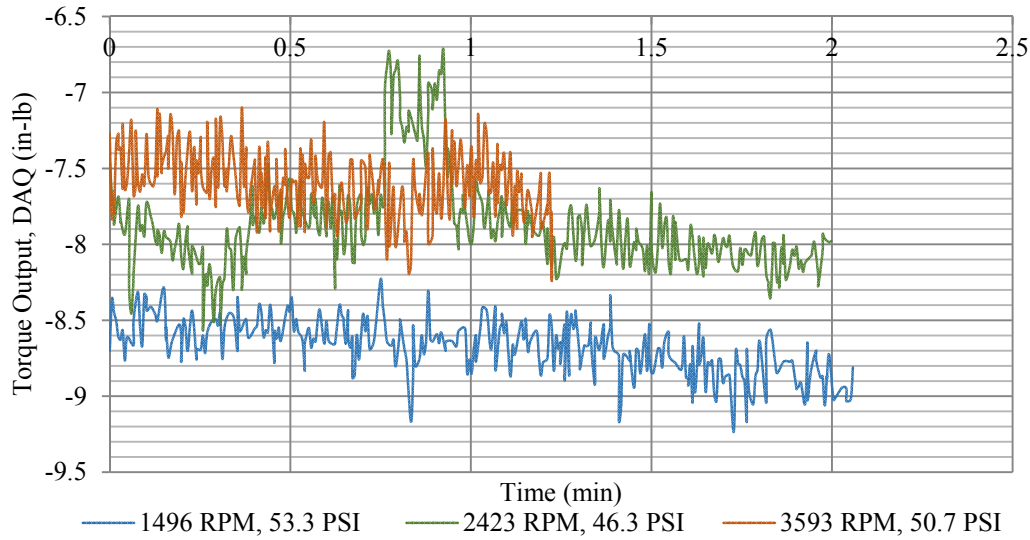
relationships. During testing, it was discovered that the critical speed of the system for 50 psi and 100 psi was just below 2500 RPM. Reaching the critical speed resulted in large vibrations of the entire unit. The vibrations were less extreme at this value for 150 psi, but still of noticeable magnitude. This would explain the large deviations from the average torque reading at 2500 RPM at each of these pressures.

It is important to note the discrepancy in noise level on the transmitter supplied by ATI versus the noise level shown by the data collected from LabVIEW. The transmitter appeared to experience approximately 0.05 in-lb of variation when supplied with a constant speed and pressure control, whereas the LabVIEW data averages around 0.3 in-lb of noise variation. The disagreement between the two is believed to be caused by the wiring of the DAQ system within the Flowserve facility.

The first set of data was taken at approximately 50 psi for each respective speed. The maximum standard deviation for the torque reading occurred for a shaft speed of 2500 RPM. This is most likely due to the decline in torque that occurred between 0.5 minutes and 1 minute of data. The other two deviations remain below 0.25 in-lb, which was the design specification for torque measurement accuracy.

Table 23. Data from first run at 50 psi

	Torque (in-lb)	Seal Chamber Temperature (F)	Seal Chamber Pressure (psi)	Shaft Speed (RPM)
50 psi, 1500 RPM				
Maximum	-9.459	69.277	53.343	1501.3
Minimum	-8.233	68.824	48.435	1491.8
Mean	-8.708	69.052	50.784	1496.4
Median	-8.695	69.046	50.700	1496.4
Standard Deviation	0.179	0.114	1.488	1.3
50 psi, 2500 RPM				
Maximum	-6.725	69.830	56.976	2427.4
Minimum	-8.566	69.357	-1.675	2419.1
Mean	-7.870	69.619	46.295	2422.7
Median	-7.939	69.618	49.358	2422.7
Standard Deviation	0.327	0.115	12.638	1.4
50 psi, 3600 RPM				
Maximum	-7.100	69.838	46.153	3596.5
Minimum	-8.237	69.220	42.270	3587.1
Mean	-7.589	69.563	43.563	3592.5
Median	-7.605	69.584	43.543	3592.5
Standard Deviation	0.220	0.156	0.613	1.4



The first set of data was taken at approximately 100 psi for each respective speed. The maximum standard deviation for the torque reading occurred for a shaft speed of 2500 RPM once again. The other deviations remained between 0.20 and 0.30 in-lb. This is evidence of a system that meets the design specification of an accuracy of 0.25 in-lb.

Table 24. Data from run 2 at 100 psi

	Torque (in-lb)	Seal Chamber Temperature (F)	Seal Chamber Pressure (psi)	Shaft Speed (RPM)
100 psi, 1500 RPM				
Maximum	-12.174	72.274	122.065	1518.4
Minimum	-10.815	72.044	114.216	1509.7
Mean	-11.576	72.163	116.355	1513.3
Median	-11.617	72.172	116.434	1513.4
Standard Deviation	0.275	0.056	1.253	1.5
100 psi, 2500 RPM				
Maximum	-10.916	71.342	117.836	2530.1
Minimum	-8.278	71.176	108.852	2522.0
Mean	-9.903	71.256	113.926	2526.2
Median	-9.965	71.252	113.954	2526.2
Standard Deviation	0.422	0.039	2.192	1.2
100 psi, 3600 RPM				
Maximum	-9.335	70.518	117.360	3596.6
Minimum	-7.893	70.157	106.539	3588.9
Mean	-8.474	70.356	112.374	3592.8
Median	-8.476	70.360	112.632	3592.9
Standard Deviation	0.222	0.082	2.515	1.4

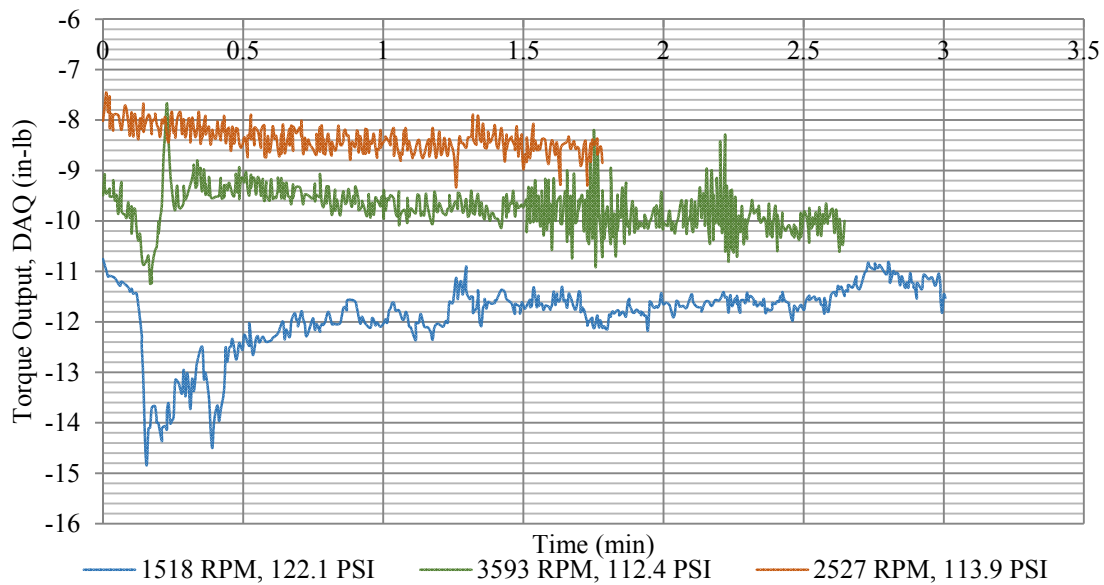


Figure 86. Plot of data from second run at 100 psi.

The first set of data was taken at approximately 150 psi for each respective speed. The maximum standard deviation for the torque reading occurred for a shaft speed of 2500 RPM, and was quite significant. Examination of the chart below showing the variations in torque over time will highlight the sporadic data taken for the 2500 RPM shaft speed during this run. The raw data does not show any significant changes in seal chamber pressure that may have caused such a large variation in the measurement, and it is quite possible that much of this had to do with noise in the DAQ signal itself. The deviation for 1500 RPM was also rather large, as well, and this occurred just after before the 2500 RPM data collection. This may also have been from noise in the DAQ signal, since the deviation for 3600 RPM was below 0.20 in-lb.

Table 25. Data from run 3 at 150 psi

	Torque (in-lb)	Seal Chamber Temperature (F)	Seal Chamber Pressure (psi)	Shaft Speed (RPM)
150 psi, 1500 RPM				
Maximum	-14.155	72.608	157.353	1518.4
Minimum	-10.827	72.353	148.879	1510.5
Mean	-12.652	72.482	152.975	1513.4
Median	-12.685	72.487	152.341	1513.5
Standard Deviation	0.569	0.059	2.410	1.2
150 psi, 2500 RPM				
Maximum	-13.723	72.211	157.229	2529.6
Minimum	-6.981	71.991	153.271	2522.4
Mean	-9.772	72.112	155.218	2525.9
Median	-9.785	72.116	155.205	2525.8
Standard Deviation	1.440	0.049	0.807	1.3
150 psi, 3600 RPM				
Maximum	-10.577	72.413	151.715	3597.5
Minimum	-9.451	72.051	147.161	3587.2
Mean	-9.962	72.233	148.845	3592.6
Median	-9.959	72.236	148.901	3592.6
Standard Deviation	0.184	0.083	0.832	1.5

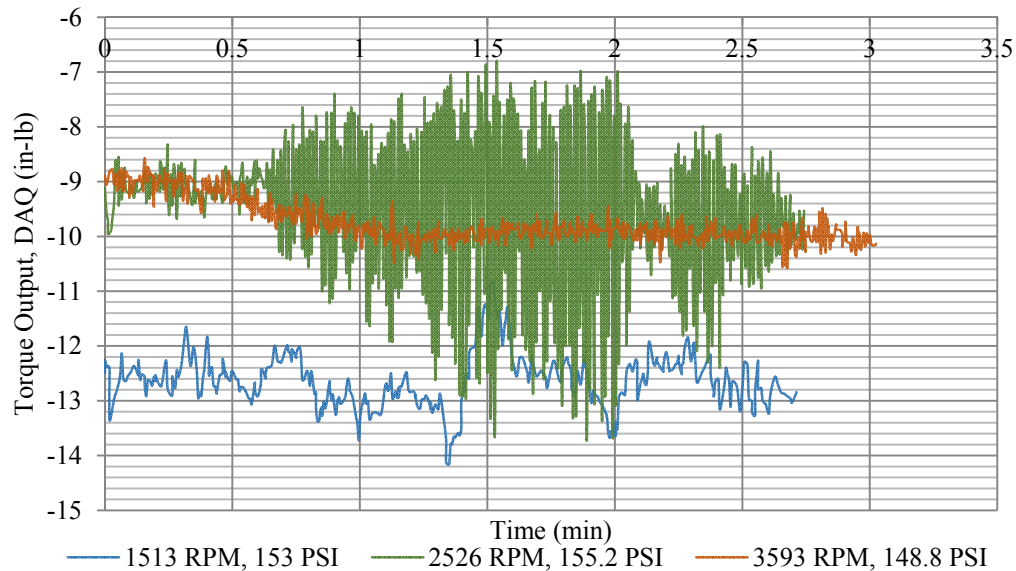


Figure 87. Plot of output data from run 3 at 150 psi.

The first set of data was taken at approximately 200 psi for each respective speed. The maximum standard deviation for the torque reading occurred for a shaft speed of 1500 RPM. Interestingly enough, the deviation for the shaft speed of 2500 RPM was below 0.25 in-lb, while the deviation for 3600 RPM was larger at 0.50 in-lb. It is unclear what may have caused the data to vary so drastically.

Table 26. Data from run 4 at 200 psi.

	Torque (in-lb)	Seal Chamber Temperature (F)	Seal Chamber Pressure (psi)	Shaft Speed (RPM)
200 psi, 1500 RPM				
Minimum	-14.918	74.623	198.014	1517.9
Maximum	-9.169	74.485	196.207	1508.6
Mean	-12.295	74.539	197.214	1513.4
Median	-12.291	74.536	197.244	1513.3
Standard Deviation	1.087	0.028	0.372	1.4
200 psi, 2500 RPM				
Minimum	-10.390	73.914	197.346	2478.4
Maximum	-9.054	73.595	192.482	2469.4
Mean	-9.742	73.778	194.919	2474.4
Median	-9.744	73.789	194.967	2474.4
Standard Deviation	0.217	0.071	0.864	1.4
200 psi, 3600 RPM				
Minimum	-11.383	72.786	207.593	3599.4
Maximum	-9.391	72.564	201.169	3589.0
Mean	-10.368	72.687	204.563	3592.6
Median	-10.392	72.684	204.653	3592.6
Standard Deviation	0.459	0.050	1.495	1.5

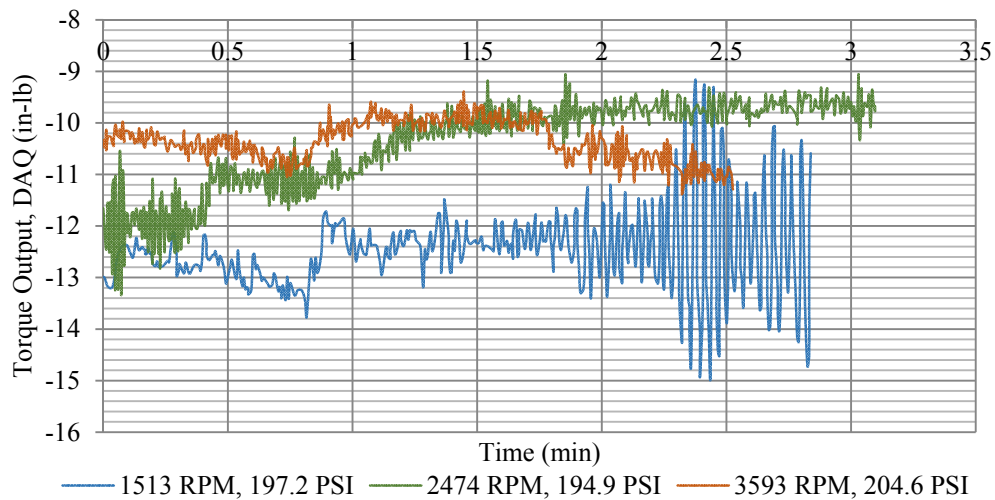


Figure 88. Plot of data from run 4 at 200 psi

The data was plotted together on charts according to varying seal chamber pressure for each respective shaft speed. Interesting to note is how much more smooth the data becomes at 3600 RPM (Figure 83) The forces in the system at this speed are more stable, and the torque is more predictable. The chart for 1500 RPM is interesting at 50 psi. The low speed and pressure cause a very low torque when compared to the other pressure values. This data also appears to be more stable than the other data at this shaft speed. As stated above, the critical speed of the system is around 2500 RPM. The chart showing this shaft speed indicates large variation in data due to the less stable nature of the components during the testing at 150 psi.

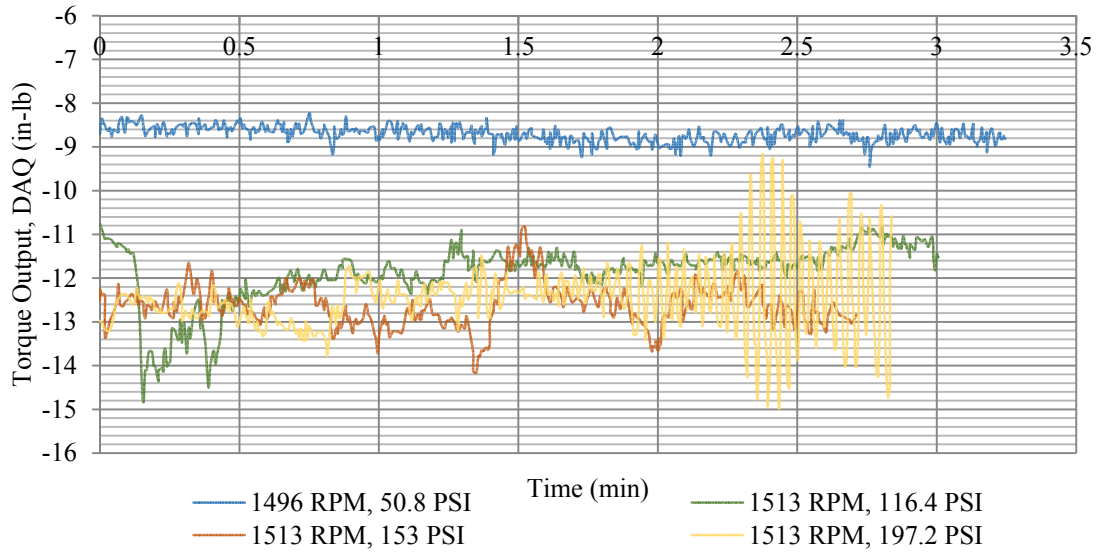


Figure 89. Summary of torque output from all runs at approximately 1500 RPM.

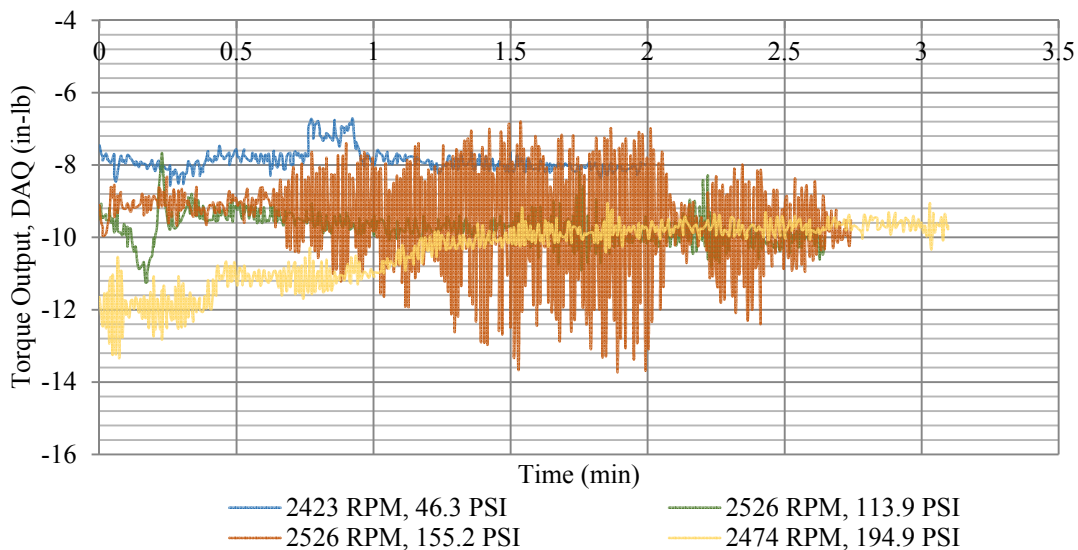


Figure 90. Summary of torque output from all runs at approximately 2500 RPM.

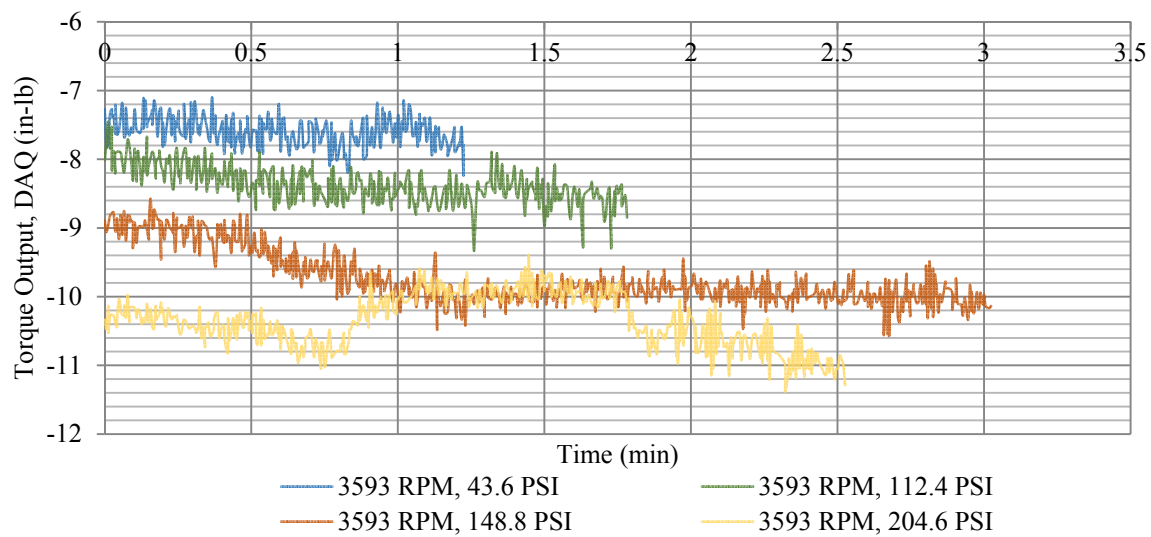


Figure 91. Summary of torque output from all four runs at approximately 3600 RPM

Design Verification Plan Report

In the beginning of this project, we were given a set of engineering requirements that our system had to achieve. This list is labeled as Table 1 in Introduction. The table below is a copy of those engineering requirements, but with results for each parameter if they were found to be in compliance.

Table 27. Original engineering requirements with system results

Specification	Parameter Description	Requirement or Target	Result
1	Housing Pressure Rated	200 psig	Rated for 1,077. Tested up to 250 psig
2	Shaft Operation	Variable speed up to 3600 rpm	Tested at speeds at 1500, 2500, 3600 rpm from LabVIEW
3	Temperature	Working fluid temp 70-200°F	Sight glass rated up to 573°F. Tested at 70°F
4	Data Collection	DAQ with LabVIEW	Test successful. See Appendix J for results
5	DAQ	Resolution of 0.025 in-lbs; accuracy of 0.25 in-lbs	Met; see Further Work. Results can be found in Appendix J
6	Auxiliary Measurement	Collection of escaped fluid	Collects leaked fluid and output is sent to the DAQ. See Appendix I3 for test data.
7	Safety	Meet or exceed Flowserve's safety standards	See Chapter 4 for applicable standards met
8	Assembly	Design for easy assembly	Assembly for testing took one hour. An hour less than previous system
Specification	Parameter Description	Requirement or Target	Result
9	Compatibility	Connect with current support system	Compatible with Flowserve's existing LabVIEW
10	Cost	Budget of \$10,000	Exceeded budget. See Cost Breakdown Table 20
11	Set-up Time	Comparable to existing system	Total time is 1 hour, half the time for existing system
12	Camera	Inclusion of EnviroCam	Excluded from this project. Able to include in later modifications.
13	Transport	Able to move with ease	Table is mobile.
14	Test Conditions	Working fluid is water	Tested with water at 70°F and 250 psig
15	Visual Inspection	View seal interface	Can see seal interface axially with transparent seal. See Further Work

Conclusion and Recommendations

We have determined as a team of engineers that the project specifications have been met with integrity. The method of torque measurement achieves the desired accuracy and resolution requirements set forth in the project proposal. The system includes a pressure vessel that is able to contain the desired pressure and temperature as well. The overall system can be operated at the variable shaft speeds from up to 3600 RPM, at varying pressure levels.

There are several recommendations for improvement of the system in order to further reduce hysteresis and improve accuracy in the torque reading. First is a more permanent table for the system to be mounted on, along with the digital telemetry components. This would increase stiffness and reduce vibration when the critical speed is reached, ultimately reducing noise in data collected. Further investigation into the critical speed of the system will also enhance data collection.

Second is a more precise calibration testing apparatus: the one utilized for verification of an acceptable output range of the torque collar based upon the data supplied by ATI served its simple purpose; however, if it were to be used in the future, several modifications must be made. First and foremost is more precise machining and assembly of the components. The current state of the apparatus is a product of tooling and materials that were available to the students at Cal Poly. In order to produce accurate results in the calibration of the digital telemetry system, the apparatus should be positioned using a level. This will ensure that all components exist at 90 degree angles to one another and that the sting suspended from the pulley is perpendicular to the bar attached to the shaft. The bar itself should be machined with tighter tolerances in order to create a more perfect couple. Attaching calibrated weights to permanent cables on the bar would also improve the couple.

Third is to reduce the noise in the torque measurement reading. The antenna is currently fastened to the bearing housing, placing it close to a lot of metal material that seems to interfere with the signal being transmitted from the telemetry collar to the antenna. It is possible to send the coupling and telemetry to ATI in order to turn the collar around and place the antenna further from the bearing housing. A more simple option could be to add rubber facing to the side of the bearing housing, creating a barrier that will absorb noise from the bearings. Another source of noise is in the wiring from the transmitter to the DAQ system. Including more ground connections as well as investigating signal conditioning will improve the accuracy of the reading output at the DAQ.

The recommendations listed above will help to move the project forward at Flowserve's Temecula site. With regards to the S.E.A.L.S. team, the Flowserve Seal Torque Testing System is complete.

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²¹"Silicone Rubber." *Azom Materials Properties*. Azom, n.d. Web. 02 Mar. 2014.

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Appendix A1:
Quality Function Deployment (QFD)

QFD: House of Quality

Project:

Revision:

Date: _____

Correlations
Positive +
Negative -
No Correlation

Relationships
Strong ●
Moderate ○
Weak ▽

Direction of Improvement	▲	◇	▼
Maximize			
Target			
Minimize			

Row #	Weight Chart	WHO: Customers			
		Relative Weight	Flowerave	On-site Engineer	Process Industries
1	<div><div></div></div>	6%	3	5	5
2	<div><div></div></div>	6%	3	5	5
3	<div><div></div></div>	6%	3	5	5
4	<div><div></div></div>	6%	3	5	5
5	<div><div></div></div>	5%	5	5	1
6	<div><div></div></div>	7%	5	5	5
7	<div><div></div></div>	7%	5	5	5
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9	<div><div></div></div>	7%	5	5	4
10	<div><div></div></div>	5%	4	5	2
11	<div><div></div></div>	6%	3	5	5
12	<div><div></div></div>	7%	4	5	5
13	<div><div></div></div>	4%	4	3	1
14	<div><div></div></div>	3%	5	1	1
15	<div><div></div></div>	7%	5	5	5
16	<div><div></div></div>	4%	3	5	1
17	<div><div></div></div>	5%	4	5	1

[illegible]

Appendix A2:
Pugh Matrices

Table 1. Torque measurement Pugh matrix.

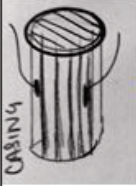
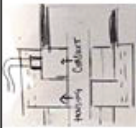
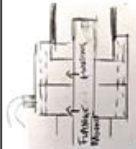
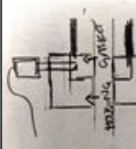
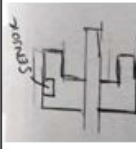
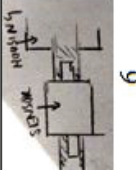
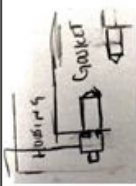
Concept	 1	 2	 3	 4	 5	 6	 7
Criteria							
Cost	D	-	-	-	-	-	-
Size		-	-	-	+	-	+
Wireless	A	S	S	S	+	S	S
Noise		S	+	S	-	S	-
Internal	T	+	S	+	+	+	-
Direct to Gasket		+	S	+	+	S	+
Σ^+	U	2	1	2	4	1	2
Σ^-		2	2	2	2	2	3
Σ^+	M	2	3	2	0	3	1

Table 2. Leakage measurement Pugh matrix.




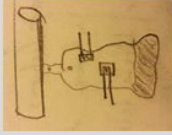
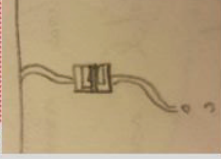


	Existing (None)	Optical Sensing	Kitchen Sink Plumbing	Mass Balance	Elongation of bladder (strain gauges)	IV w/flowmeter	Load sensor tube	Graduated cylinder
								
Accurately measure leakage	D	+	+	+	+	+	+	+
Easy and fast to read	D	+	-	+	+	0	+	+
DAQ Output	D	+	0	+	+	+	+	0
Safety in event of failure	D	-	-	0	-	0	-	-
Cost	D	-	-	-	-	-	-	0
Manufacturability	D	-	-	-	-	-	-	-
Serviceability	D	-	-	-	-	-	-	0
Doesn't hinder apparatus mobility	D	-	-	-	0	0	0	0
Doesn't cause hysteresis	D	-	0	0	0	0	0	0
Support fluid to 200F	D	0	0	0	0	0	0	0
Sum +	0	3	1	3	3	2	3	2
Sum -	0	6	6	4	4	3	4	2
Sum 0	0	1	3	3	3	5	3	6

Table 3. Pressure vessel Pugh matrix.

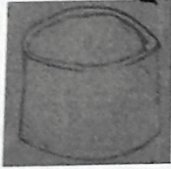





Bodin Rojanachaichanin 2/18/2014		Pugh Matrix					
Concept/ Criteria							
	1	2	3	4	5	6	
Withstand up to 200 psig	D	+	+	+	S	+	
Hold Temperature up to 200 F		+	+	+	S	+	
Allows for viewing of seal interface	A	-	S	S	+	-	
Cost		S	S	S	-	S	
Manufacturability	T	-	-	-	S	S	
Design for Assembly		S	S	-	+	-	
Positive Sum	U	2	2	2	2	2	
Negative Sum		2	1	2	1	0	
Total Sum	M	0	1	0	1	0	

Table 4. Mobility Pugh matrix.

	8	9	10	11	12	13	14
Criteria							
1	+	+	+	+	+	+	+
2	-	-	-	-	big -	-	-
3	S	S	S	S	S	S	S
4	-	big -	-	-	big -	-	big -
5	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+
7	-	+	big -	-	+	-	+
8	-	+	-	+	+	+	-
9	+	+	+	+	-	+	-
$\Sigma +$	4	6	4	5	5	5	5
$\Sigma -$	4	2	4	3	3	3	3
ΣS	1	1	1	1	1	1	1

Appendix A3:
Decision Matrices

Table 1. Torque measurement criteria weighting.

		Installation	Parasitic Loads	Maintenance	Hysteresis	Linearity	Measurement Acquisition
		F	E	D	C	B	A
Measurement Acquisition	A	F	E	A	C	B	
Repeatability	B	B	B	B	C		
Hysteresis	C	C	C	C			
Maintenance	D	D	E				
Parasitic Loads	E	E					
Installation	F						

	Totals	Totals+1	Percent	Rounded
A	1	2	10	10
B	3	4	20	20
C	5	6	30	30
D	1	2	10	10
E	3	4	20	20
F	1	2	10	10
		5	100	100

Table 2. System orientation criteria weighting.

	Allows for various leakage detection systems to be implemented	Size of system	Ease of resetting system	Allows for optimal torque sensor to be implemented	Ease of camera mounting
Allows for various leakage detection systems to be implemented	1	0	0	2	1
Size of system	2	1	2	2	2
Ease of resetting system	2	0	1	2	1
Allows for optimal torque sensor to be implemented	0	0	0	1	0
Ease of camera mounting	1	0	1	2	1
Total	6	1	4	9	5
Weights	0.24	0.04	0.16	0.36	0.2
Percentage	24	4	16	36	20

Table 3. Pressure vessel criteria weighting.

	Reading of torque measurement	Camera visibility of seal interface	Ease of assembly	Bearing Housing Design	Manufacturability	Human visibility of seal interface
Reading of torque measurement	1	0	0	0	0	0
Camera visibility of seal interface	2	1	0	0	0	0
Ease of assembly	2	2	1	0	0	2
Bearing Housing Design	2	2	2	1	2	2
Manufacturability	2	2	2	0	1	2
Human visibility of seal interface	2	2	0	0	0	1
Total	11	9	5	1	3	7
Weights	0.31	0.25	0.14	0.03	0.08	0.19
Percentage	30.56	25.00	13.89	2.78	8.33	19.44

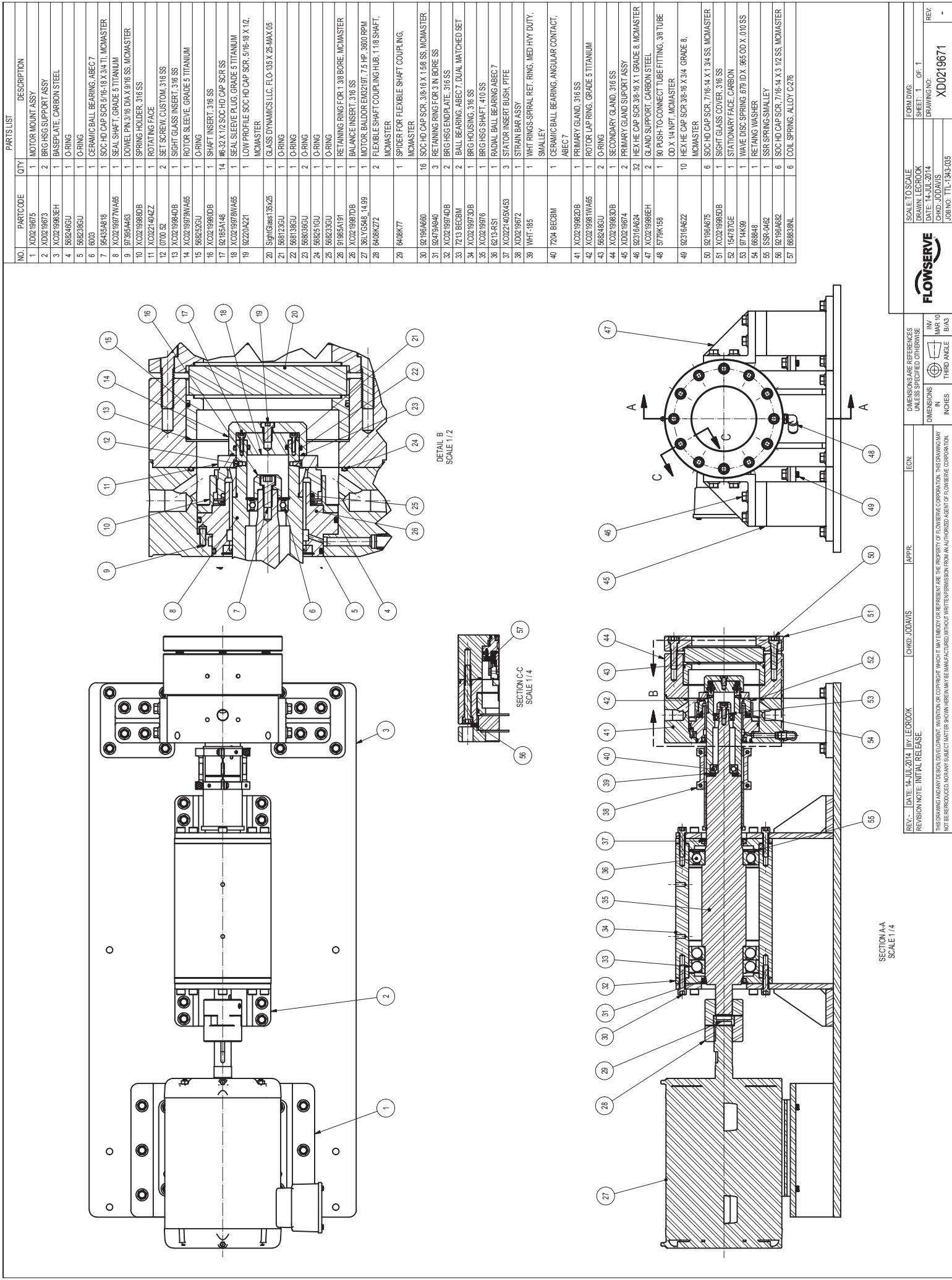
Table 4. Leakage measurement criteria weighting.

	Accurately Measure Leakage	DAQ Output	Cost	Manufacturability	Versatility
Accurately Measure Leakage	1	0	0	0	0
DAQ Output	2	1	0	0	0
Cost	2	2	1	1	1
Manufacturability	2	2	1	1	2
Versatility	2	2	1	1	1
Totals	9	7	3	3	4
Weight	0.35	0.27	0.12	0.12	0.15
Percentage	34.62	26.92	11.54	11.54	15.38

Table 5. Mobility criteria weighting.

	Cost of Materials	Manufacturability	Assembly/moving time	Ease of Mobility	Keeps System Stationary in Testing
Cost of materials	1	1	1	2	2
Manufacturability	1	1	1	1	2
Assembly/moving time	1	1	1	1	2
Ease of mobility	0	1	1	1	2
Keeps system stationary	0	0	2	0	1
Total	3	4	6	5	9
Weights	0.11	0.15	0.22	0.19	0.33

Appendix B1:
Final Design Drawings

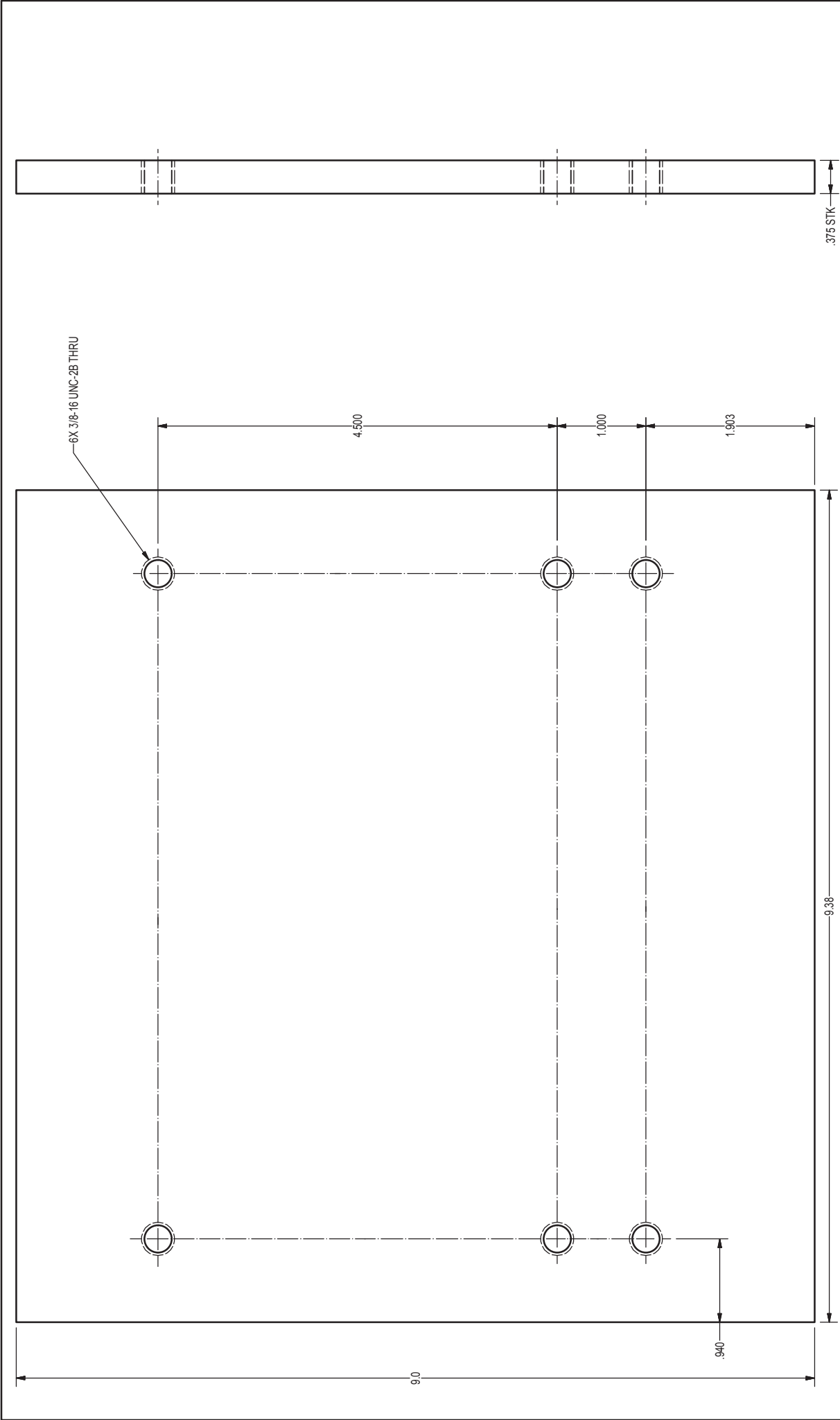


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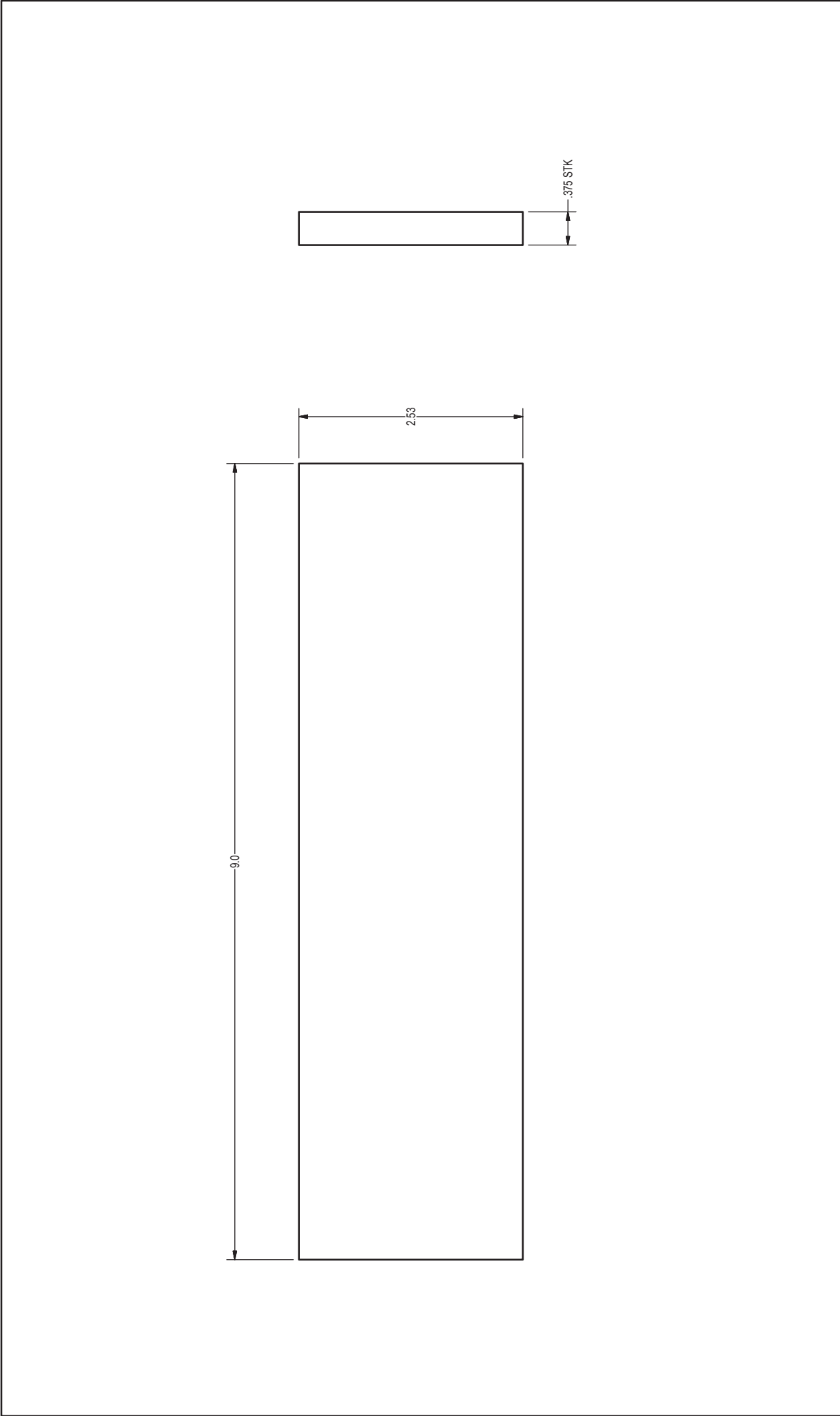
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45	X00219874	2
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49	82316A822	10
50	521654146	6
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52	1547810E	1
53	9714K39	1
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SECTION A-A
SCALE 1/4

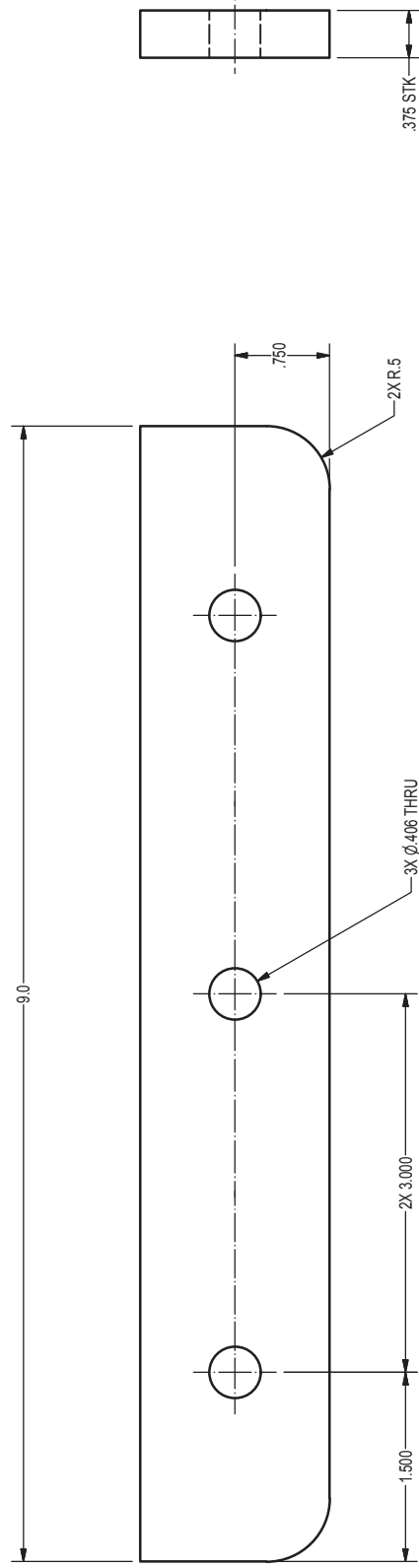
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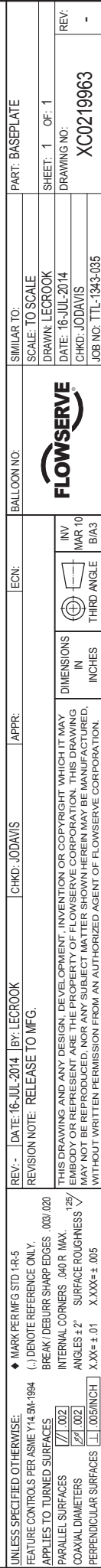
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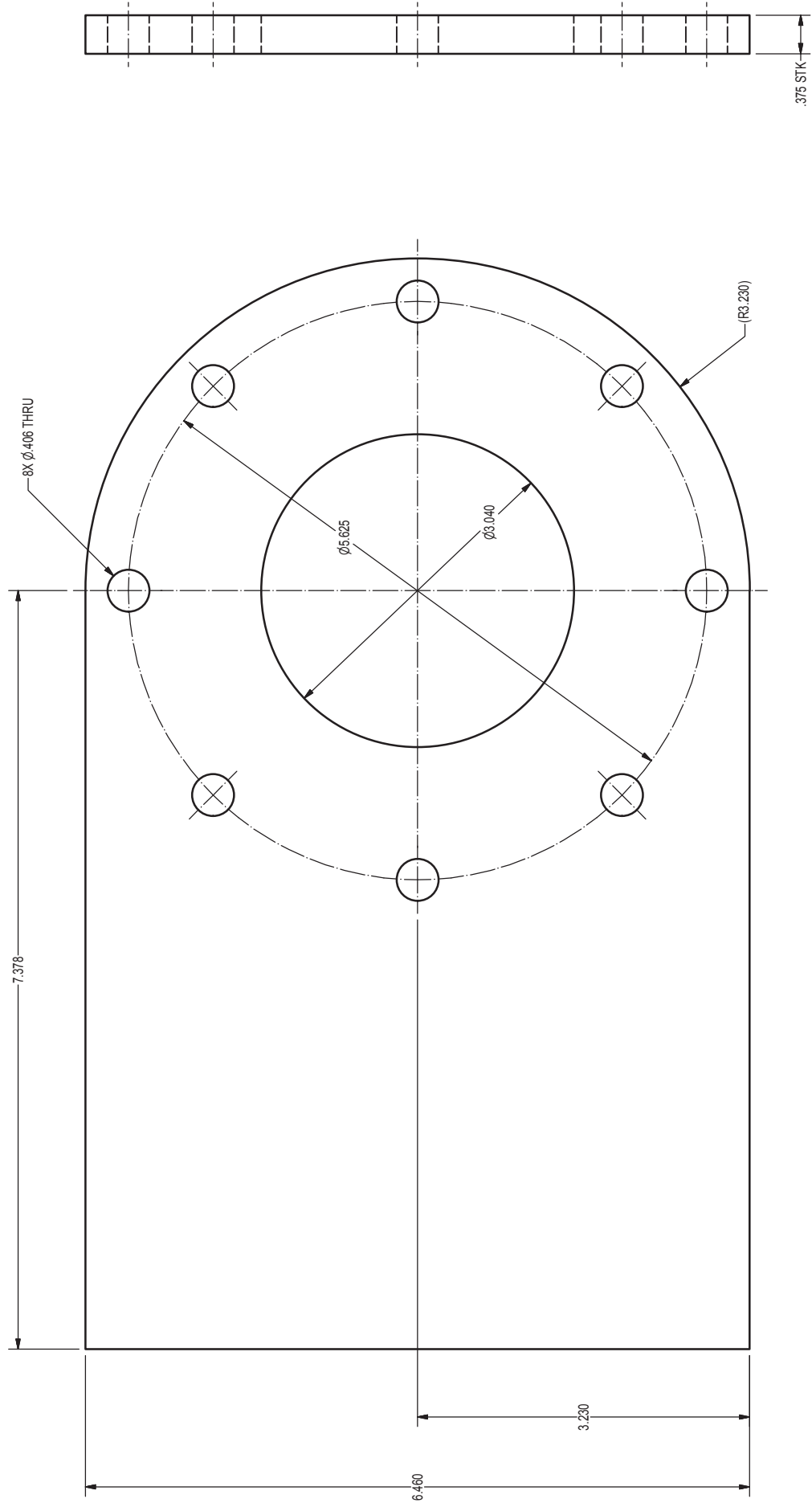


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 ANGLES ± 2° SURFACE ROUGHNESS V
 X.XX ± .01 X.XXX ± .005

FEATURE CONTROLS PER ASME Y14.5M-1994
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 COAXIAL DIAMETERS --- .002
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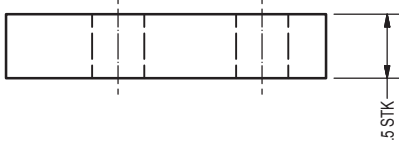
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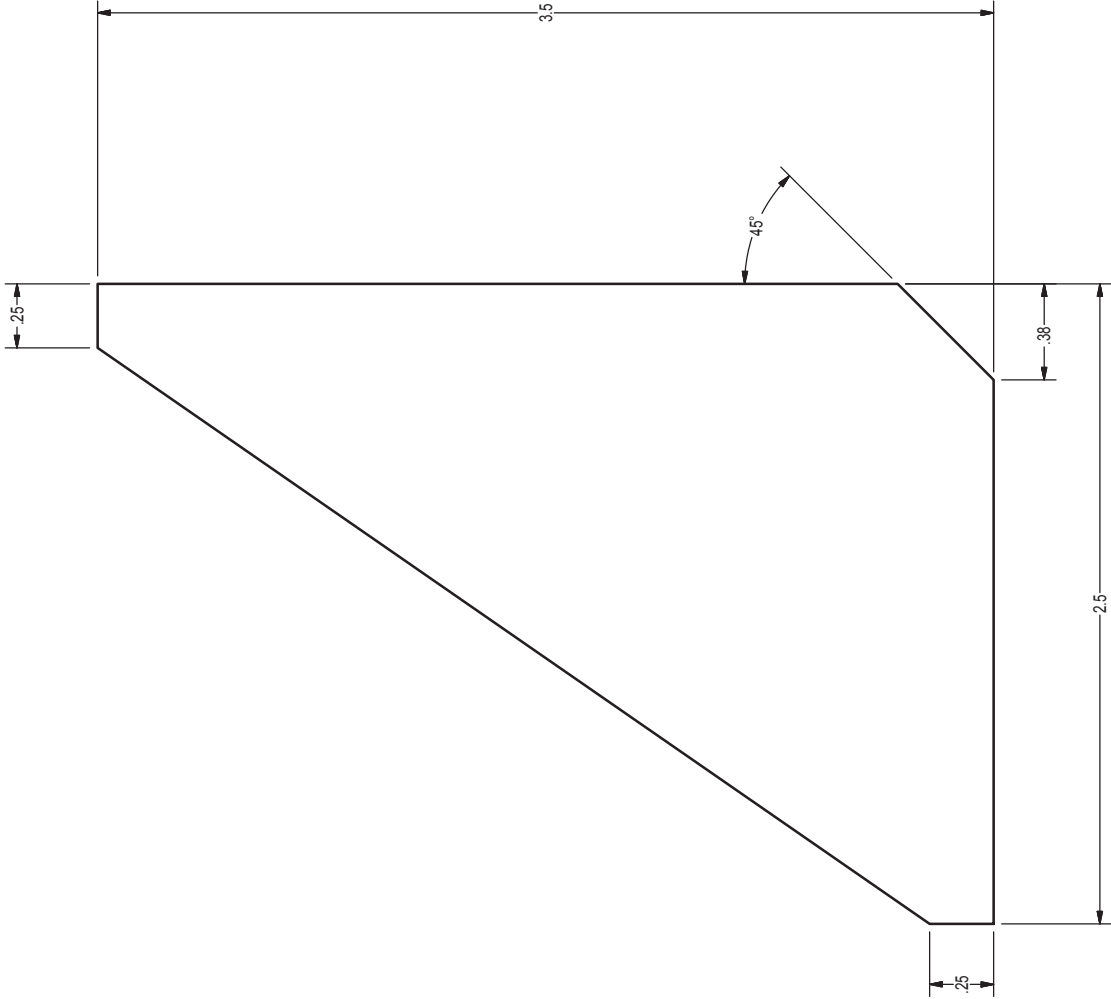
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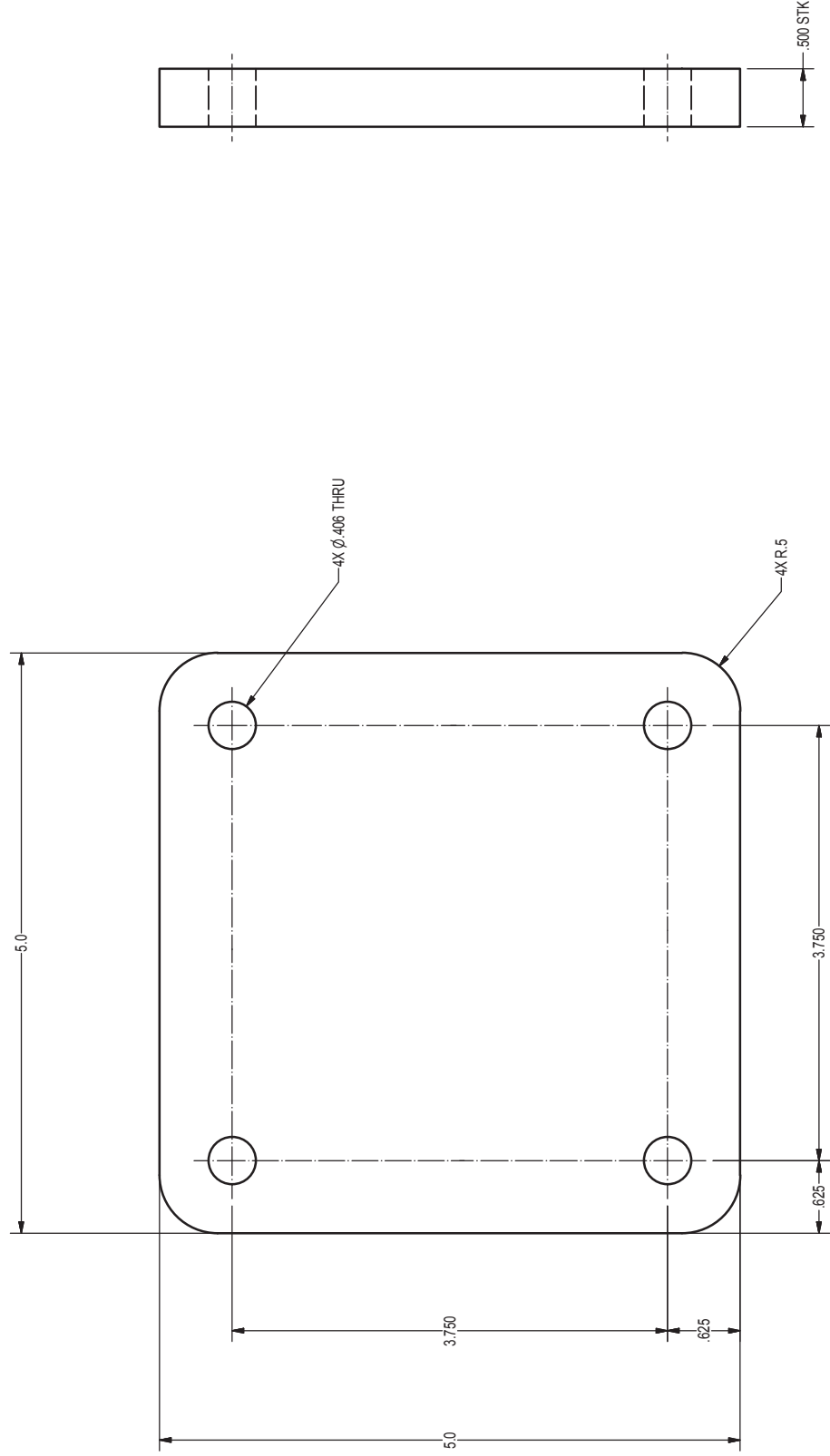
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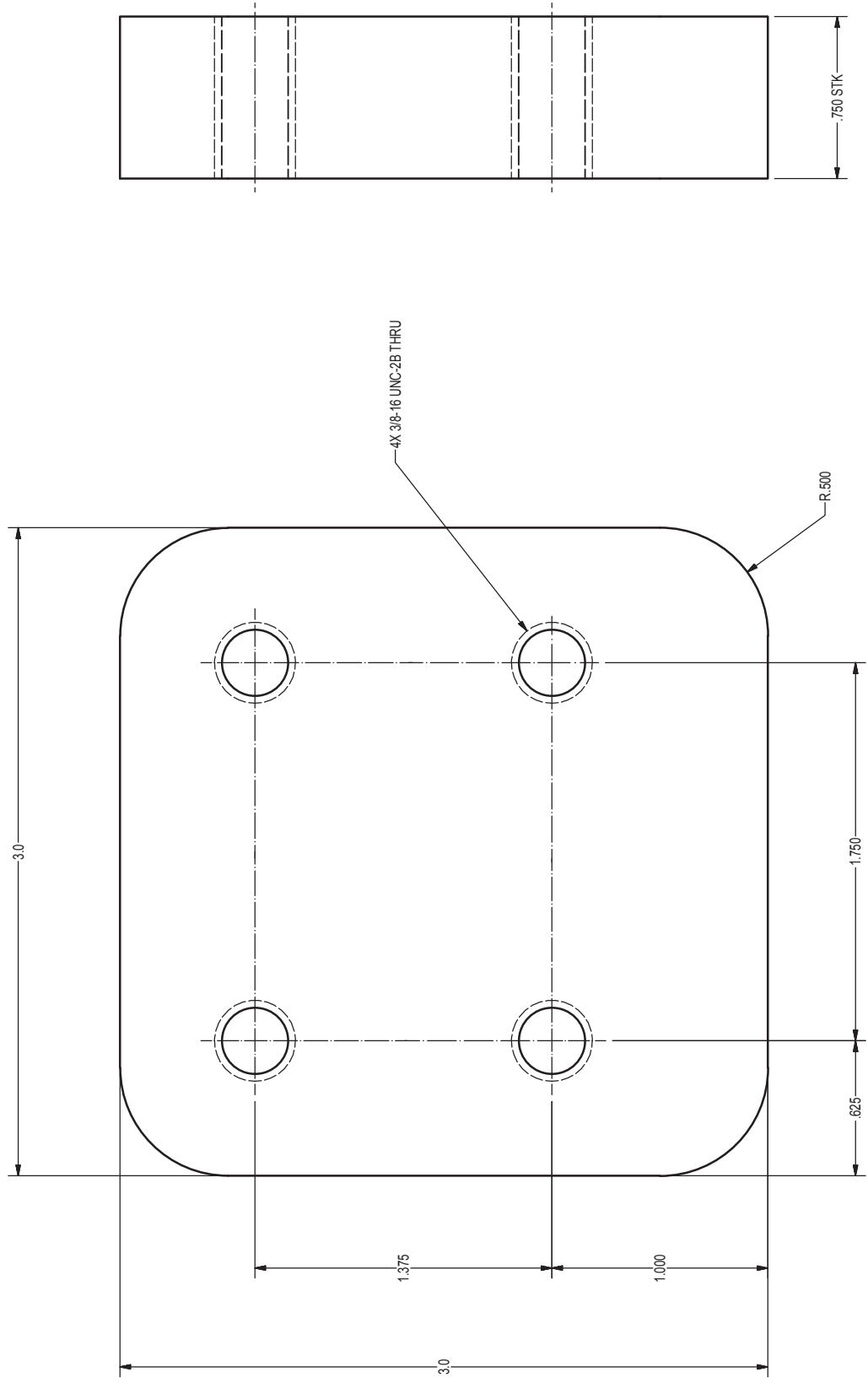
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PARALLEL SURFACES $\frac{1}{16}$.002 COAXIAL DIAMETERS $\frac{1}{32}$.002 PERPENDICULAR SURFACES $\frac{1}{16}$.005/INCH		DIMENSIONS IN INCHES  THIRD ANGLE		 INV MAR 10 B1A3			



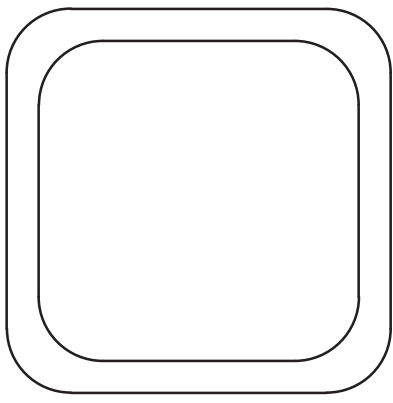
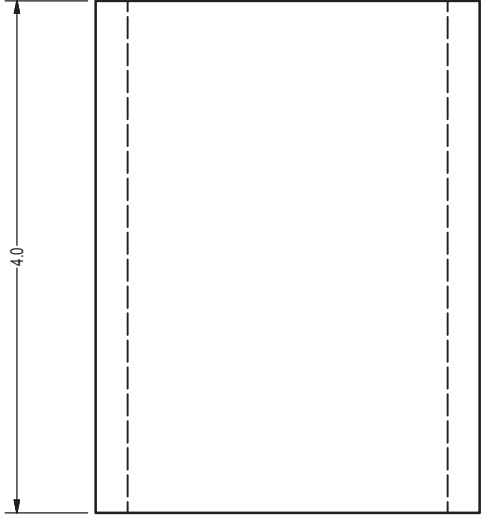
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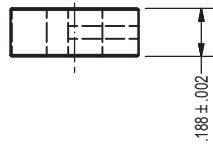
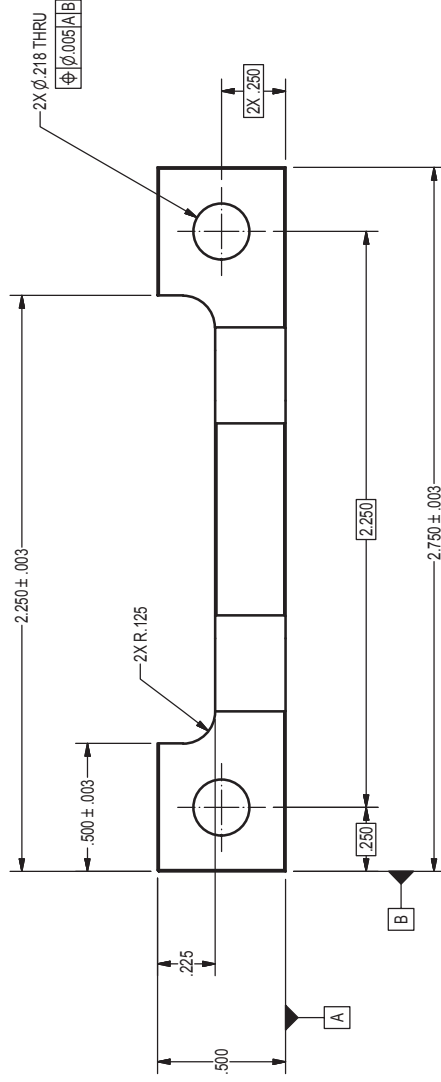
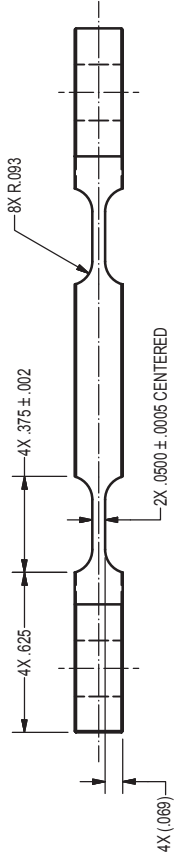
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FEATURE CONTROLS PER ASME Y14.5M-1994 APPLIES TO TURNED SURFACES PARALLEL SURFACES COAXIAL DIAMETERS PERPENDICULAR SURFACES		REVISION NOTE: RELEASE TO MFG		DIMENSIONS IN INCHES		INV MAR 10 THIRD ANGLE B/A3		SHEET: 1 OF: 1 DRAWING NO: XC0219968		REV: -	



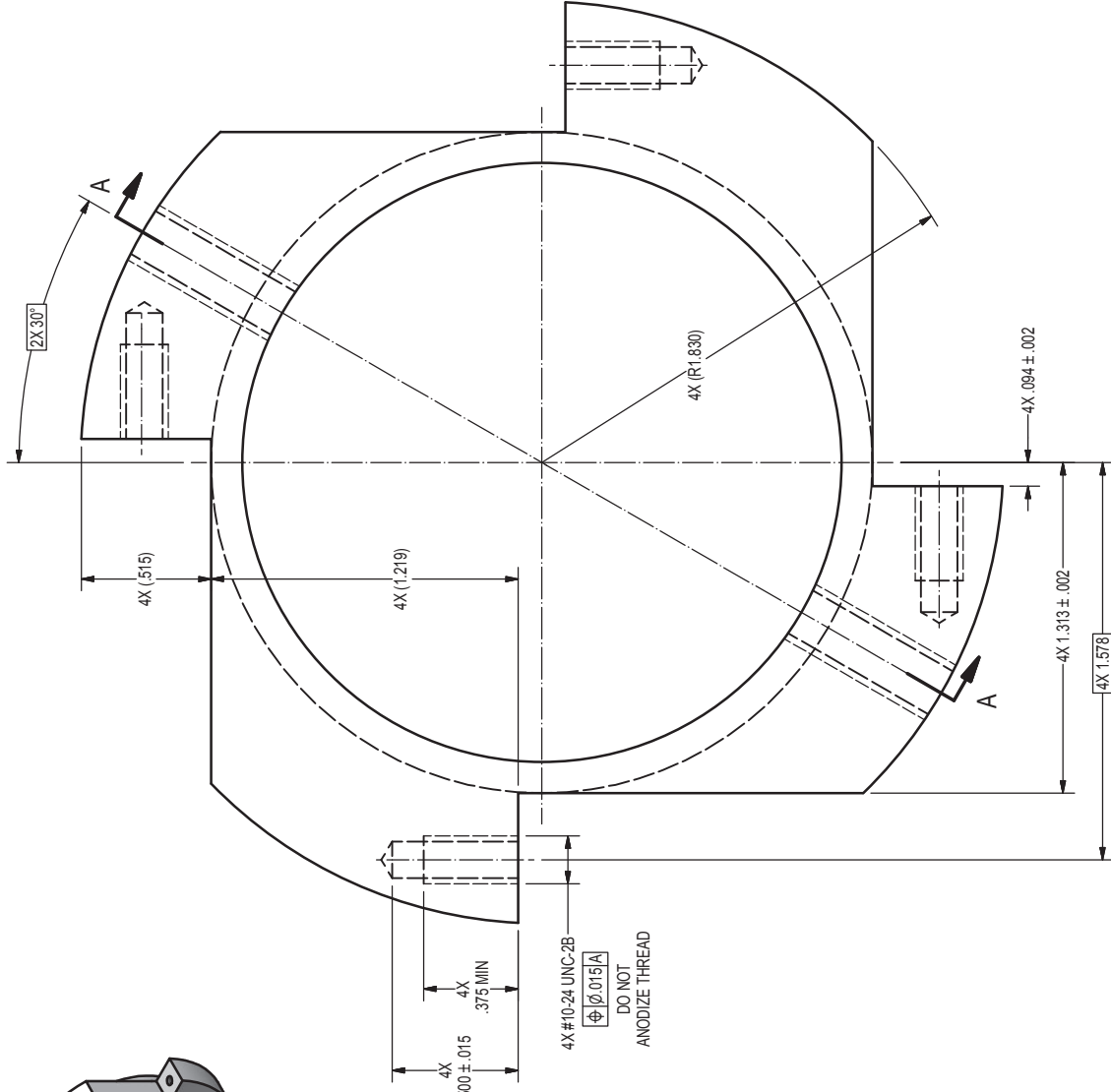
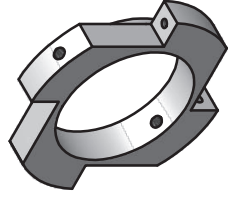
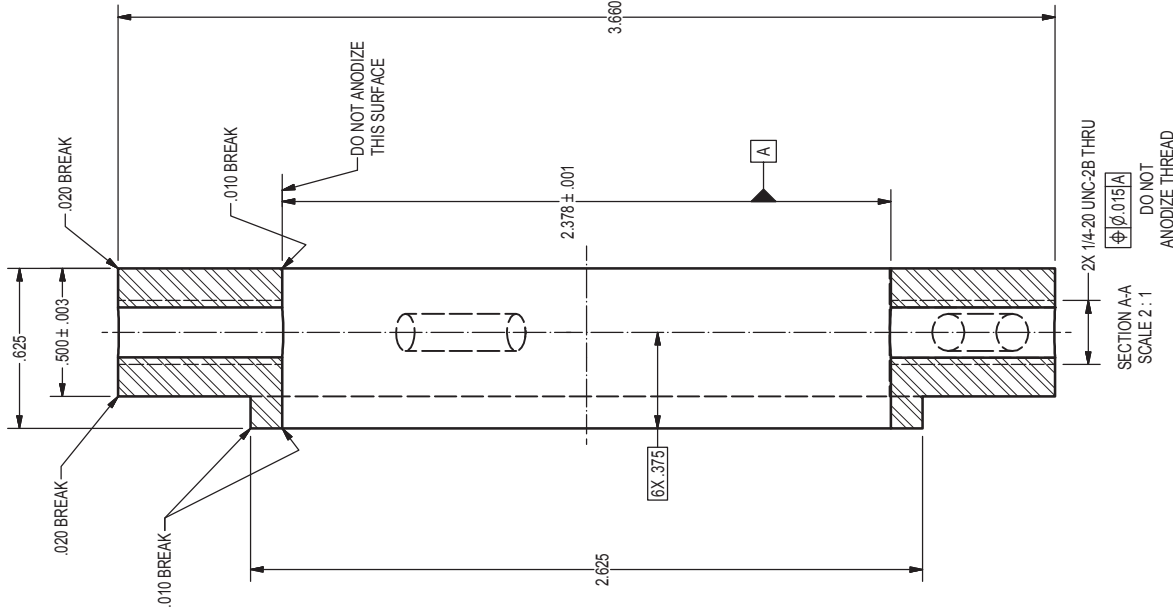
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UNLESS SPECIFIED OTHERWISE:		♦ MARK PER MFG STD 1P-5	REV: -	DATE: 16-JUL-2014	BY: LECROOK	CHKD: JODAVIS	APPR:	ECN:	BALLOON NO:	SIMILAR TO:	PART: STRAIN BAR
FEATURE CONTROLS PER ASME Y14.5M-1994		(.) DENOTE REFERENCE ONLY.	REVISION NOTE: RELEASE TO MFG.								SCALE: TO SCALE
APPLIES TO TURNED SURFACES		BREAK / DEBURR SHARP EDGES .003/.020									DRAWN: LECROOK
PARALLEL SURFACES		INTERNAL CORNERS .040 R MAX.									DATE: 16-JUL-2014
COAXIAL DIAMETERS		ANGLES ± 2° SURFACE ROUGHNESS V									CHKD: JODAVIS
PERPENDICULAR SURFACES		X.XX ± .01 X.XXX ± .005									DRAWING NO:
											XC0219971
											REV: -
											JOB NO: TTL-1343-035








INVT
MAR 10
THIRD ANGLE
B/A3

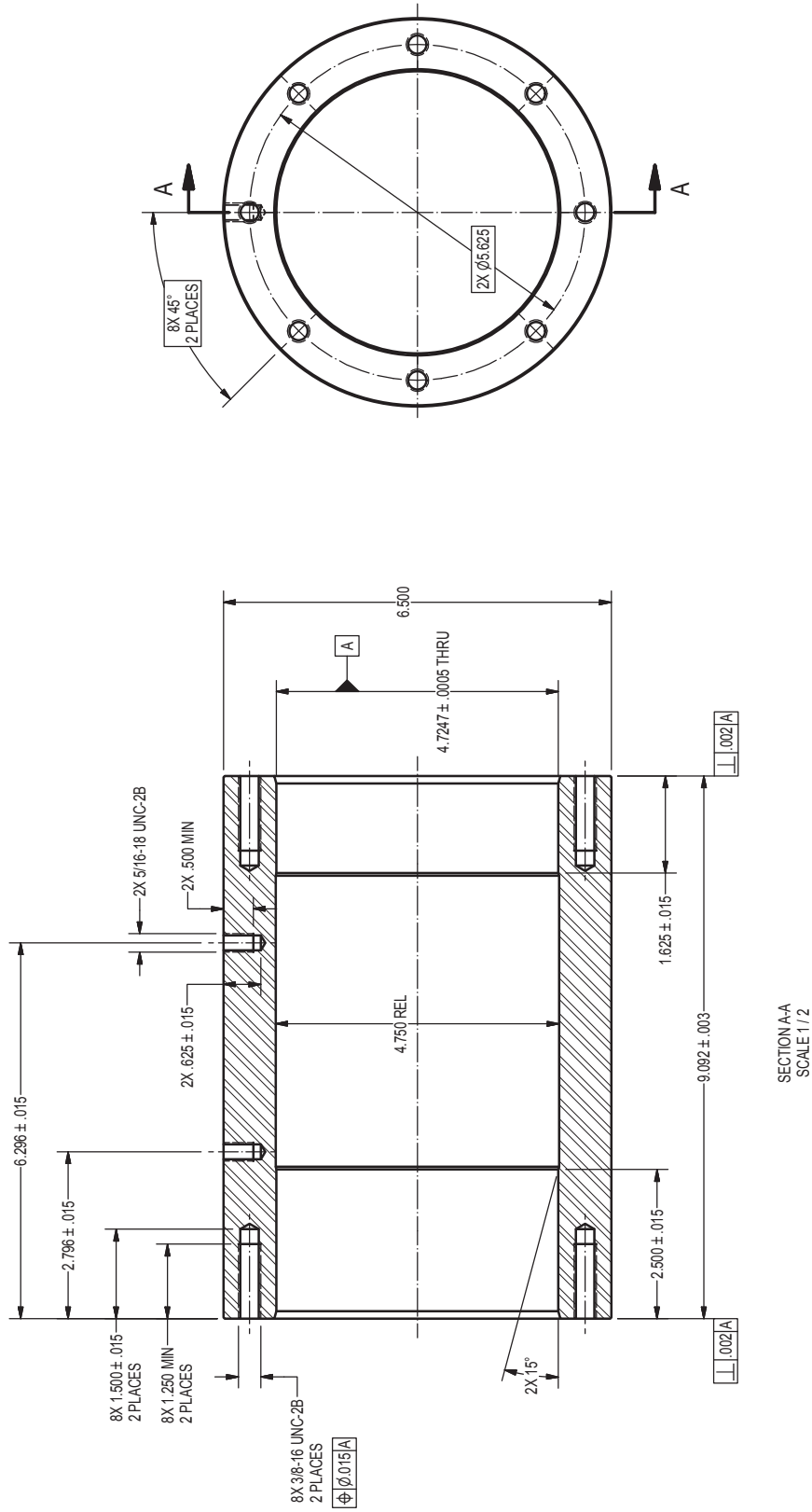


1. BLACK ANODIZE PER MIL-8825 TYPE II.

UNLESS SPECIFIED OTHERWISE:										REV. A
♦ MARK PER MFG STD 14-5										XC0219972
(.) DENOTE REFERENCE ONLY.										JOB NO: TTL-1343-035
BREAK / DEBURR SHARP EDGES .003/.020										REV: A
APPLIES TO TURNED SURFACES										DRAWING NO: XC0219972
INTERNAL CORNERS .040 R MAX.										SHEET: 1 OF: 1
ANGLES > 45° SURFACE ROUGHNESS ✓										DRAWING NO: XC0219972
PARALLEL SURFACES  .002										JOB NO: JODAVIS
COAXIAL DIAMETERS  .002										THIRD ANGLE
PERPENDICULAR SURFACES  .005INCH										MAR 10
										B/A3
										INV
										DRAWING NO: XC0219972
										SHEET: 1 OF: 1
										SCALE: TO SCALE
										DRAWN: LECROOK
										DATE: 16-JUL-2014
										CHKD: JODAVIS
										JOB NO: TTL-1343-035
										REV: A

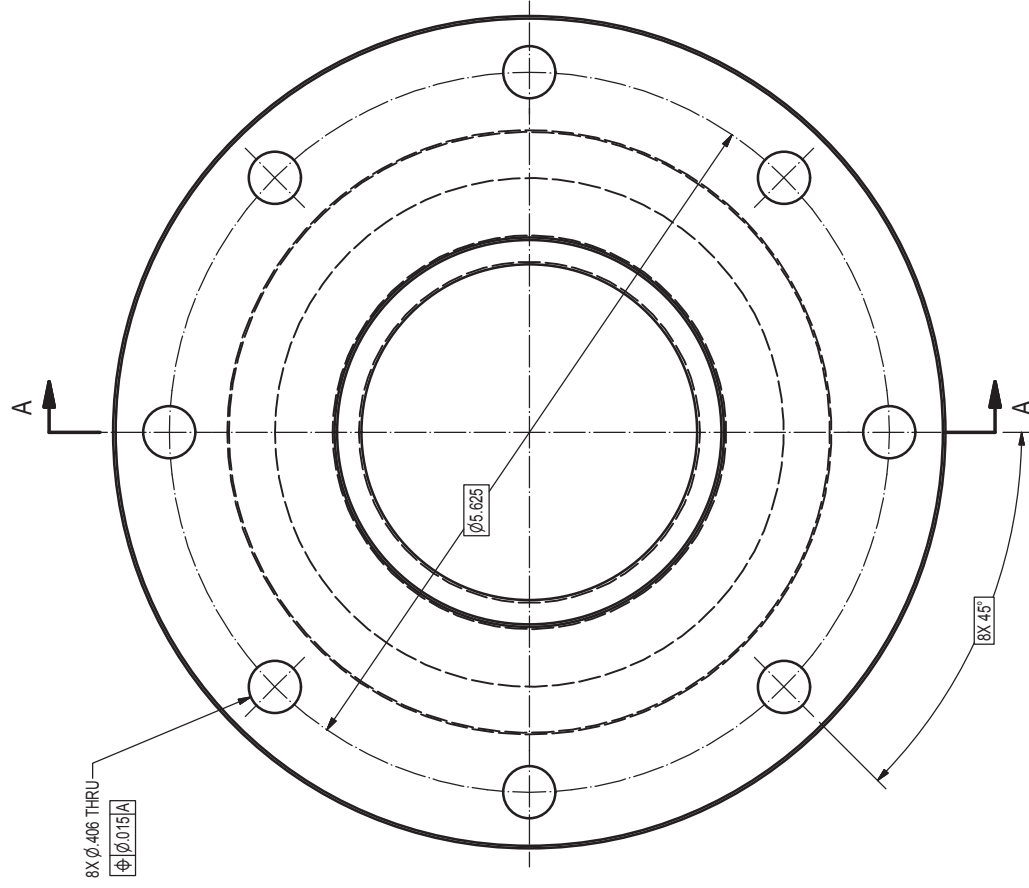
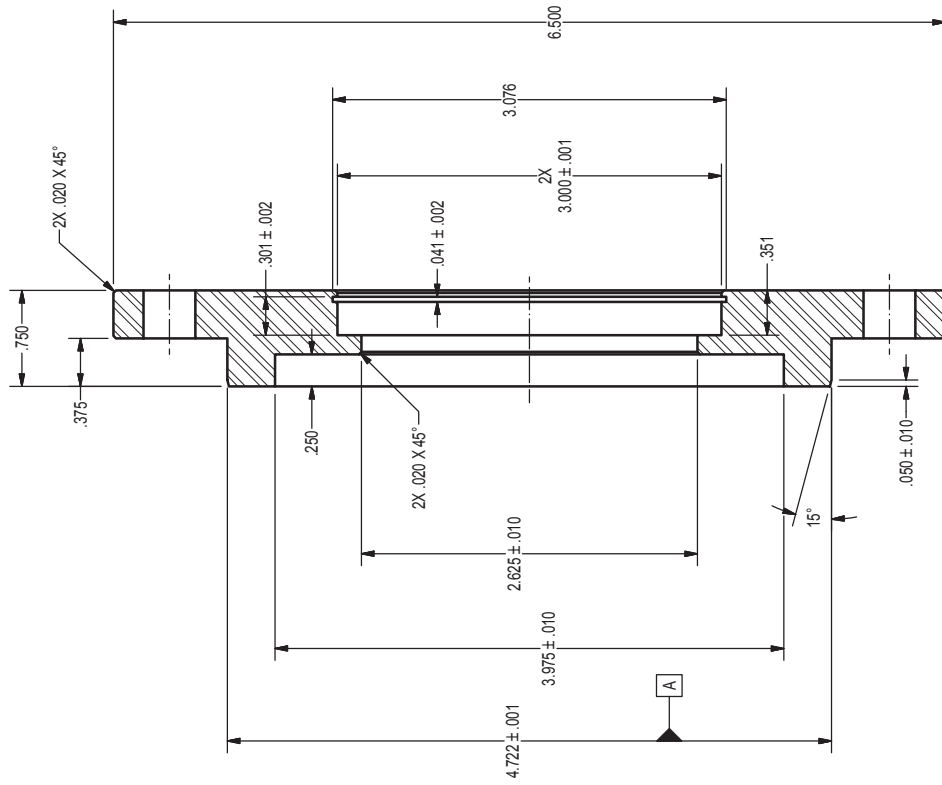
UNLESS SPECIFIED OTHERWISE:		♦ MARK PER MFG STD 14-5		REV. A	
(.) DENOTE REFERENCE ONLY.		BREAK / DEBURR SHARP EDGES .003/.020		XC0219972	
APPLIES TO TURNED SURFACES		INTERNAL CORNERS .040 R MAX.		JOB NO: JODAVIS	
INTERNAL CORNERS .040 R MAX.		ANGLES > 45° SURFACE ROUGHNESS ✓		THIRD ANGLE	
PARALLEL SURFACES  .002		COAXIAL DIAMETERS  .002		MAR 10	
COAXIAL DIAMETERS  .002		PERPENDICULAR SURFACES  .005INCH		B/A3	
PERPENDICULAR SURFACES  .005INCH				INV	
				DRAWING NO: XC0219972	
				SHEET: 1 OF: 1	
				SCALE: TO SCALE	
				DRAWN: LECROOK	
				DATE: 16-JUL-2014	
				CHKD: JODAVIS	
				JOB NO: TTL-1343-035	
				REV: A	



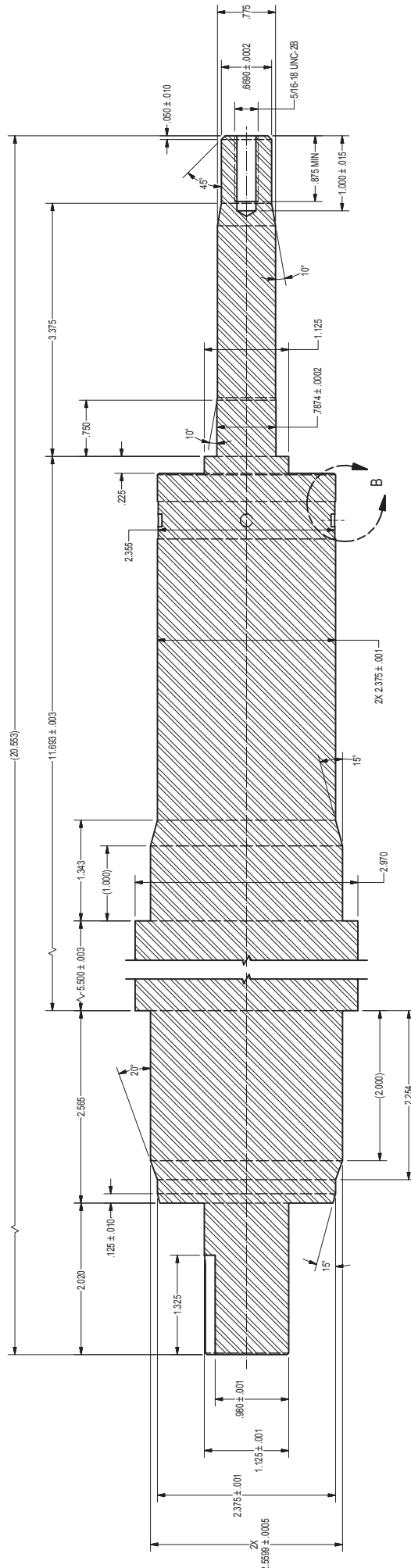
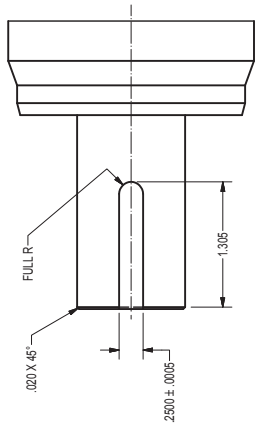


UNLESS SPECIFIED OTHERWISE:		♦ MARK PER MFG STD 1R-5	♦ DATE: 16-JUL-2014	BY: LECROOK	CHKD: JODAVIS	APPR:	ECN:	BALLOON NO:	SIMILAR TO:	PART: BRG HOUSING
FEATURE CONTROLS PER ASME Y14.5M-1994		(.) DENOTE REFERENCE ONLY.	REVISION NOTE: RELEASE TO MFG.							
APPLIES TO TURNED SURFACES		BREAK / DEBURR SHARP EDGES .003/.020	SCALE: TO SCALE							
PARALLEL SURFACES		INTERNAL CORNERS .040 R MAX.	DRAWN: LECROOK							
COAXIAL DIAMETERS		ANGLES ± 2° SURFACE ROUGHNESS 125	DATE: 16-JUL-2014							
PERPENDICULAR SURFACES		X.XX ± .01 X.XXX ± .005	CHKD: JODAVIS							
			JOB NO: TTL-1343-035							
			DRAWING NO: XC0219973							
			SHEET: 1 OF 1							
			REV: -							

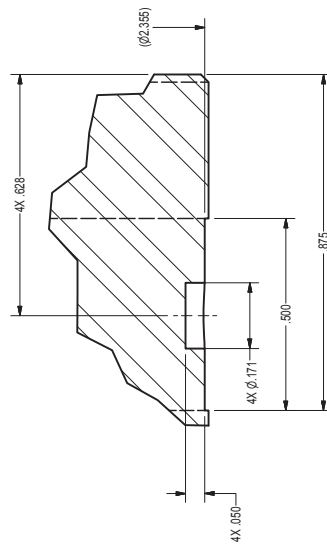
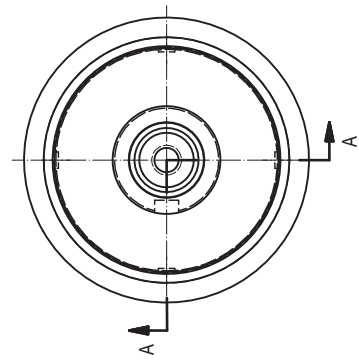




<p>◆ MARK PER MFG STD 1R-5 (.) DENOTE REFERENCE ONLY. BREAK / DEBURR SHARP EDGES. 003/ 020</p> <p>INTERNAL CORNERS .040 R MAX. ANGLES ±.2° SURFACE ROUGHNESS ✓ X.XXX ± .01 X.XXX ± .005</p> <p>129</p>	<p>REV: - DATE: 16-JUL-2014 BY: LECROOK REVISION NOTE: RELEASE TO MFG.</p>		<p>APPR: CHKD: JODAVIS</p>		<p>ECN:</p>		<p>BALLOON NO:</p>		<p>SIMILAR TO:</p>		<p>PART: BRG HSG ENDP LIT. SEAL SIDE</p>	
	<p>UNLESS SPECIFIED OTHERWISE: FEATURE CONTROLS PER ASME Y14.3M-1994 APPLIES TO TURNED SURFACES</p>		<p>SCALE: TO SCALE</p>		<p>DRAWN: LECROOK</p>		<p>SHEET: 1 OF: 1</p>		<p>DRAWING NO:</p>		<p>REV:</p>	
	<p>PARALLEL SURFACES \parallel .002 COAXIAL DIAMETERS \varnothing .001 PERPENDICULAR SURFACES \perp .005 INCH</p>		<p>DIMENSIONS IN INCHES</p>		<p>INV MAR 10 THIRD ANGLE B/A3</p>		<p>FLOWSERVE</p>		<p>CHKD: JODAVIS JOB NO: TTL-1343-035</p>		<p>XC0219974</p>	

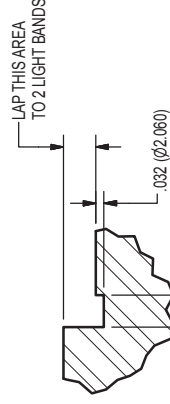
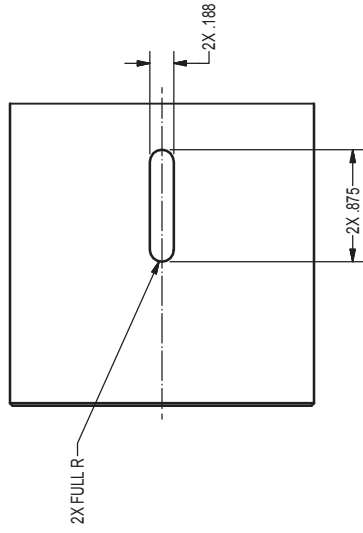


SECTION A-A
SCALE 1:1

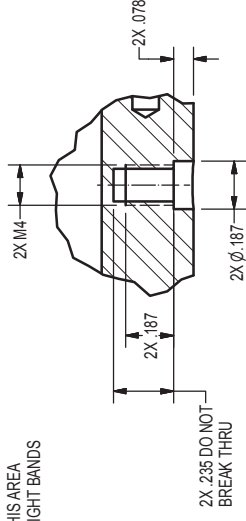


DETAIL B
SCALE 4:1

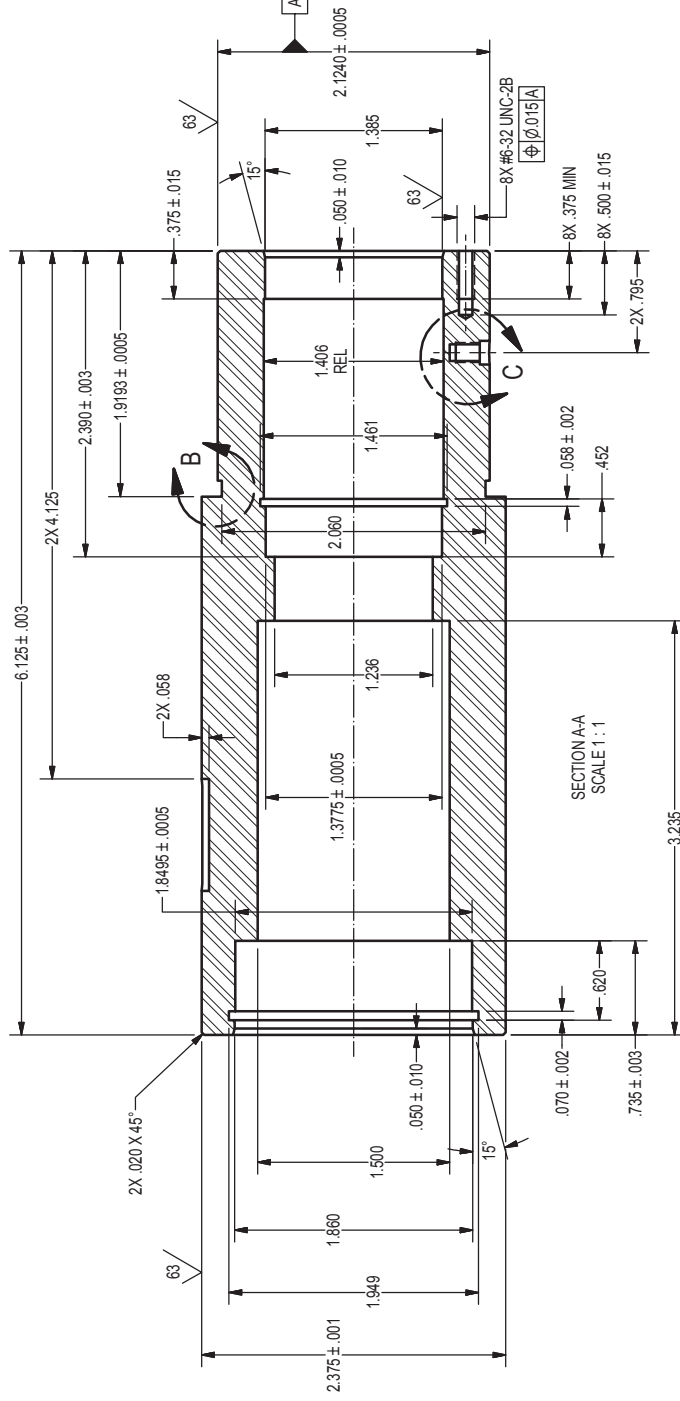
UNLESS SPECIFIED OTHERWISE: FEATURE CONTROLS PER ASME Y14.4M-1994 APPLIES TO TURNED SURFACES PARALLEL SURFACES COAXIAL DIAMETERS PERPENDICULAR SURFACES				♦ MARK PER MFG STD 14-3 () DENOTE REFERENCE ONLY BREAK/DEBURR SHARP EDGES INTERNAL CORNERS .040 R MAX ANGLES ± 2° X.XXX ± .01				THIS DRAWING AND ANY DESIGN, DEVELOPMENT, INVENTION OR COPYRIGHT WHICH IT MAY CONTAIN IS THE PROPERTY OF FLOWSERVE CORPORATION. NO PART OF THIS DRAWING MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT WRITTEN PERMISSION FROM AN AUTHORIZED AGENT OF FLOWSERVE CORPORATION.				REV: - DATE: 16-JUL-2014 BY: LECROCK REVISION NOTE: RELEASE TO MFG.				CHKO: JODAVIS				APPR.				ECN				BALLOON NO.				SIMILAR TO:				PART: BRG HSG SHAFT				SCALE: TO SCALE				DRAWN: LECROCK				SHEET: 1 OF 1				DATE: 16-JUL-2014				CHKO: JODAVIS				DRAWING NO: X00219976				JOB NO: TTL-1343-005				REV				-			
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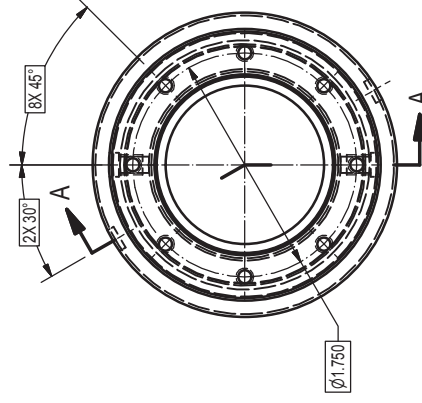
DETAIL B
SCALE 2:1



DETAIL C
SCALE 2:1



SECTION A-A
SCALE 1:1

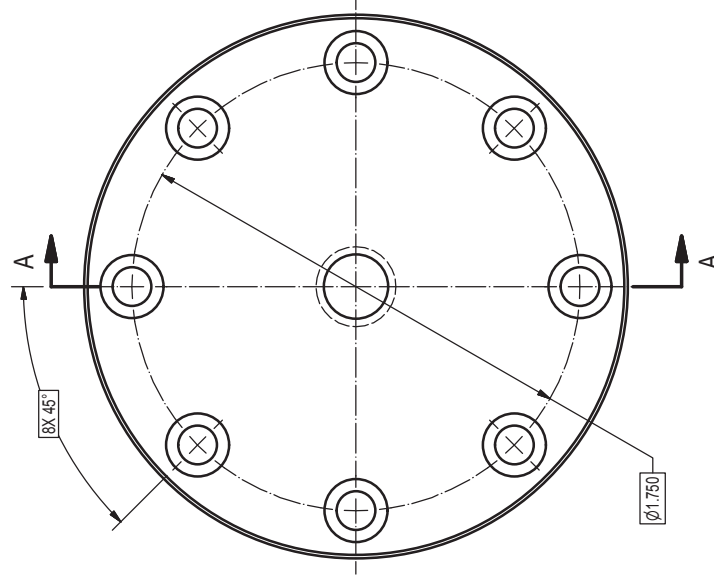


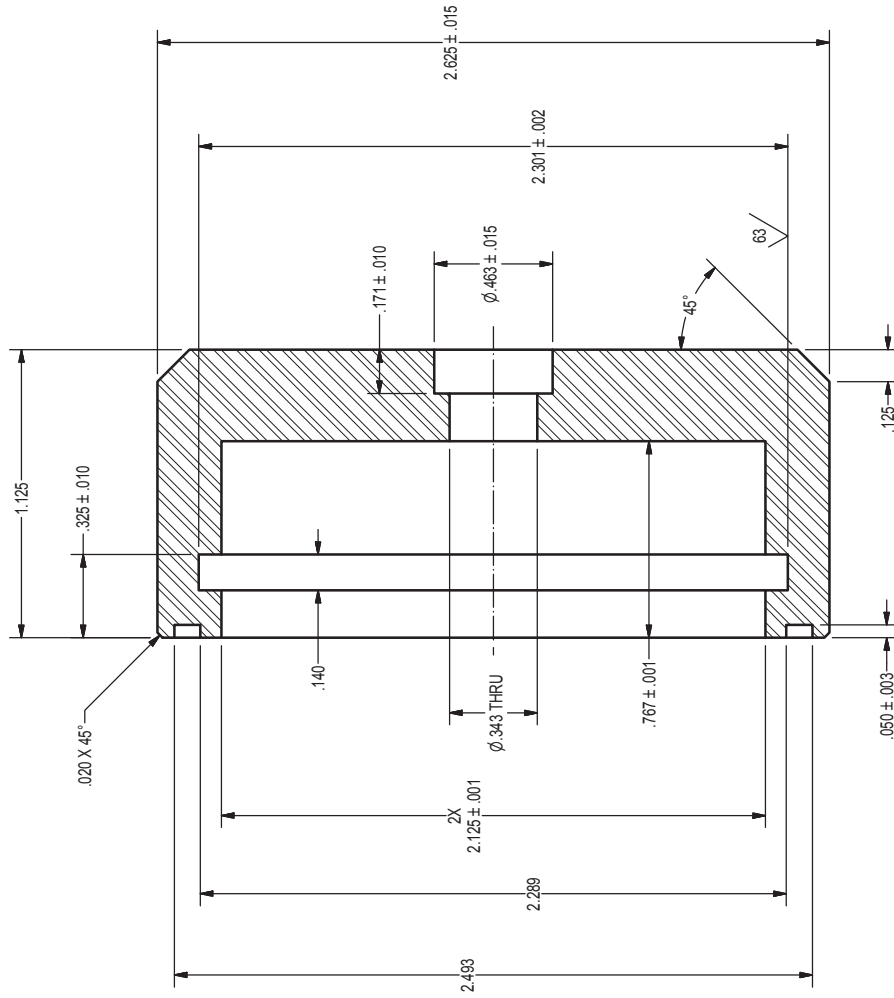
UNLESS SPECIFIED OTHERWISE: ♦ MARK PER MFG STD 14-5 (.) DENOTE REFERENCE ONLY. BREAK / DEBURR SHARP EDGES .003 .020 INTERNAL CORNERS .040 R MAX. ANGLES ± 2° SURFACE ROUGHNESS $\sqrt{125}$ X.XX ± .01 X.XXX ± .005	REV: -	DATE: 16-JUL-2014	BY: LECROOK	CHKD: JODAVIS	APPR:	ECN:	BALLOON NO:	SIMILAR TO:	PART: SEAL SHAFT
	REVISION NOTE: RELEASE TO MFG.							SCALE: TO SCALE	
	DRAWN: LECROOK							DATE: 16-JUL-2014	SHEET: 1 OF: 1
	CHKD: JODAVIS							DRAWING NO: XC0219977	REV: -



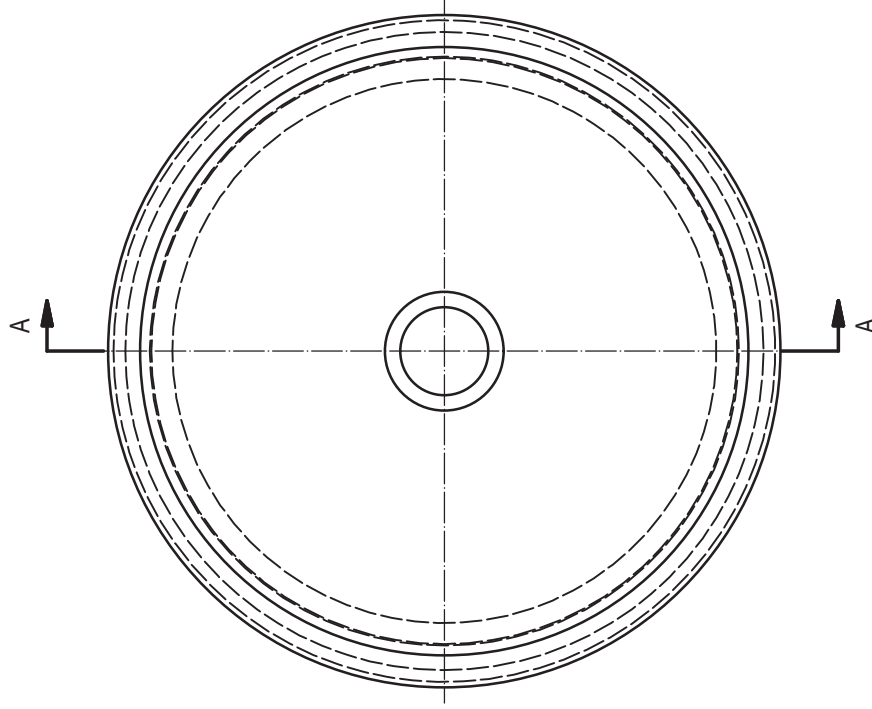
DIMENSIONS
IN
INCHES

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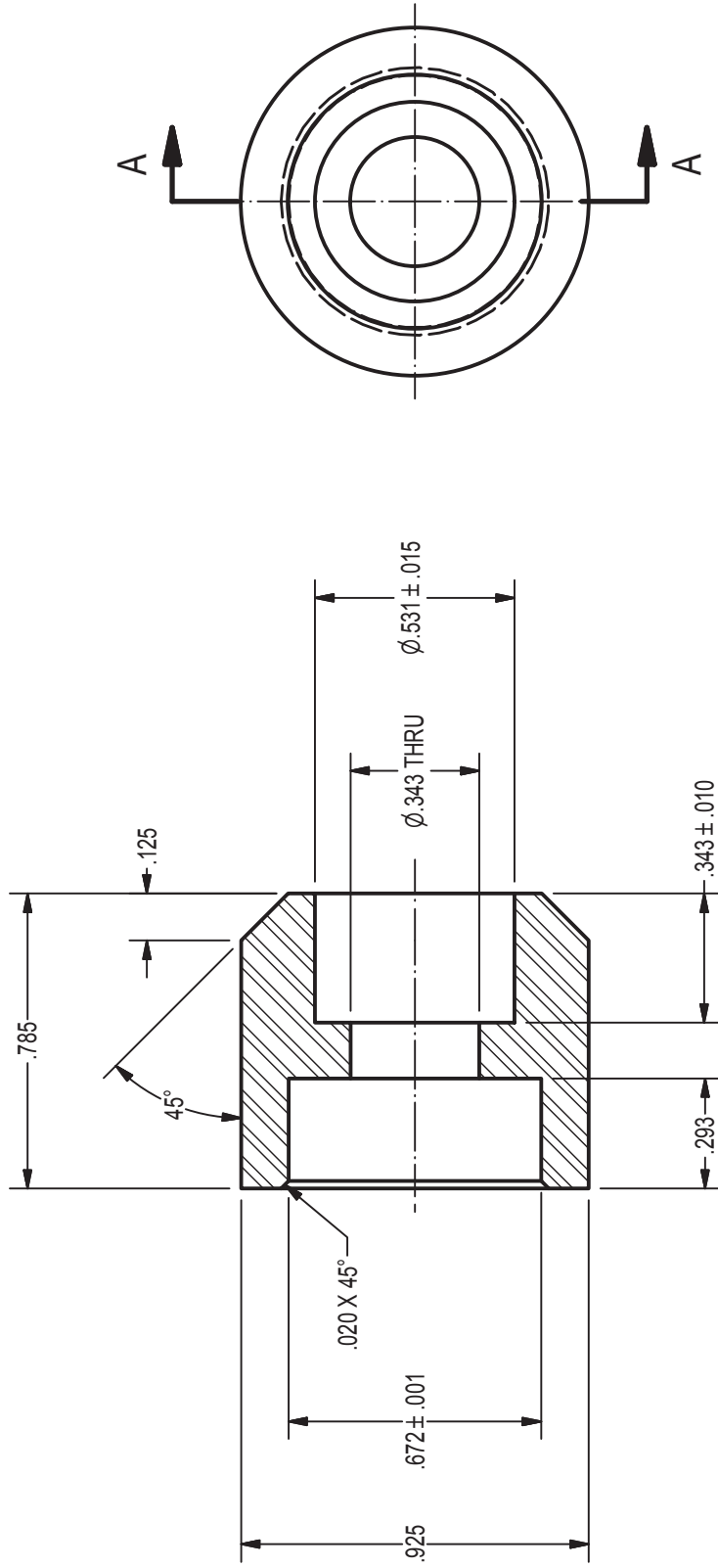


SECTION A-A
SCALE 2 : 1



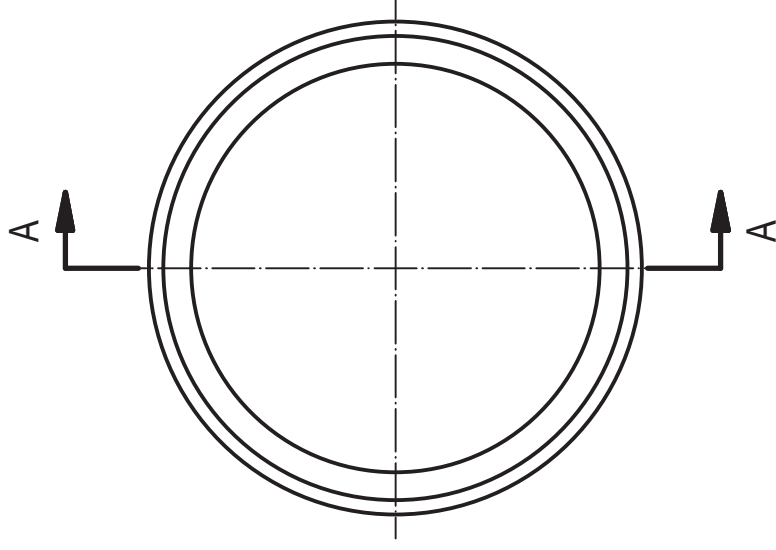
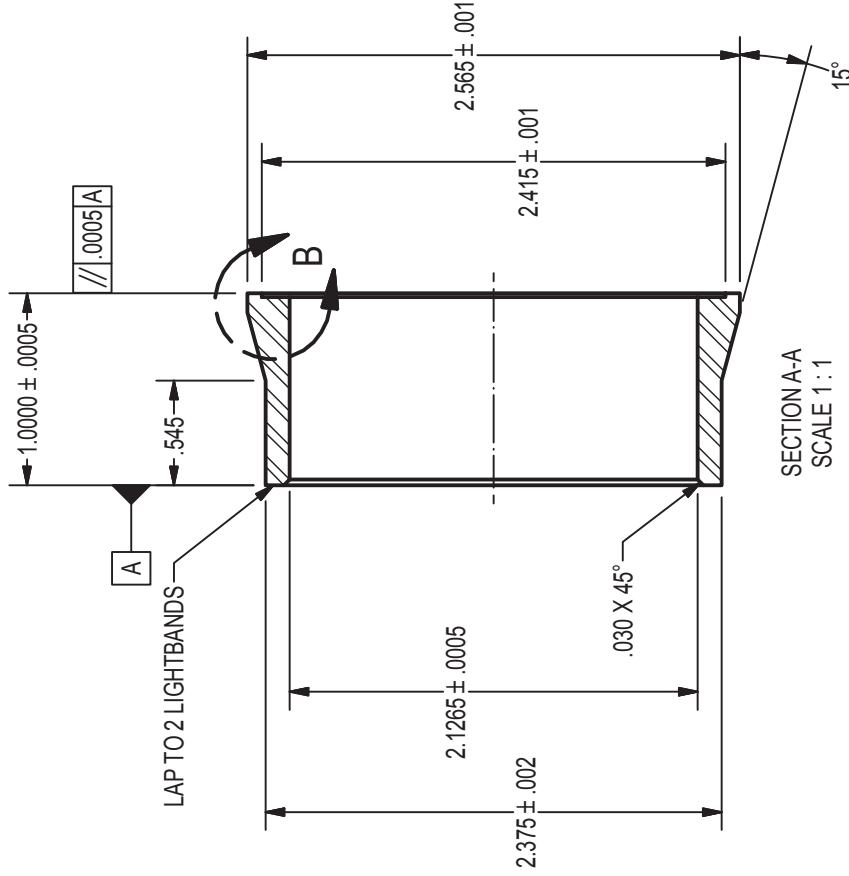
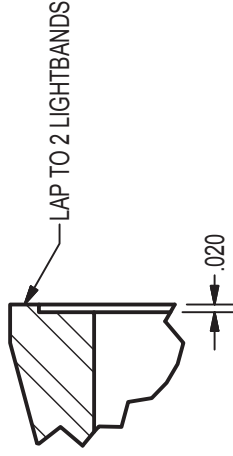
UNLESS SPECIFIED OTHERWISE:		♦ MARK PER MFG STD 1P-5	REV: -	DATE: 16-JUL-2014	BY: LECROOK	CHKD: JODAVIS	APPR:	ECN:	BALLOON NO:	SIMILAR TO:	PART: ROTOR SLEEVE
FEATURE CONTROLS PER ASME Y14.5M-1994		(.) DENOTE REFERENCE ONLY.	REVISION NOTE: RELEASE TO MFG.								SCALE: TO SCALE
APPLIES TO TURNED SURFACES		BREAK / DEBURR SHARP EDGES .003/.020									DRAWN: LECROOK
PARALLEL SURFACES		INTERNAL CORNERS .040 R MAX.									DATE: 16-JUL-2014
COAXIAL DIAMETERS		ANGLES $\pm 2^\circ$ SURFACE ROUGHNESS $\sqrt{125}$									CHKD: JODAVIS
PERPENDICULAR SURFACES		X.XX $\pm .01$ X.XXX $\pm .005$									JOB NO: TTL-1343-035
											DRAWING NO: XC0219979
											REV: -





SECTION A-A
SCALE 2 : 1

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	UNLESS SPECIFIED OTHERWISE: FEATURE CONTROLS PER ASME Y14.5M-1994 APPLIES TO TURNED SURFACES PARALLEL SURFACES \parallel .002 COAXIAL DIAMETERS \varnothing .002 PERPENDICULAR SURFACES \perp .005/INCH	BALLOON NO:				
♦ MARK PER MFG STD 1-R-5 (.) DENOTE REFERENCE ONLY. BREAK / DEBURR SHARP EDGES .003/.020 INTERNAL CORNERS .040 R MAX. ANGLES ± 2° SURFACE ROUGHNESS $\sqrt{125}$ X.XX = ± .01 X.XXX = ± .005		SIMILAR TO:				
		SCALE: TO SCALE				
		DRAWN: LECROOK				
		DATE: 16-JUL-2014				
		CHKD: JODAVIS				
		JOB REF: TTL-1343-035				
		PART: SHAFT INSERT				
		SHEET: 1 OF 1				
		DRAWING NO: XC0219980				
		REV: -				



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DIMENSIONS IN INCHES

INV MAR 10 A/A4

THIRD ANGLE

UNLESS SPECIFIED OTHERWISE:
FEATURE CONTROLS PER ASME Y14.5M-1994
APPLIES TO TURNED SURFACES
PARALLEL SURFACES \parallel .002
COAXIAL DIAMETERS \varnothing .002
PERPENDICULAR SURFACES \perp .005/INCH

REV: A DATE: 18-AUG-2014 BY: LECROOK
REVISION NOTE: ADDED .030 X 45 DEG. CHAMFER.

CHKD: LECROOK

ECN: 14-12972

◆ MARK PER MFG STD 1-R-5
(.) DENOTE REFERENCE ONLY.
BREAK / DEBURR SHARP EDGES .003/.020
INTERNAL CORNERS .040 R MAX.
ANGLES ± 2° SURFACE ROUGHNESS $\sqrt{125}$
X.XX = ± .01 X.XXX = ± .005



BALLOON NO:

SIMILAR TO:

SCALE: TO SCALE

DRAWN: LECROOK

DATE: 16-JUL-2014

CHKD: JODAVIS

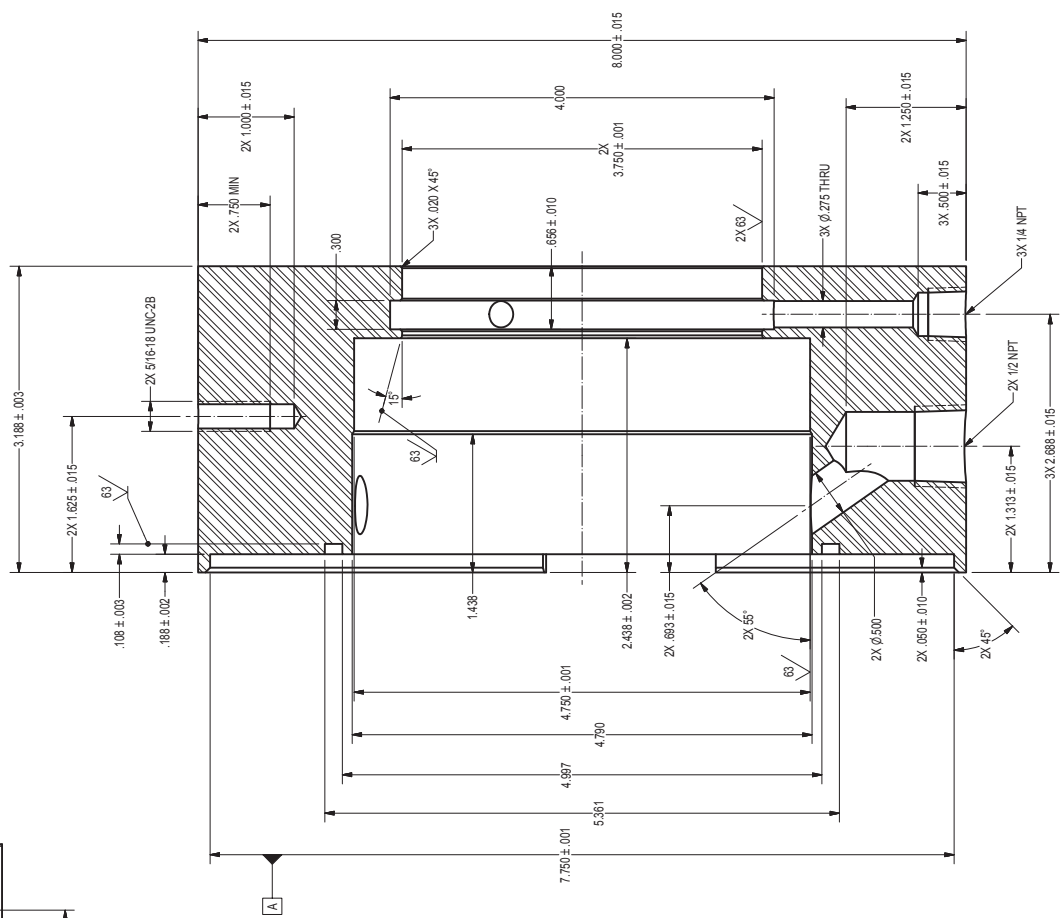
JOB REF: TTL-1343-035

PART: ROTOR LAP RING

SHEET: 1 OF: 1

DRAWING NO: XC0219981


REV: A



SUBPART	PARTCODE	QTY
PIN		1
PART: PRIMARY GLAND		
SALE		
ROCK		
2014	SHEET: 1 OF: 1	
WIS	DRAWING NO:	REV:
1343-035	XC0219982	-

SALE	PART: PRIMARY GLAND
ROCK	
-2014	SHEET: 1 OF: 1
W/S	DRAWING NO: XC0219982
1343-035	REV: -

FLOWERVE®

ECN:	
 THIRD ANGLE	INV MAR 10 C/A2

IN
INCHES

APPR:	RIGHT WHICH IT MAY TION. THIS DRAWING BE MANUFACTURED, VE CORPORATION.
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CHKD: JODAVIS

DEVELOPMENT, INVENTORY OF PROPERTY OF FLOW SUBJECT MATTER AUTHORIZED.

14 BY: LEOR
SE TO MFG.

DATE: 16-JUL-2011
ON NOTE: REL

REV	REV	TH	EM	MA	WIT
6.0031.020		AX.	125/	BHNESS	✓

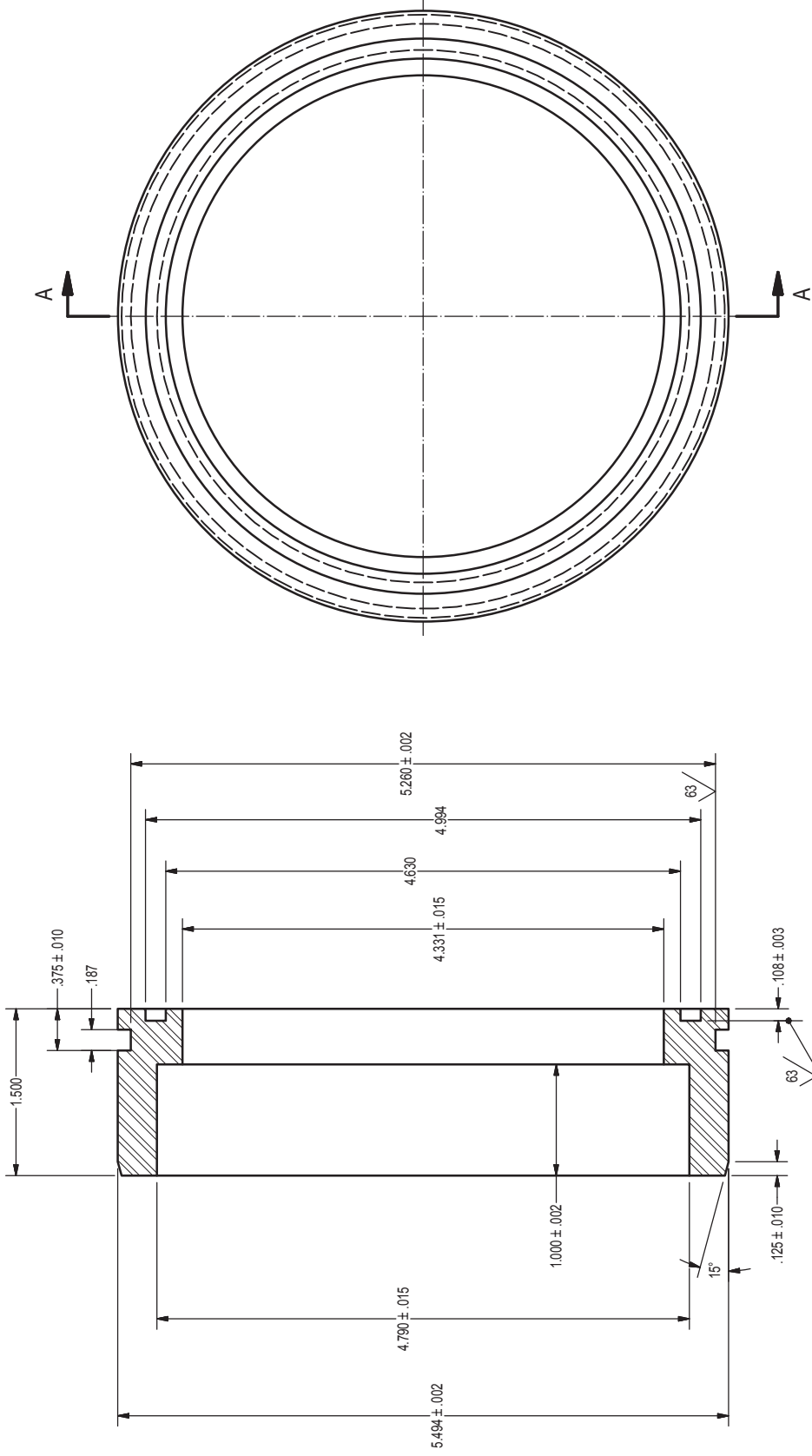
1- R-
 E REFERENCE ON
 EEBURR SHARP E
 CORNERS .040 R
 2" SURFACE RO
 1 XXXX= ± .00

◆ MAP
(..) DEF
BREAK
INTER
ANGLE
X,XX=

FACES	
HOLDERS	
ALL SURFACES	

UNLESS SPECIFIED
FEATURE OR
APPLIES TO
PARALLEL SURFACES
COAXIAL DIA.
PERPENDICULAR

PART: SECONDARY GLAND	
SHEET: 1 OF: 1	
DRAWING NO:	REV:
XC0219983	-



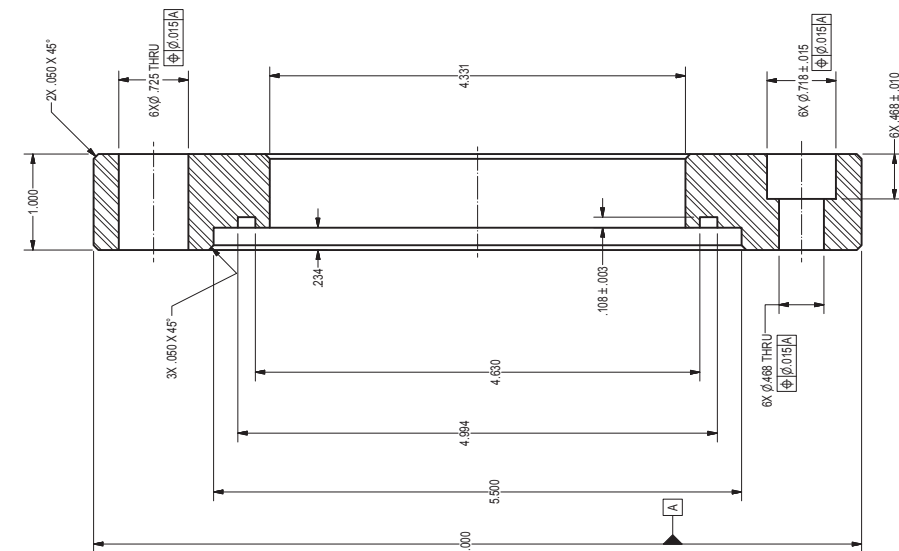
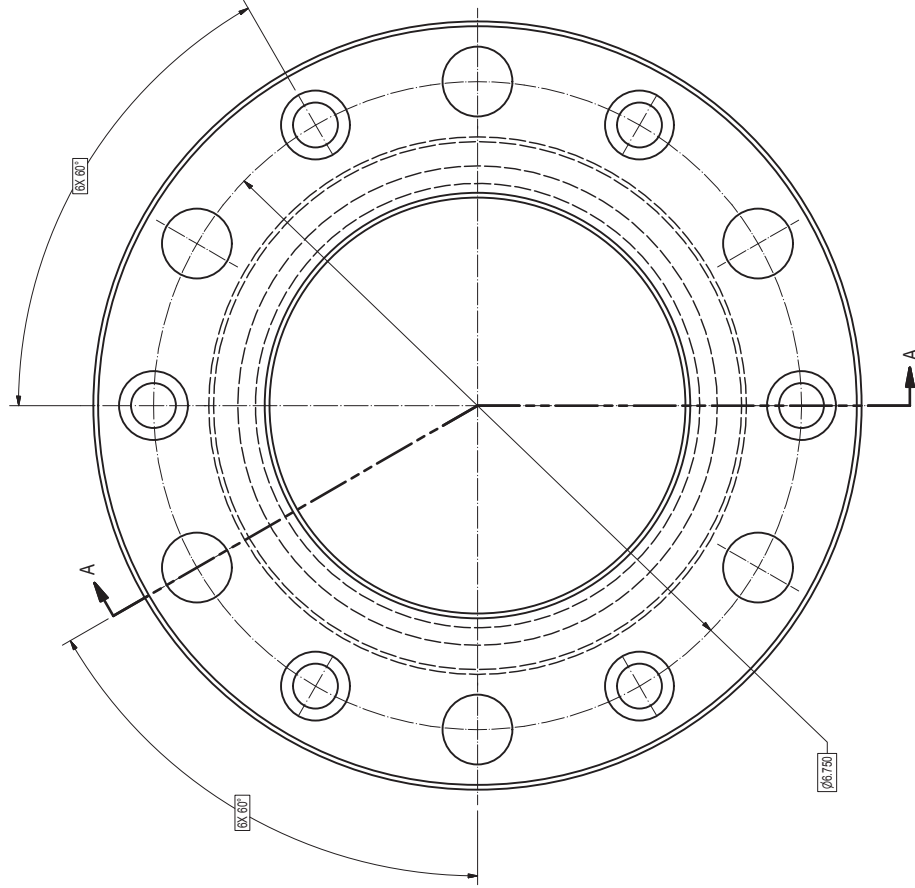
SECTION A-A
SCALE 1 : 1

UNLESS SPECIFIED OTHERWISE: ♦ MARK PER MFG STD. 1P-5 (.) DENOTE REFERENCE ONLY. BREAK / DEBURR SHARP EDGES .003/.020 INTERNAL CORNERS .040 R MAX. ANGLES ± 2° SURFACE ROUGHNESS $\sqrt{125}$ X.XX ± .01 X.XXX ± .005	REV: -	DATE: 16-JUL-2014	BY: LECROOK	CHKD: JODAVIS	APPR:	ECN:	BALLOON NO:	SIMILAR TO:	PART: SIGHT GLASS INSERT
	FEATURE CONTROLS PER ASME Y14.5M-1994							SCALE: TO SCALE	
	APPLIES TO TURNED SURFACES							DRAWN: LECROOK	SHEET: 1 OF: 1
	PARALLEL SURFACES $\sqrt{.002}$							DATE: 16-JUL-2014	DRAWING NO: XC0219984
COAXIAL DIAMETERS $\sqrt{.002}$								CHKD: JODAVIS	REV: -
PERPENDICULAR SURFACES $\sqrt{.005INCH}$								JOB NO: TTL-1343-035	



THIRD ANGLE
DIMENSIONS
IN
INCHES

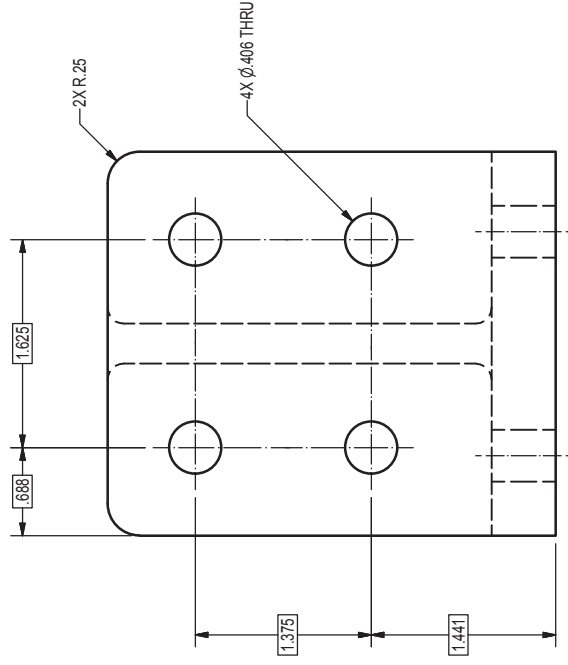
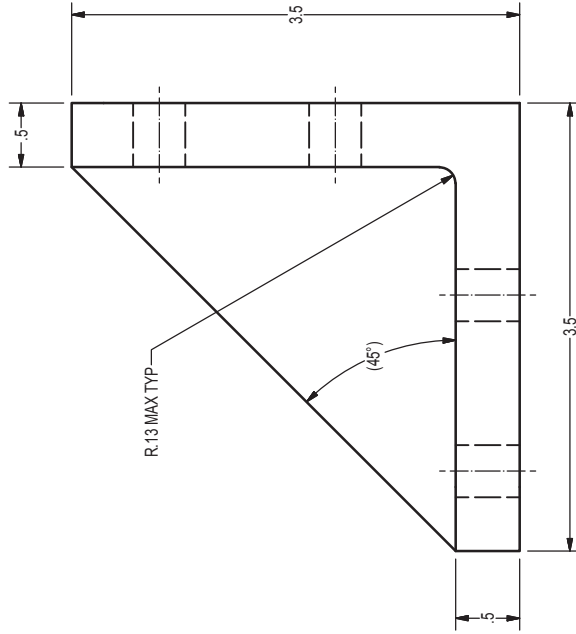
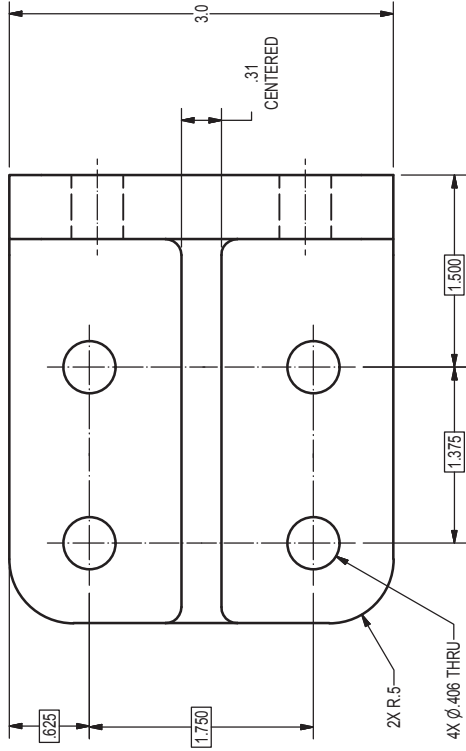
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SECTION A-A
SCALE: 1:1

UNLESS SPECIFIED OTHERWISE:		♦ MARK PER FIG STD 14-3	REV. A	DATE: 18-AUG-2014	BY: LECROOK	CHKD: LECROOK	APPR.	ECN: 14-12972	BALLOON NO.	SIMILAR TO:	PART: SIGHT GLASS COVER	
FEATURE CONTROLS PER ASME Y14.4M-1994		() DENOTE REFERENCE ONLY	REVISION NOTE: REMOVED INSIDE CHAMFER ON 5.500 DIA.		SCALE: TO SCALE		DRAWN: LECROOK		SHEET: 1 OF 1		DRAWING NO. XC0219985	
APPLIES TO TURNED SURFACES		BREAK/DEBURR SHARP EDGES .003 (20)	THIS DRAWING AND ANY DESIGN, DEVELOPMENT, INVENTION OR COPYRIGHT WHICH IT MAY CONTAIN IS THE PROPERTY OF FLOWSERVE CORPORATION. IT IS TO BE USED FOR THE PROJECT AND NO PARTS OR INFORMATION HEREIN MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT WRITTEN PERMISSION FROM AN AUTHORIZED AGENT OF FLOWSERVE CORPORATION.		DATE: 16-JUL-2014		CHKD: JODAVIS		JOB NO: TTL-1343-005		REV. A	
PARALLEL SURFACES		INTERNAL CORNERS .040 R MAX.	INCHES		INCHES		INCHES		INCHES		INCHES	
COAXIAL DIAMETERS		ANGLES ± 2°	SURFACE ROUGHNESS		IN		IN		IN		IN	
PERPENDICULAR SURFACES		XXX ± .01	XXX ± .005		XXX ± .01		XXX ± .005		XXX ± .01		XXX ± .005	



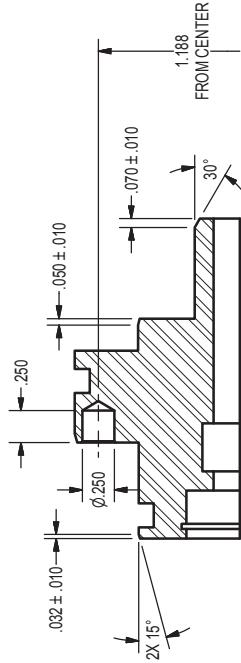
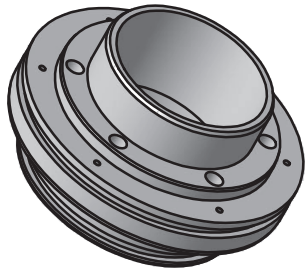


UNLESS SPECIFIED OTHERWISE: ♦ MARK PER MFG STD 1P-5 FEATURE CONTROLS PER ASME Y14.5M-1994 APPLIES TO TURNED SURFACES PARALLEL SURFACES COAXIAL DIAMETERS PERPENDICULAR SURFACES	♦ MARK PER MFG STD 1P-5 (.) DENOTE REFERENCE ONLY. BREAK / DEBURR SHARP EDGES .003/.020 INTERNAL CORNERS .040 R MAX. ANGLES \pm 2° SURFACE ROUGHNESS $\sqrt{125}$ X.XX \pm .01 X.XXX \pm .005	REV: - DATE: 16-JUL-2014 BY: LECROOK REVISION NOTE: RELEASE TO MFG.	CHKD: JODAVIS	APPR:	ECN:	BALLOON NO:	SIMILAR TO: SCALE: TO SCALE DRAWN: LECROOK DATE: 16-JUL-2014 CHKD: JODAVIS JOB NO: TTL-1343-035	PART: GLAND SUPPORT	
								SHEET: 1 OF: 1	DRAWING NO: XC0219986

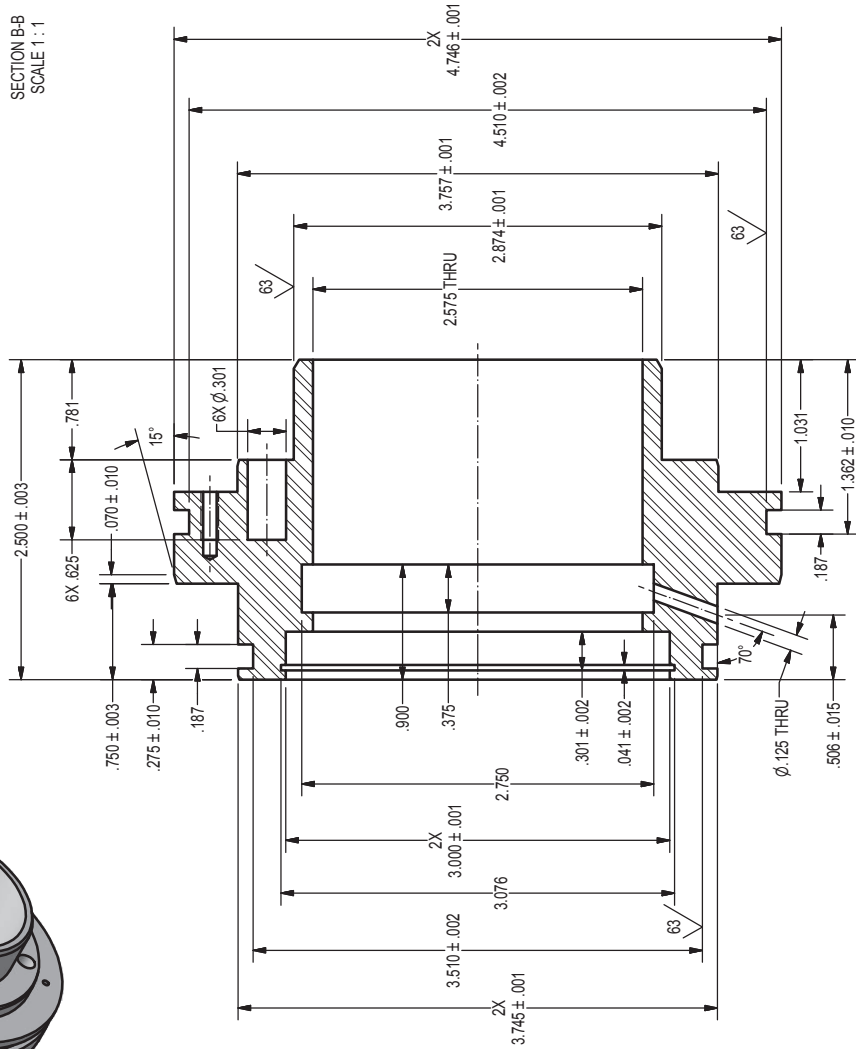


INCHES
DIMENSIONS
IN

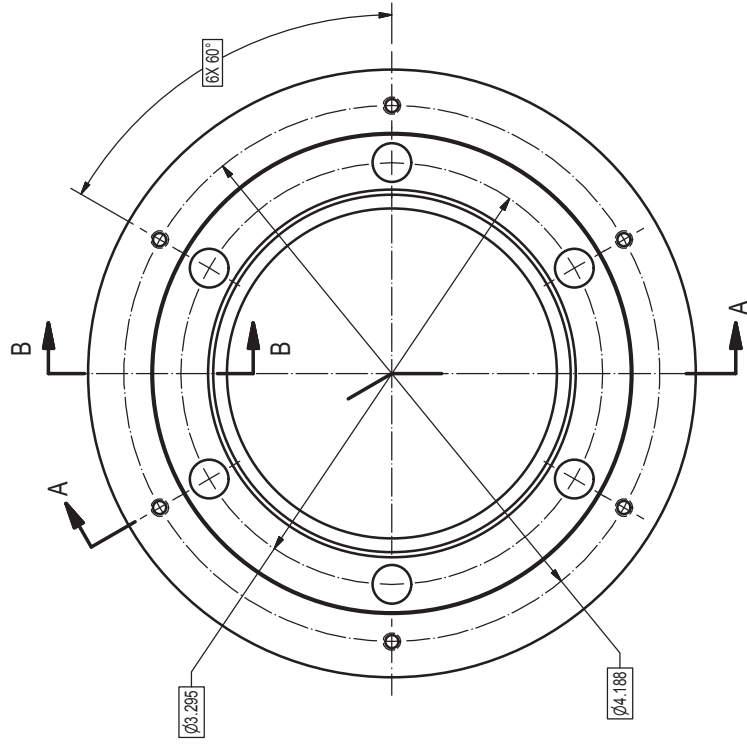
THIS DRAWING AND ANY DESIGN, DEVELOPMENT, INVENTION OR COPYRIGHT WHICH IT MAY EMBODY OR REPRESENT ARE THE PROPERTY OF FLOWSERVE CORPORATION. THIS DRAWING MAY NOT BE REPRODUCED, NOR ANY SUBJECT MATTER SHOWN HEREIN MAY BE MANUFACTURED, WITHOUT WRITTEN PERMISSION FROM AN AUTHORIZED AGENT OF FLOWSERVE CORPORATION.






SECTION B-B
SCALE 1:1







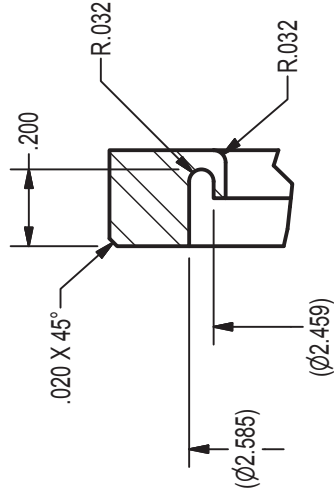
SECTION A-A
SCALE 1:1



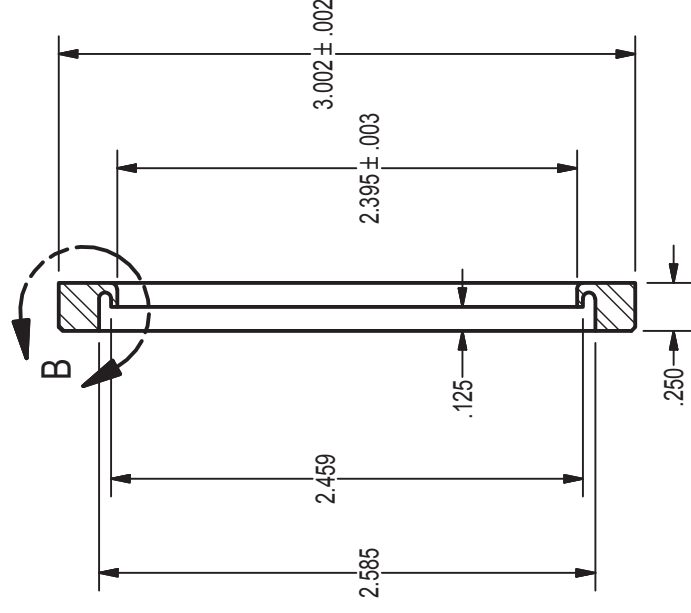
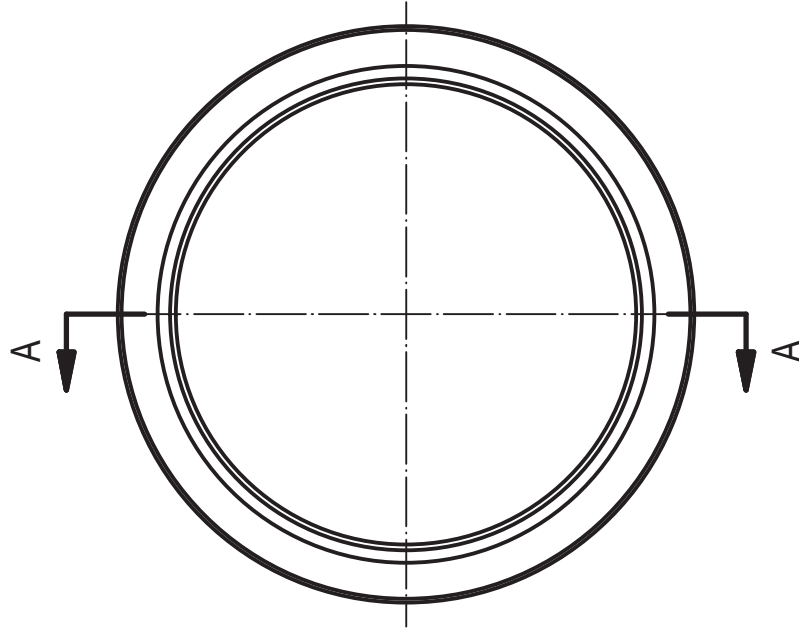
◆ MARK PER MFG STD 14-5 FEATURE CONTROLS PER ASME Y14.5M-1994 (.) DENOTE REFERENCE ONLY. BREAK / DEBURR SHARP EDGES .003/.020 APPLIES TO TURNED SURFACES PARALLEL SURFACES  .002 COAXIAL DIAMETERS  .001 PERPENDICULAR SURFACES  .005INCH X.XX ± .01 X.XXX ± .005										REV: A
UNLESS SPECIFIED OTHERWISE: THIS DRAWING AND ANY DESIGN, DEVELOPMENT, INVENTION OR COPYRIGHT WHICH IT MAY EMBODY OR REPRESENT ARE THE PROPERTY OF FLOWSERVE CORPORATION. THIS DRAWING MAY NOT BE REPRODUCED, NOR ANY SUBJECT MATTER SHOWN HEREIN MAY BE MANUFACTURED, WITHOUT WRITTEN PERMISSION FROM AN AUTHORIZED AGENT OF FLOWSERVE CORPORATION.										REV: A
REVISION NOTE: 250 DIA HOLE IN SECTION B-B WAS A SLOT FEATURE.										REV: A
REV A DATE: 18-AUG-2014 BY: LECROOK CHKD: LECROOK APPR:										REV: A
ECN: 14-12972										REV: A
BALLOON NO:										REV: A
SIMILAR TO:										REV: A
SCALE: TO SCALE										REV: A
DRAWN: LECROOK										REV: A
DATE: 16-JUL-2014										REV: A
CHKD: JODAVIS										REV: A
JOB NO: TTL-1343-035										REV: A
DRAWING NO: XC0219987										REV: A
SHEET: 1 OF 1										REV: A
PART: BALANCE INSERT										REV: A



♦ MARK PER MFG STD 14-5 (.) DENOTE REFERENCE ONLY. BREAK / DEBURR SHARP EDGES .003/.020 APPLIES TO TURNED SURFACES		REV: - DATE: 29-JUL-2014 BY: LECROOK REVISION NOTE: RELEASE TO MFG.		BALLOON NO: 15		SIMILAR TO:		PART: ROTATING FACE	
PARALLEL SURFACES  .002 COAXIAL DIAMETERS  .001 PERPENDICULAR SURFACES  .005INCH		CHKD: JODAVIS		APPR:		ECN:		DRAWN: LECROOK	
INTERNAL CORNERS .040 R MAX ANGLES ± 2° SURFACE ROUGHNESS ✓ X.XXX ± .01 .01/.005INCH		THIS DRAWING AND ANY DESIGN, DEVELOPMENT, INVENTION OR COPYRIGHT WHICH IT MAY EMBODY OR REPRESENT ARE THE PROPERTY OF FLOWSERVE CORPORATION. THIS DRAWING MAY NOT BE REPRODUCED, NOR ANY SUBJECT MATTER SHOWN HEREIN MAY BE MANUFACTURED, WITHOUT WRITTEN PERMISSION FROM AN AUTHORIZED AGENT OF FLOWSERVE CORPORATION.		DIMENSIONS IN INCHES		INV: MAR 10  THIRD ANGLE		DATE: 29-JUL-2014 CHKD: JODAVIS JOB NO: TTL-1343-033	
				FLOWSERVE		DRAWING NO: XC0221404		SHEET: 1 OF: 1 REV: -	



DETAIL B
SCALE 2 : 1



SECTION A-A
SCALE 1 : 1

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DIMENSIONS
IN
INCHES



INV
MAR 10
A/A4

REV: -
REVISION NOTE: RELEASE TO MFG.

DATE: 29-JUL-2014 BY: LECROOK
CHKD: JODAVIS

APPR:

ECN:

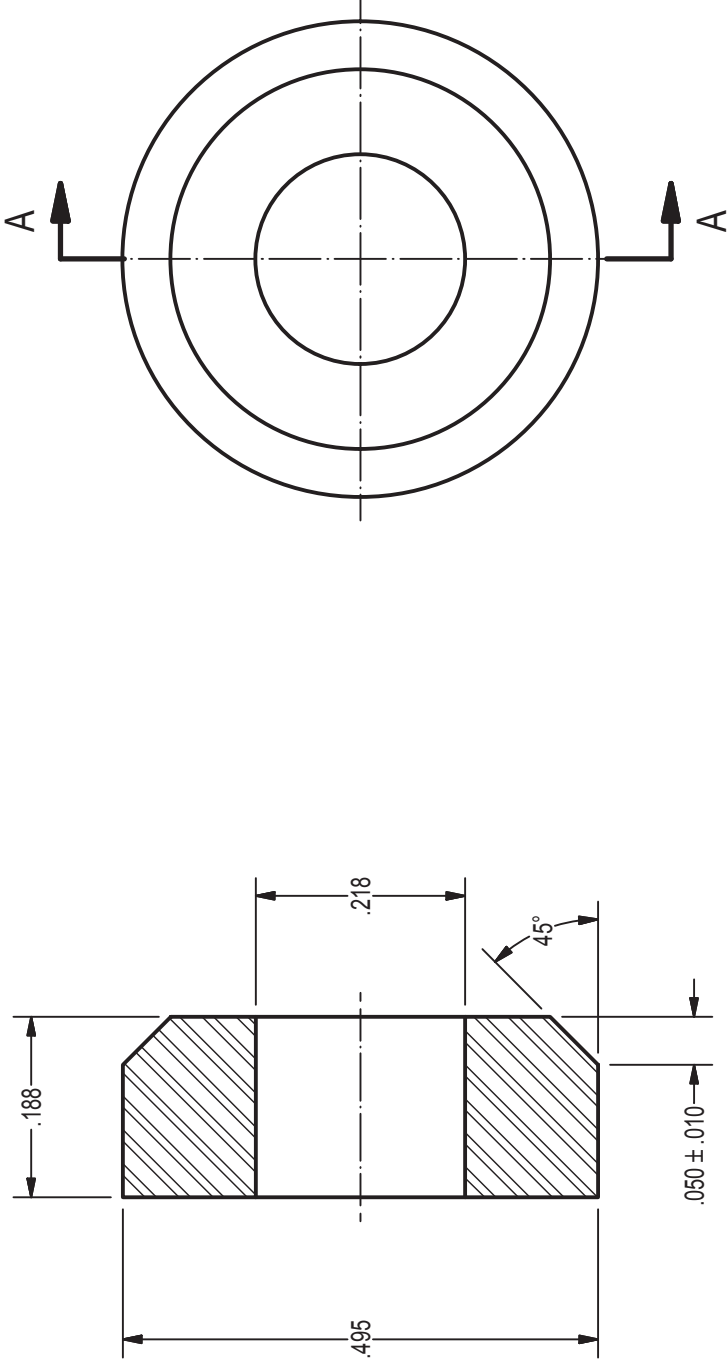
UNLESS SPECIFIED OTHERWISE:
FEATURE CONTROLS PER ASME Y14.5M-1994
APPLIES TO TURNED SURFACES
PARALLEL SURFACES \parallel .002
COAXIAL DIAMETERS Ø .002
PERPENDICULAR SURFACES \perp .005/INCH
X.XX = ± .01 X.XXX = ± .005

◆ MARK PER MFG STD 1-R-5
(.) DENOTE REFERENCE ONLY.
BREAK / DEBURR SHARP EDGES .003/.020
INTERNAL CORNERS .040 R MAX.
ANGLES ± 2° SURFACE ROUGHNESS $\sqrt{125}$





SIMILAR TO:
SCALE: TO SCALE
DRAWN: LECROOK
DATE: 29-JUL-2014
CHKD: JODAVIS
JOB REF: TTL-1343-035

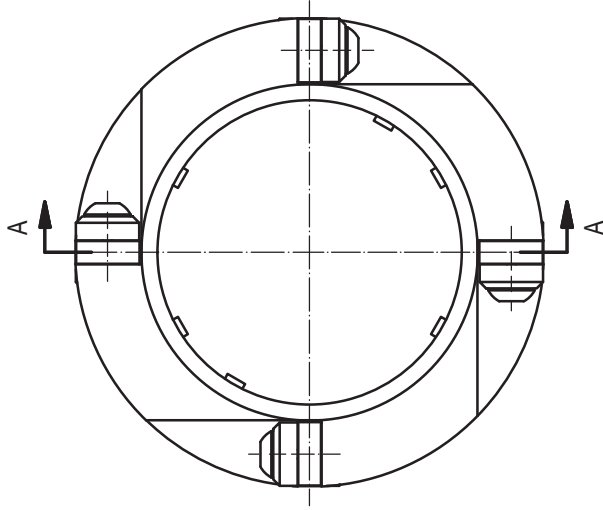
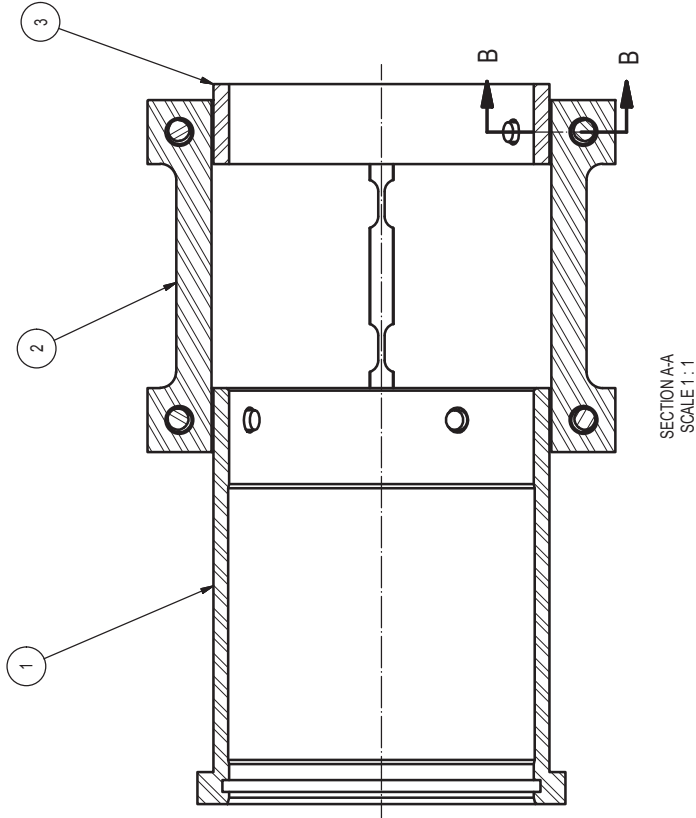
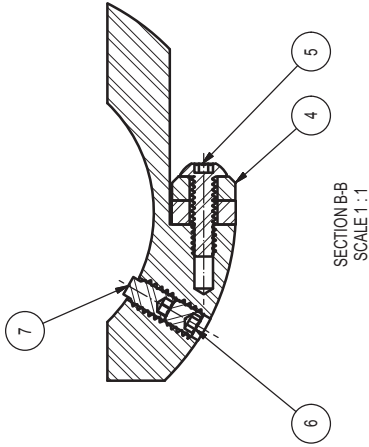
PART: STATOR INSERT BUSH
SHEET: 1 OF: 1
DRAWING NO: XC0221405
REV: -



SECTION A-A
SCALE 5 : 1

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	UNLESS SPECIFIED OTHERWISE: FEATURE CONTROLS PER ASME Y14.5M-1994 APPLIES TO TURNED SURFACES PARALLEL SURFACES \parallel .002 COAXIAL DIAMETERS \varnothing .002 PERPENDICULAR SURFACES \perp .005/INCH			BALLOON NO:				PART: STRAIN BAR SUPPORT
	◆ MARK PER MFG STD 1-R-5 (.) DENOTE REFERENCE ONLY. BREAK / DEBURR SHARP EDGES .003/.020 INTERNAL CORNERS .040 R MAX. ANGLES $\pm 2^\circ$ SURFACE ROUGHNESS $\sqrt{125}$ X.XX= $\pm .01$ X.XXX= $\pm .005$							
				SIMILAR TO:				
				SCALE: TO SCALE				
				DRAWN: LECROOK				SHEET: 1 OF: 1
				DATE: 29-JUL-2014				DRAWING NO:
				CHKD: JODAVIS				XC0221447
				JOB REF: TTL-1343-035				REV: -

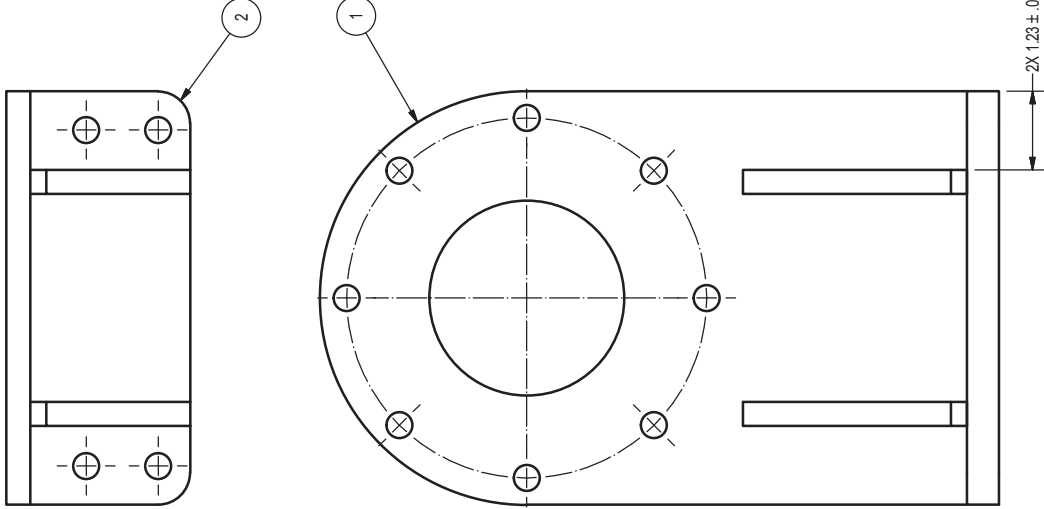
NO.	PART CODE	QTY	DESCRIPTION	MATERIAL
1	XC0219970WG63	1	COUPLING HUB DRIVE SHAFT	7075-T6 ALUM
2	XC0219971WA65	4	STRAIN BAR	GRADE 5 TI
3	XC0219972WG63	1	COUPLING HUB DRIVEN SHAFT	7075-T6 ALUM
4	XC0221447FN	8	STRAINBAR SUPPORT	6061-T6 ALUM
5	91255A244	4	10-24 X 5/8 BHD CAP SCR- MCMASTER	STEEL
6	92158A417	6	1/4-20 X 1/4 SOC SET SCR- MCMASTER	SS
7	92845A126	6	1/4-20 X 5/8 DG PT SET SCR- MCMASTER	SS



REV: A	DATE: 20-AUG-2014 BY: LECROOK	CHKD: LECROOK	APPR:	EON: 14-12972	DIMENSIONS ARE REFERENCES UNLESS SPECIFIED OTHERWISE	SCALE: TO SCALE	FORM DWG:
REVISION NOTE: BOM: ITEM 4 WAS QTY 4, AND PIN WAS XC0219973.					DIMENSIONS IN INCHES	DRAWN: LECROOK	SHEET: 1 OF: 1
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					MAR 10	CHKD: JODAVIS	XD0219672
					B/A3	JOB NO: TTL-1343-035	REV: A

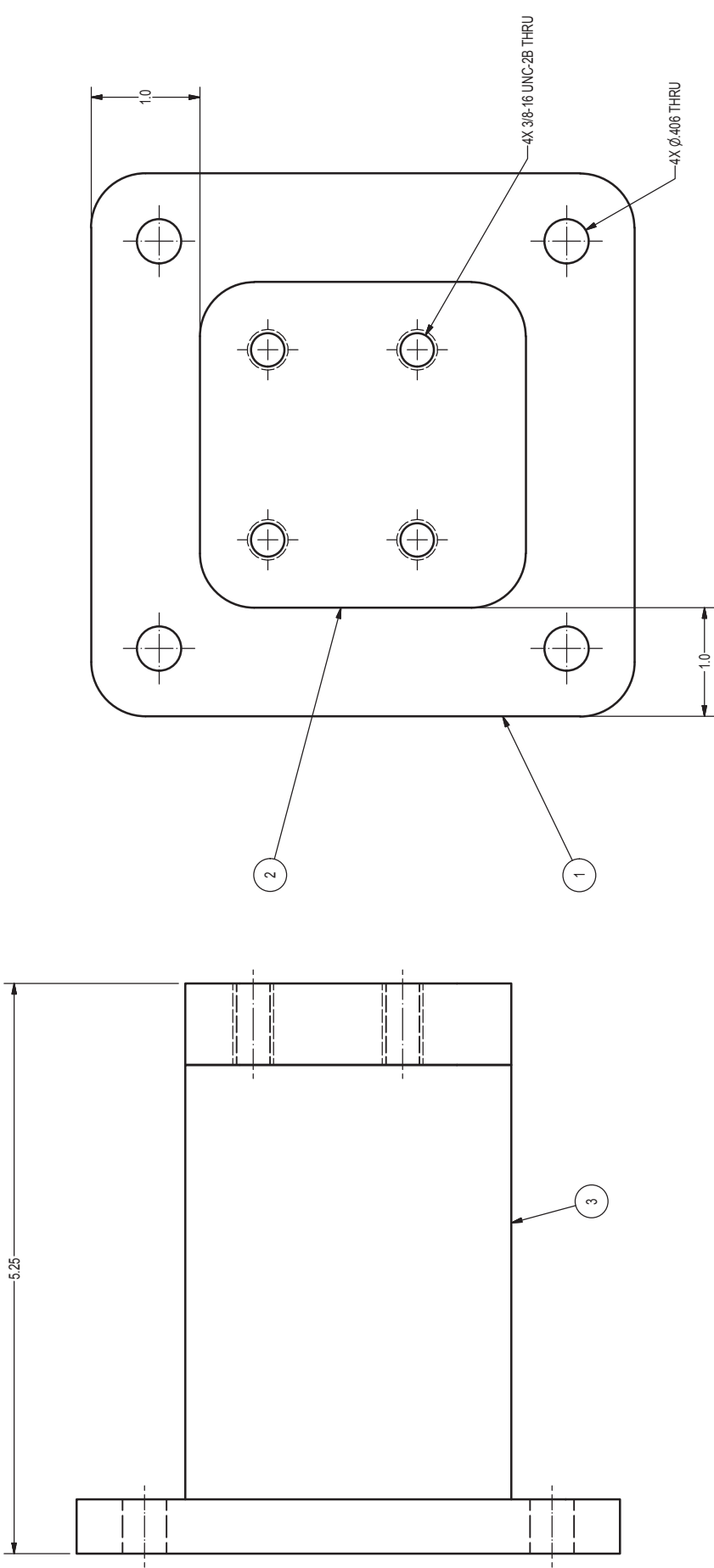


NO.	PARTCODE	QTY	DESCRIPTION	MATERIAL
1	XC0219964EH	1	HSG PLATE	CARBON STEEL
2	XC0219965EH	1	BRG MT BOTTOM	CARBON STEEL
3	XC0219966EH	2	GUSSET	CARBON STEEL



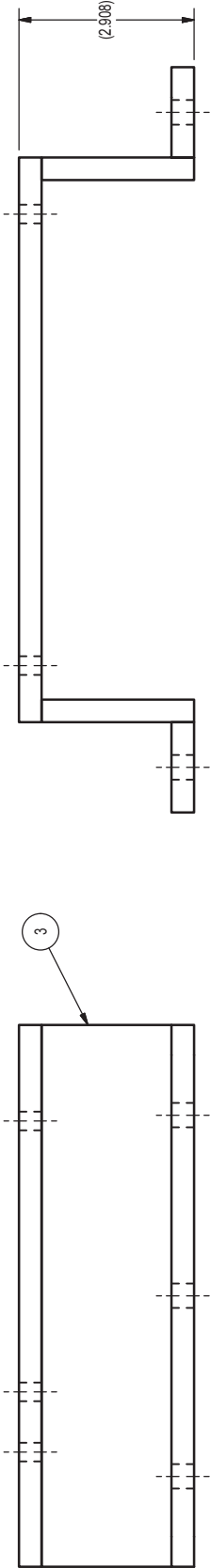
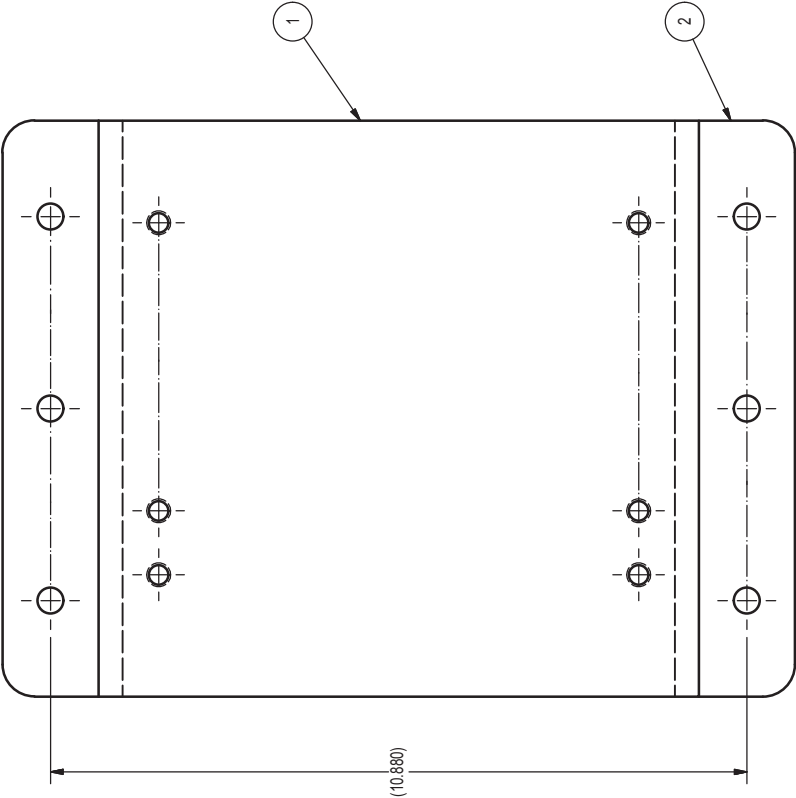
REV: -	DATE: 14-JUL-2014	BY: LECROOK	CHKD: JODAVIS	APPR:	EON:	DIMENSIONS ARE REFERENCES UNLESS SPECIFIED OTHERWISE		FLOWSERVE		SCALE: TO SCALE	FORM DWG:
REVISION NOTE: RELEASE TO MFG.						DIMENSIONS IN INCHES		INV MAR 10		DRAWN: LECROOK	SHEET: 1 OF: 1
THIS DRAWING AND ANY DESIGN DEVELOPMENT, INVENTION OR COPYRIGHT WHICH IT MAY EMBODY OR REPRESENT ARE THE PROPERTY OF FLOWSERVE CORPORATION. THIS DRAWING MAY NOT BE REPRODUCED, NOR ANY SUBJECT MATTER SHOWN HEREIN MAY BE MANUFACTURED WITHOUT WRITTEN PERMISSION FROM AN AUTHORIZED AGENT OF FLOWSERVE CORPORATION.						THIRD ANGLE		CHKD: JODAVIS		DRAWING NO:	REV:
								JOB NO: TTL-1343-035		XD0219673	-

NO.	PARTCODE	QTY	DESCRIPTION	MATERIAL
1	XC0219967	1	LOWER PLATE	CARBON STEEL
2	XC0219968	1	TOP PLATE	CARBON STEEL
3	XC0219969	1	TUBING-1	CARBON STEEL



REV: -	DATE: 14-JUL-2014	BY: LECROOK	CHKD: JODAVIS	APPR:	EON:	DIMENSIONS ARE REFERENCES UNLESS SPECIFIED OTHERWISE			FLOWSERVE			SCALE: TO SCALE	FORM DWG:
REVISION NOTE: RELEASE TO MFG.						DIMENSIONS IN INCHES	IN	THIRD ANGLE	DRAWN: LECROOK	SHEET: 1	OF: 1	DATE: 14-JUL-2014	DRAWING NO:
THIS DRAWING AND ANY DESIGN DEVELOPMENT, INVENTION OR COPYRIGHT WHICH IT MAY EMBODY OR REPRESENT ARE THE PROPERTY OF FLOWSERVE CORPORATION. THIS DRAWING MAY NOT BE REPRODUCED, NOR ANY SUBJECT MATTER SHOWN HEREIN MAY BE MANUFACTURED WITHOUT WRITTEN PERMISSION FROM AN AUTHORIZED AGENT OF FLOWSERVE CORPORATION.						IN	IN	IN	CHKD: JODAVIS	JOB NO: TTL-1343-035		REV:	
													XD0219674
													-

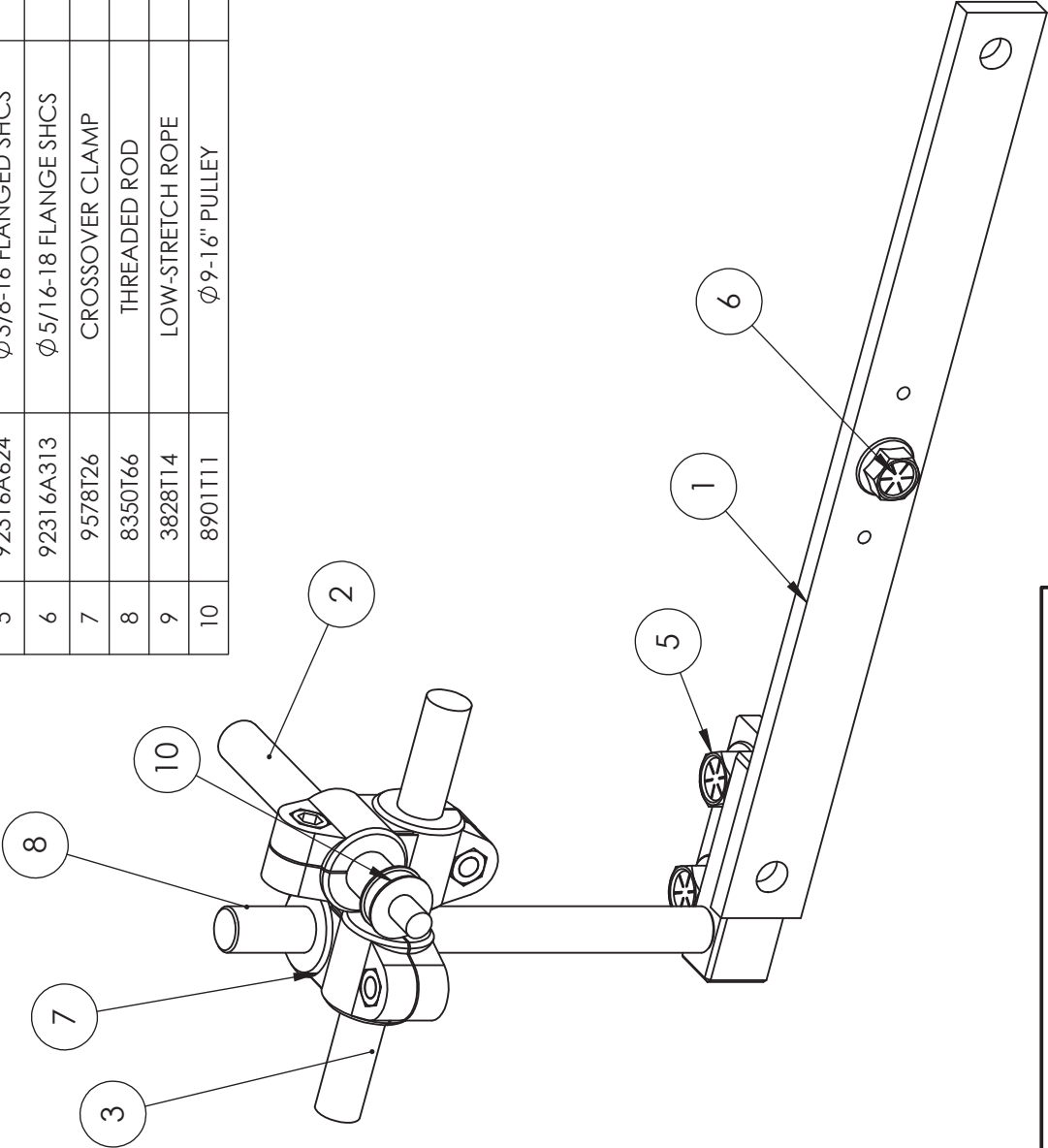
NO.	PARTCODE	QTY	DESCRIPTION	MATERIAL
1	XC0219960EH	1	MM_TOP PLATE	CARBON STEEL
2	XC0219962EH	2	MM_BOTTOM PLATE	CARBON STEEL
3	XC0219961EH	2	MM_SIDE PLATE	CARBON STEEL



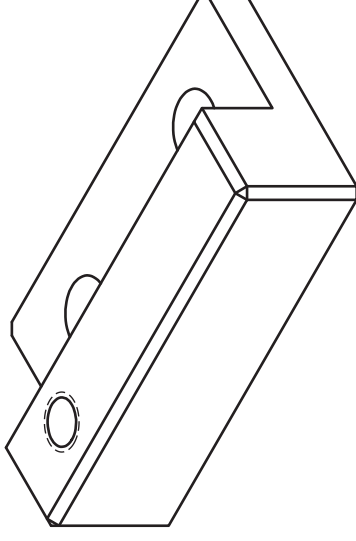
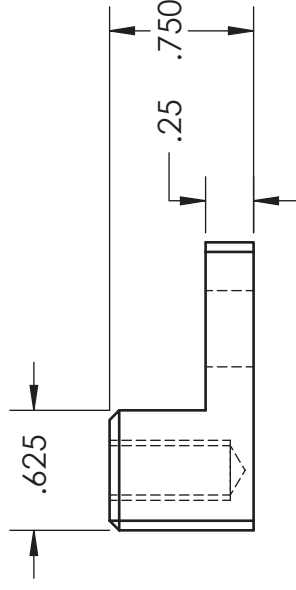
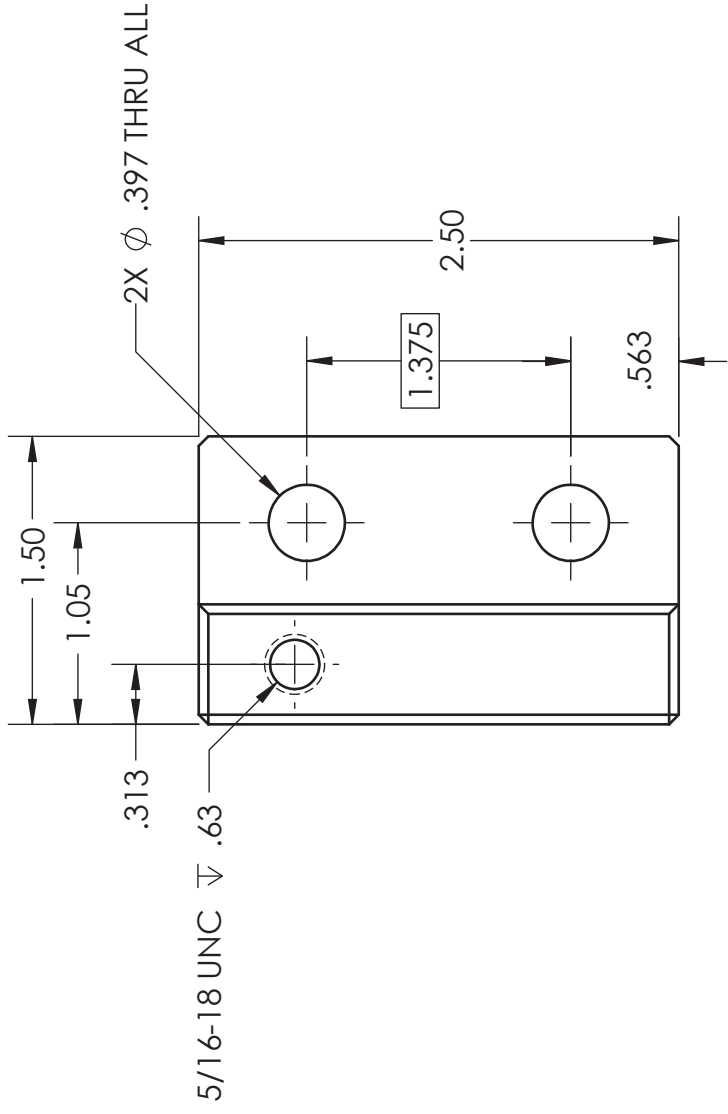
REV: -	DATE: 16-JUL-2014	BY: LECROOK	CHKD: JODAVIS	APPR:	EON:	DIMENSIONS ARE REFERENCES UNLESS SPECIFIED OTHERWISE			FORM DWG:		
REVISION NOTE: RELEASE TO MFG.						DIMENSIONS IN INCHES			SCALE: TO SCALE		
THIS DRAWING AND ANY DESIGN, DEVELOPMENT, INVENTION OR COPYRIGHT WHICH IT MAY EMBODY OR REPRESENT ARE THE PROPERTY OF FLOWSERVE CORPORATION. THIS DRAWING MAY NOT BE REPRODUCED, NOR ANY SUBJECT MATTER SHOWN HEREIN MAY BE MANUFACTURED WITHOUT WRITTEN PERMISSION FROM AN AUTHORIZED AGENT OF FLOWSERVE CORPORATION.						THIRD ANGLE			DRAWN: LECROOK		
						INCHES			DATE: 16-JUL-2014		
						INCHES			CHKD: JODAVIS		
						INCHES			JOB NO: TTL-1343-035		
						INCHES			DRAWING NO: XD0219675		
						INCHES			REV: -		

Appendix B2:
Testing Components,
Pulley System Drawings

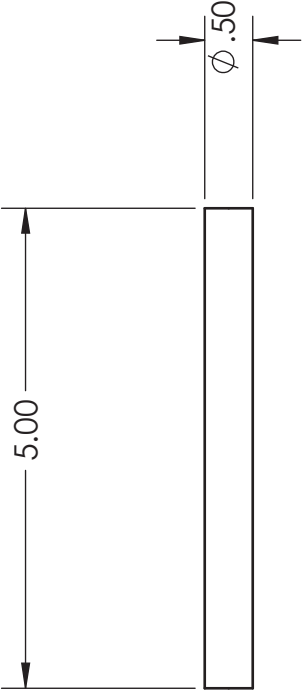
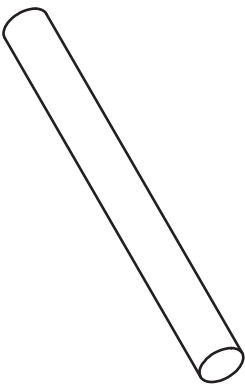
ITEM NO.	PART NO.	DESCRIPTION	MATERIAL	VENDOR	QTY.
1	PS004	WEIGHT BAR	CARBON STEEL	~	1
2	PS003	INTERMEDIATE ROD	6061 ALUM	~	1
3	PS002	MOUNT ROD	6061 ALUM	~	1
4	PS001	BRACKET	CARBON STEEL	~	1
5	92316A624	Ø 3/8-16 FLANGED SHCS	18-8 SS	MCMASTER CARR	2
6	92316A313	Ø 5/16-18 FLANGE SHCS	18-8 SS	MCMASTER CARR	1
7	9578T26	CROSSOVER CLAMP	~	MCMASTER CARR	2
8	8350T66	THREADED ROD	6061 ALUM	MCMASTER CARR	1
9	3828T14	LOW-STRETCH ROPE	POLYESTER	MCMASTER CARR	1
10	8901T11	Ø 9-16" PULLEY	ACETAL	MCMASTER CARR	1



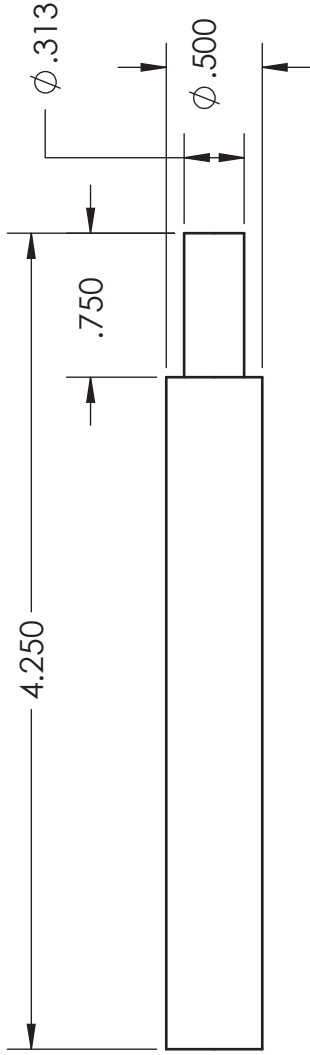
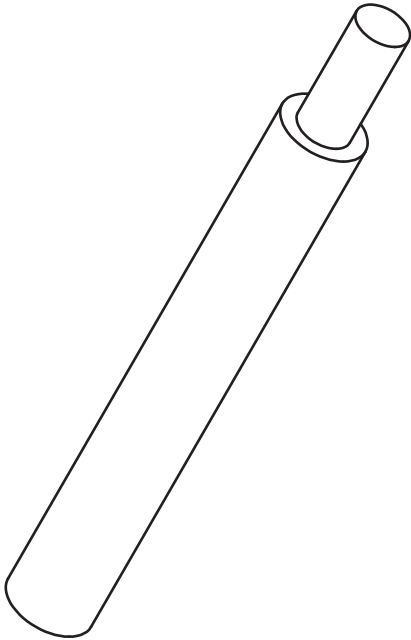
Mechanical Seal Torque Test System						
Cal Poly Mechanical Engineering ME429 - Spring 2014	REV/VER B	DOC. NO.		Title: PULLEY SYSTEM		Dwn. By: TAYLOR CATLIN
		Nxt Asb: PS001		Date:	Scale:	
						Chkd. By: B. ROJANACHAICHANIN



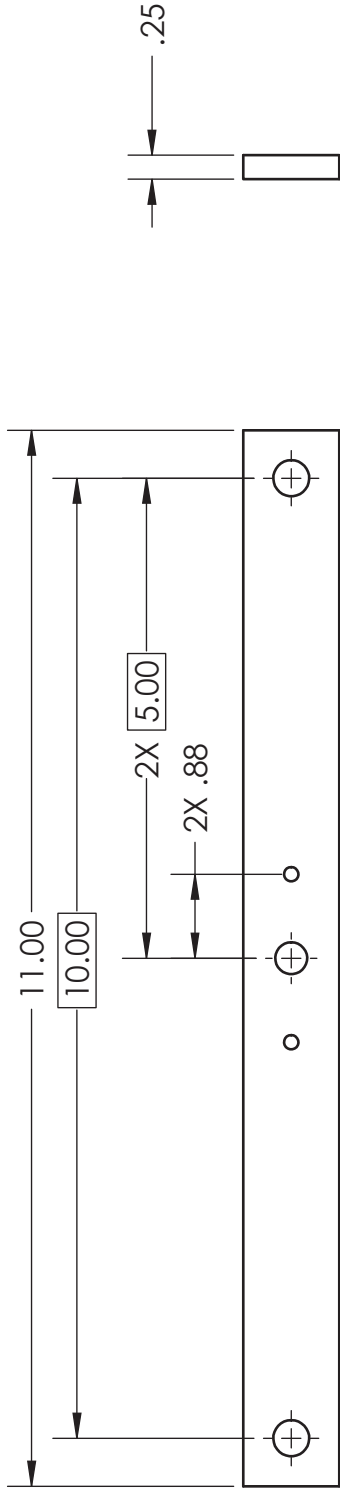
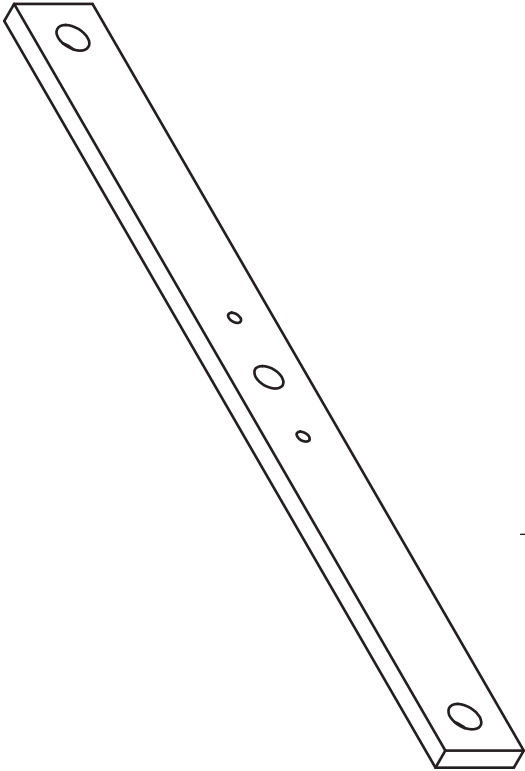
Mechanical Seal Torque Test System			Title: BRACKET		Dwn. By: T. CATLIN	
Cal Poly Mechanical Engineering ME429 - Spring 2014		REV/VER B	DOC. NO. PS001	Date:		Chkd. By: B. ROJANACHAICHANIN
		Nxt Asb: PS002			Scale: 1:1	



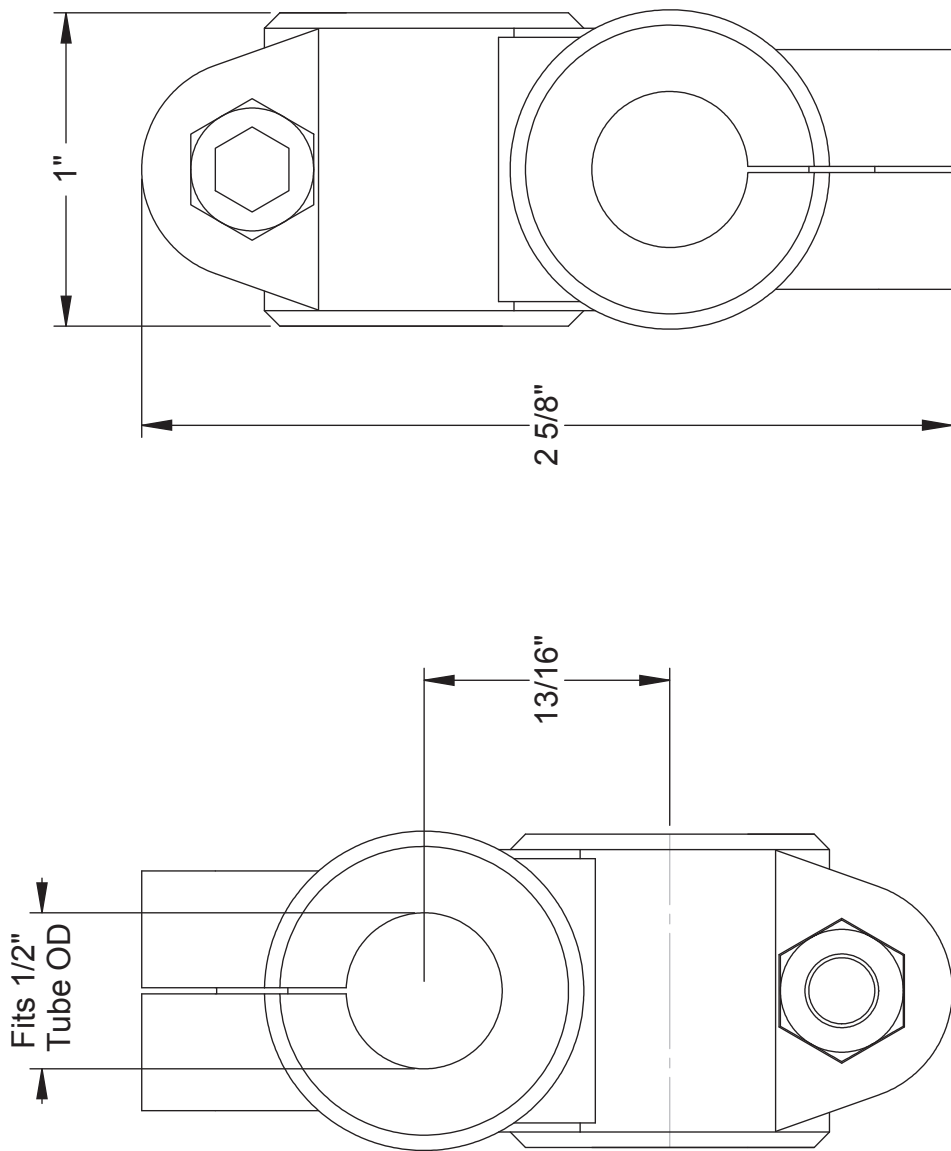
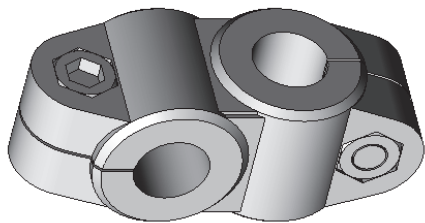
Mechanical Seal Torque Test System					
Cal Poly Mechanical Engineering ME429 - Spring 2014	REV/VER B	DOC. NO. PS002	Title: MOUNTING ROD		Drwn. By: T. CATLIN
		Nxt Asb: PS003	Date:	Scale: 1:1	
		Chkd. By: B. ROJANACHAICHANIN			



Mechanical Seal Torque Test System		Title: INTERMEDIATE ROD		Dwn. By: T. CATLIN	
Cal Poly Mechanical Engineering ME429 - Spring 2014	REV/VER	DOC. NO. PS003	Date:	Scale: 1:1	Chkd. By: B. ROJANACHAICHANIN
		Nxt Asb: PS004			



Mechanical Seal Torque Test System				
Cal Poly Mechanical Engineering ME429 - Spring 2014	REV/VER B	DOC. NO. PS004	Title: WEIGHT BAR	Dwn. By: T. CATLIN
		Nxt Asb:	Date:	Chkd. By: B. ROJANACHAICHANIN
			Scale:	



McMASTER-CARR 

PART
NUMBER

9578T26

<http://www.mcmaster.com>

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Information in this drawing is provided for reference only.

Aluminum
Crossover

Appendix C:
Cost Report



	Non-Salary	Salary	Total
Approved	\$27,500.00	\$ 12,500.00	\$ 40,000.00
Total Actuals	\$27,500.00	\$ 31,139.89	\$ 73,500.47
Total Forecast	\$42,360.58	-	\$ -
Forecast Error %	100%	100%	200%
Month Actuals	\$ 6,000.76	-	\$ 6,000.76
Month Forecast	\$ -	\$ -	\$ -
Sep	\$ -	\$ -	\$ -

Vendor / Role	Part # / Competency	Description	Cost Type	Actual or Forecast	Invoice Month	QTY	Price Each	Total
Cal Poly	Invoice #110	Sponsorship Fee	Non-Salary	Actual	Mar	1	\$ 3,000.00	\$ 3,000.00
Cal Poly	N/A	Salary design reviews	Salary	Actual	Apr	3	\$ 86.62	\$ 259.86
Cal Poly	Invoice #111	Travel expenses	Non-Salary	Actual	Jun	1	\$ 850.00	\$ 850.00
ATI	PO985622	Telemetry System	Non-Salary	Actual	July	1	\$ 9,286.25	\$ 9,286.25
ATI	PO985622	Calibration	Non-Salary	Actual	Oct	1	\$ 3,420.00	\$ 3,420.00
ATI	PO985622	Fixturing	Non-Salary	Actual	Oct	1	\$ 950.00	\$ 950.00
Jun Hours	N/A	June Hours	Salary	Actual	Jun	8	\$ 86.62	\$ 692.96
Glass Dynamics	135mmX25mm	Sight Glass	Non-Salary	Actual	Aug	1	\$ 314.67	\$ 314.67
Pacific Electric	PO 985629	Waterjet parts	Non-Salary	Actual	Aug	1	\$ 604.00	\$ 604.00
Flowsolve	PO 985632	Shaft - Rancho QRC	Non-Salary	Actual	Aug	1	\$ 3,980.00	\$ 3,980.00
digitalsalesaz.com	leakage detection	http://www.digitalsalesaz.com/McWeighBalance-m01-Digital-Scale	Non-Salary	Actual	Sep	1	\$ 201.99	\$ 201.99
us plastic	leakage detection	https://www.usplastic.com/catalog/Item.aspx?itemid=74905&catid=894	Non-Salary	Actual	Sep	1	\$ 8.98	\$ 8.98
granger	leakage detection	https://www.granger.com/product/PARKER-Hose-Barb-3HCC6	Non-Salary	Actual	Sep	3	\$ 46.92	\$ 140.76
flexible PVC	leakage detection	http://www.theblipnet.net/Clear_Vinyl_Tubing_6/clearvinyltubing.htm	Non-Salary	Actual	Sep	1	\$ 12.98	\$ 12.98
us solid	leakage detection	https://www.usolid.com/1-valve/1-4-electric-solenoid-valve-12-volt-air-water.html	Non-Salary	Actual	Sep	1	\$ 30.00	\$ 30.00
office depot	leakage detection	https://www.officedepot.com/a/products/867516/Star-Technic-US8-to-MS232-D8908-25-Serial/	Non-Salary	Actual	Sep	1	\$ 17.99	\$ 17.99
us plastic	leakage detection	https://www.usplastic.com/catalog/Item.aspx?itemid=74905&catid=894	Non-Salary	Actual	Sep	2	\$ 0.56	\$ 1.12
us plastic	leakage detection	https://www.usplastic.com/catalog/Item.aspx?itemid=74905&catid=894	Non-Salary	Actual	Sep	1	\$ 36.08	\$ 36.08
newark	leakage detection	https://www.newark.com/1-valve/1-4-electric-solenoid-valve-12-volt-air-water.html	Non-Salary	Actual	Sep	1	\$ 36.08	\$ 36.08
toofanatic	leakage detection	https://www.toofanatic.com/product/1-valve/1-4-electric-solenoid-valve-12-volt-air-water.html	Non-Salary	Actual	Sep	1	\$ 1.89	\$ 1.89
Jul Hours	N/A	Jul Hours from Planview	Salary	Actual	July	99	\$ 86.62	\$ 8,575.38
Aug Hours	N/A	Aug Hours from Planview	Salary	Actual	Aug	75	\$ 86.62	\$ 6,496.50
Sept Actuals	N/A	XC0219980DB	Non-Salary	Actual	Sep	1	\$ 332.75	\$ 332.75
Sept Actuals	N/A	XC0219984DB	Non-Salary	Actual	Sep	1	\$ 517.52	\$ 517.52
Sept Actuals	N/A	XC0221405HD	Non-Salary	Actual	Sep	1	\$ 363.88	\$ 363.88
Sept Actuals	N/A	XC00219971WA65	Non-Salary	Actual	Sep	1	\$ 1,296.09	\$ 1,296.09
Sept Actuals	N/A	XC0219988DB	Non-Salary	Actual	Sep	1	\$ 332.35	\$ 332.35
Sept Actuals	N/A	BRITHINEE ELEC EM3219T	Non-Salary	Actual	Sep	1	\$ 770.00	\$ 770.00
Sept Actuals	N/A	COORSTEK * XC0221404	Non-Salary	Actual	Sep	1	\$ 272.94	\$ 272.94
Sept Actuals	N/A	COORSTEK * XC0221404	Non-Salary	Actual	Sep	1	\$ 1,663.44	\$ 1,663.44
Oct Actuals	N/A	568038GU	Non-Salary	Actual	Oct	1	\$ 0.31	\$ 0.31
Oct Actuals	N/A	568138GU	Non-Salary	Actual	Oct	1	\$ 0.29	\$ 0.29
Oct Actuals	N/A	568233GU	Non-Salary	Actual	Oct	1	\$ 0.57	\$ 0.57
Oct Actuals	N/A	568238GU	Non-Salary	Actual	Oct	1	\$ 0.70	\$ 0.70
Oct Actuals	N/A	568246GU	Non-Salary	Actual	Oct	1	\$ 0.99	\$ 0.99
Oct Actuals	N/A	568248GU	Non-Salary	Actual	Oct	1	\$ 2.05	\$ 2.05
Oct Actuals	N/A	568251GU	Non-Salary	Actual	Oct	1	\$ 1.09	\$ 1.09
Oct Actuals	N/A	668838NL	Non-Salary	Actual	Oct	1	\$ 3.30	\$ 3.30
Oct Actuals	N/A	154787GE	Non-Salary	Actual	Oct	1	\$ 25.95	\$ 25.95
Oct Actuals	N/A	568122GU	Non-Salary	Actual	Oct	1	\$ 0.34	\$ 0.34
Oct Actuals	N/A	568252GU	Non-Salary	Actual	Oct	1	\$ 1.44	\$ 1.44

Oct Actuals		N/A	668848DB		Non-Salary	Actual	Oct	1	\$	4.01	\$	4.01
Oct Actuals		N/A	XC0219973DB		Non-Salary	Actual	Oct	1	\$	1,906.93	\$	1,906.93
Oct Actuals		N/A	XC0219977WA65		Non-Salary	Actual	Oct	1	\$	1,412.67	\$	1,412.67
Oct Actuals		N/A	APPLIED INDUST BARDEN-204		Non-Salary	Actual	Oct	1	\$	184.99	\$	184.99
Oct Actuals		N/A	APPLIED INDUST SKF60032RS		Non-Salary	Actual	Oct	1	\$	130.93	\$	130.93
Oct Actuals		N/A	SMALLEY STEEL SSR-462		Non-Salary	Actual	Oct	1	\$	50.00	\$	50.00
Oct Actuals		N/A	SMALLEY STEEL WHIT-185		Non-Salary	Actual	Oct	1	\$	20.00	\$	20.00
Oct Hours		N/A	Oct Hours from Planview		Salary	Actual	Oct	50	\$	86.62	\$	4,331.00
Nov Actuals		N/A	XC0219981WA65		Non-Salary	Actual	Nov	1	\$	551.37	\$	551.37
Nov Actuals		N/A	XC0219983DB		Non-Salary	Actual	Nov	1	\$	1,149.70	\$	1,149.70
Nov Actuals		N/A	XC0219974DB		Non-Salary	Actual	Nov	1	\$	1,516.77	\$	1,516.77
Nov Actuals		N/A	XC0219986EH		Non-Salary	Actual	Nov	1	\$	1,689.23	\$	1,689.23
Nov Actuals		N/A	FLOWSERVE FPD XC0219976		Non-Salary	Actual	Nov	1	\$	1,148.17	\$	1,148.17
Nov Actuals		N/A	EMPLY# 003439		Non-Salary	Actual	Nov	1	\$	3,980.00	\$	3,980.00
Nov Actuals		N/A	Nov Hours from Planview		Salary	Actual	Nov	58	\$	86.62	\$	5,023.96
Dec		N/A	Dec Hours from Planview		Salary	Actual	Dec	66.5	\$	86.62	\$	5,760.23
Jan		Calibration Tester	5/8" x 36" Plain Steel Cold Rolled Round Rod (Home Depot)		Non-Salary	Actual	Jan	1	\$	11.88	\$	11.88
Jan		Calibration Tester	Aluminum Crossover 1/2" Tube Diameter Heavy Duty Aluminum Clamp-on framing (McA)		Non-Salary	Actual	Jan	2	\$	35.16	\$	70.32

Appendix D:
Leakage Detection System,
Purchased Components

Leakage Measurement System Purchased Component List			
Part Name	Manufacturer	Item No./UPC	Source
iBalance 601 Digital Scale	MyWeigh	SCMiM01	DigitalScalesAZ
1/4" Electric Solenoid Valve	US Solid	853996003285	US Solid
1/4 NPT x 1/4 NPT HDPE Nipple	Thogus Products	62075	US Plastic
Optical Sensor	Honeywell Sensing and Controls	LLE101000	Newark.com
RS232 to USB Cable	Sabrent	CB-FTDI	Amazon.com
Hose Fittings	Dixon Valve and Coupling	40141734	Amazon.com
Anti-Vibration Pads	Ideaworks	JB6368 S/4	Amazon.com
Tubing	Watts	SVGE10	Amazon.com



1.888.978.7759

Jamco 3 Shelf Reinforced Mobile Table LE236 - 24 x 36 4800 Lb.

Availability: Usually ships in 10 to 13 days

Item #: WBB178123

Price: \$354.95



Product Information

This Mobile Table Easily Transports Materials Back and Forth Between Work Areas.

This table features all welded steel construction for remarkable durability. 12 gauge steel shelves with extra under bracing have a maximum capacity of 4,800 lb. 1-1/2" shelf lips down on both shelves for easy loading and unloading. 3/16" thick angled uprights. 8" phenolic bolt-on casters (2 swivel, 2 rigid) provide superior cart tracking. Includes three shelves. Gray powder coat finish. 1 Year Limited Warranty.

Product Specifications

LENGTH INCHES	36
WIDTH INCHES	24
HEIGHT INCHES	33
CAPACITY LBS	4800
COLOR FINISH	Gray
BRAND	Jamco
CONSTRUCTION	Steel
MANUFACTURERS PART NUMBER	LE236P8
SHELF QUANTITY	3
SHELF SPACING INCHES	9
TYPE	Reinforced Mobile Table
WHEEL DIAMETER INCHES	8
WHEEL TYPE	Phenolic

General Sales

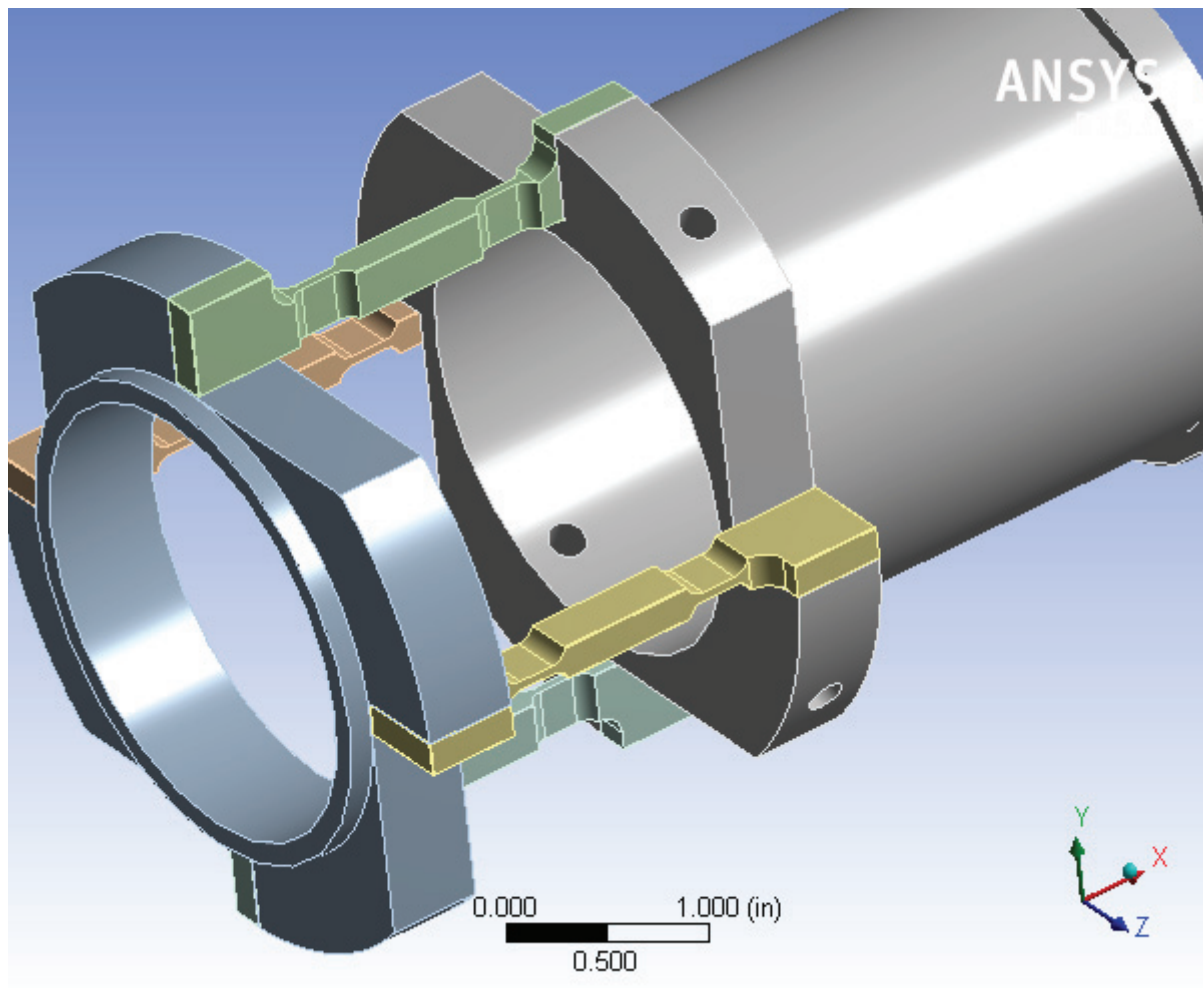
For product information or to place an order, please contact us at sales@globalindustrial.com, or 1-888-978-7759.

Appendix E1:
Torque Coupling Analysis



Project

Author	John Davis
Subject	Torque Coupling Strain Analysis
Prepared for	Cal Poly SEALS Team
First Saved	Monday, June 23, 2014
Last Saved	Tuesday, October 07, 2014
Product Version	15.0 Release
Save Project Before Solution	No
Save Project After Solution	No



Contents

- [Units](#)
- [Model \(B4\)](#)
 - [Geometry](#)
 - [Parts](#)
 - [Coordinate Systems](#)
 - [Connections](#)
 - [Contacts](#)
 - [Contact Regions](#)
 - [Mesh](#)
 - [Body Sizing](#)
 - [Static Structural \(B5\)](#)
 - [Analysis Settings](#)
 - [Loads](#)
 - [Solution \(B6\)](#)
 - [Solution Information](#)
 - [Results](#)
- [Material Data](#)
 - [Structural Steel](#)
 - [Titanium Alloy](#)

Units

TABLE 1

Unit System	U.S. Customary (in, lbm, lbf, s, V, A) Degrees rad/s Fahrenheit
Angle	Degrees
Rotational Velocity	rad/s
Temperature	Fahrenheit

Model (B4)

Geometry

TABLE 2
Model (B4) > Geometry

Object Name	Geometry
State	Fully Defined
Definition	
Source	C:\Users\jodavis\Documents\Vaults2012\FSDEngineering\Designs\Seal Jobs\1343-035\torquecoupling_RevC.iam
Type	Inventor
Length Unit	Centimeters
Element Control	Program Controlled
Display Style	Body Color
Bounding Box	
Length X	5.625 in

Length Y	3.6552 in
Length Z	3.6552 in
Properties	
Volume	7.6403 in ³
Mass	2.092 lbm
Scale Factor Value	1.
Statistics	
Bodies	6
Active Bodies	6
Nodes	576980
Elements	389950
Mesh Metric	None
Basic Geometry Options	
Solid Bodies	Yes
Surface Bodies	Yes
Line Bodies	No
Parameters	Yes
Parameter Key	DS
Attributes	No
Named Selections	No
Material Properties	No
Advanced Geometry Options	
Use Associativity	Yes
Coordinate Systems	No
Reader Mode Saves Updated File	No
Use Instances	Yes
Smart CAD Update	No
Compare Parts On Update	No
Attach File Via Temp File	Yes
Temporary Directory	C:\Users\jodavis\AppData\Local\Temp
Analysis Type	3-D
Mixed Import Resolution	None
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

TABLE 3
Model (B4) > Geometry > Parts

Object Name	<i>Coupling Hub Drive Shaft</i>	<i>Coupling Hub Driven Shaft</i>	<i>Strainbar_RevC:1</i>	<i>Strainbar_RevC:2</i>	<i>Strainbar_RevC:3</i>	<i>Strainbar_RevC:4</i>
-------------	---------------------------------	----------------------------------	-------------------------	-------------------------	-------------------------	-------------------------

	Rev A:1	Rev A:1				
State	Meshed					
Graphics Properties						
Visible	Yes					
Transparency	1					
Definition						
Suppressed	No					
Stiffness Behavior	Flexible					
Coordinate System	Default Coordinate System					
Reference Temperature	By Environment					
Material						
Assignment	Structural Steel	Titanium Alloy				
Nonlinear Effects	Yes					
Thermal Strain Effects	Yes					
Bounding Box						
Length X	3.25 in	0.625 in	2.75 in			
Length Y	3.6552 in		0.5 in	0.1875 in	0.5 in	0.1875 in
Length Z	3.6552 in		0.1875 in	0.5 in	0.1875 in	0.5 in
Properties						
Volume	4.8748 in³	2.1243 in³	0.1603 in³			
Mass	1.3825 lbm	0.60245 lbm	2.6756e-002 lbm			
Centroid X	1.3022 in	-2.0179 in	-0.87498 in			
Centroid Y	1.8658e-004 in	-8.4444e-009 in	1.5321 in	1.3355e-010 in	-1.5321 in	-1.3355e-010 in
Centroid Z	2.1182e-004 in	6.1471e-010 in	1.3355e-010 in	-1.5321 in	-1.3355e-010 in	1.5321 in
Moment of Inertia Ip1	2.5559 lbm·in²	1.3254 lbm·in²	5.5067e-004 lbm·in²			
Moment of Inertia Ip2	2.8774 lbm·in²	0.67792 lbm·in²	2.283e-002 lbm·in²	2.3234e-002 lbm·in²	2.283e-002 lbm·in²	2.3234e-002 lbm·in²
Moment of Inertia Ip3	2.8773 lbm·in²	0.67792 lbm·in²	2.3234e-002 lbm·in²	2.283e-002 lbm·in²	2.3234e-002 lbm·in²	2.283e-002 lbm·in²
Statistics						
Nodes	6579	2431	141992	141905	141928	142145
Elements	3392	1287	96313	96250	96285	96423
Mesh Metric	None					

Coordinate Systems

TABLE 4
Model (B4) > Coordinate Systems > Coordinate System

Coupling Hub Drive Shaft Rev A:1 To Strainbar_RevC:1	Coupling Hub Drive Shaft Rev A:1 To Strainbar_RevC:2	Coupling Hub Drive Shaft Rev A:1 To Strainbar_RevC:3	Coupling Hub Drive Shaft Rev A:1 To Strainbar_RevC:4	Coupling Hub Driven Shaft Rev A:1 To Strainbar_RevC:1	Coupling Hub Driven Shaft Rev A:1 To Strainbar_RevC:2	Coupling Hub Driven Shaft Rev A:1 To Strainbar_RevC:3	D St
Fully Defined							
Scope							
Geometry Selection							
1 Face							
1 Face							
Coupling Hub Drive Shaft Rev A:1				Coupling Hub Driven Shaft Rev A:1			
Strainbar_RevC:1	Strainbar_RevC:2	Strainbar_RevC:3	Strainbar_RevC:4	Strainbar_RevC:1	Strainbar_RevC:2	Strainbar_RevC:3	St
Definition							
Bonded							
Manual							
Program Controlled							
Program Controlled							
No							
Advanced							
Program Controlled							
Program Controlled							
Program Controlled							
Program Controlled							
Program Controlled							
Program Controlled							
Program Controlled							
Geometric Modification							
None							

FIGURE 1
 Model (B4) > Connections > Contacts > Bonded - Coupling Hub Drive Shaft Rev A:1 To
 Strainbar_RevC:1 > Figure
 Bonded contact assumption

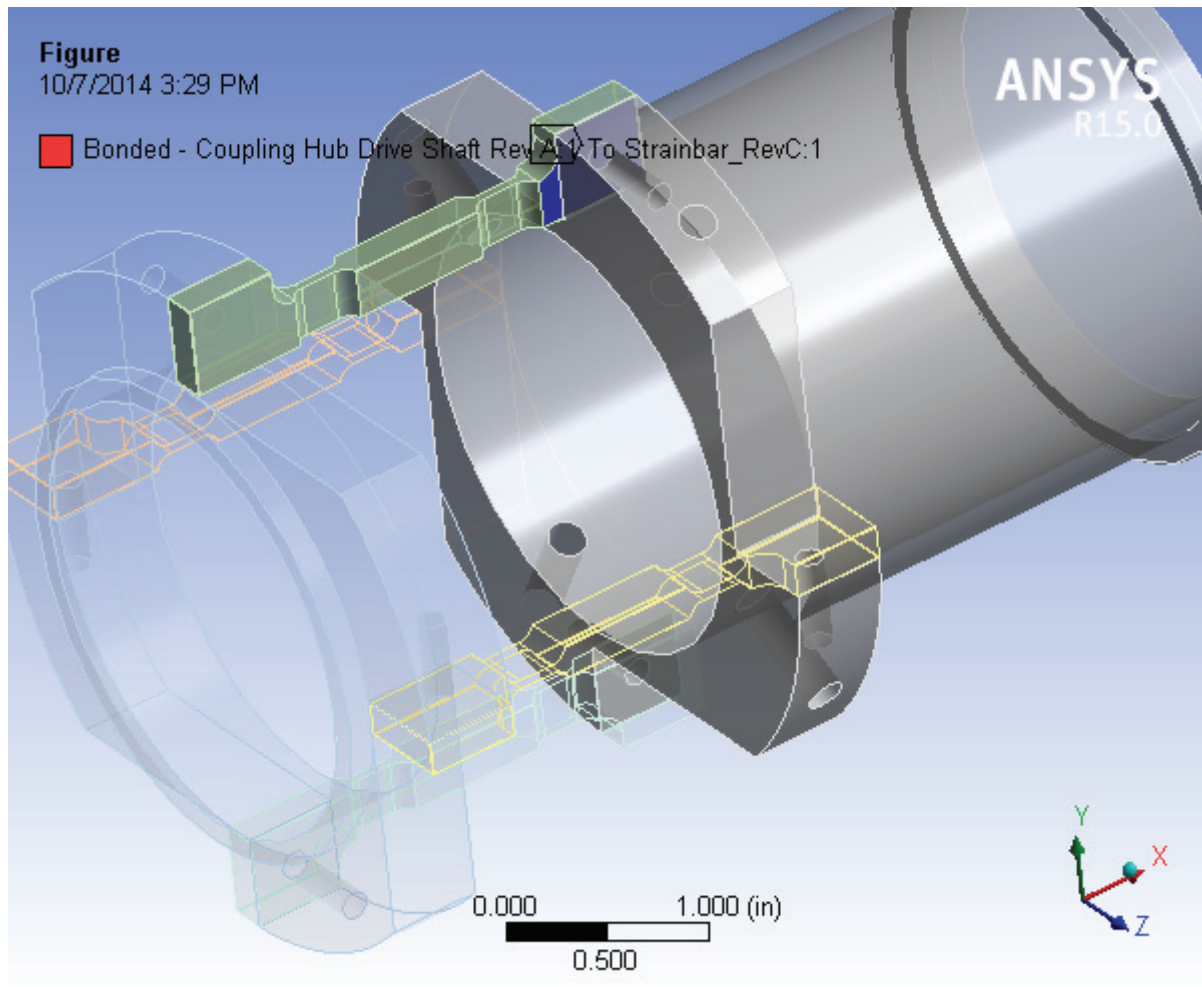
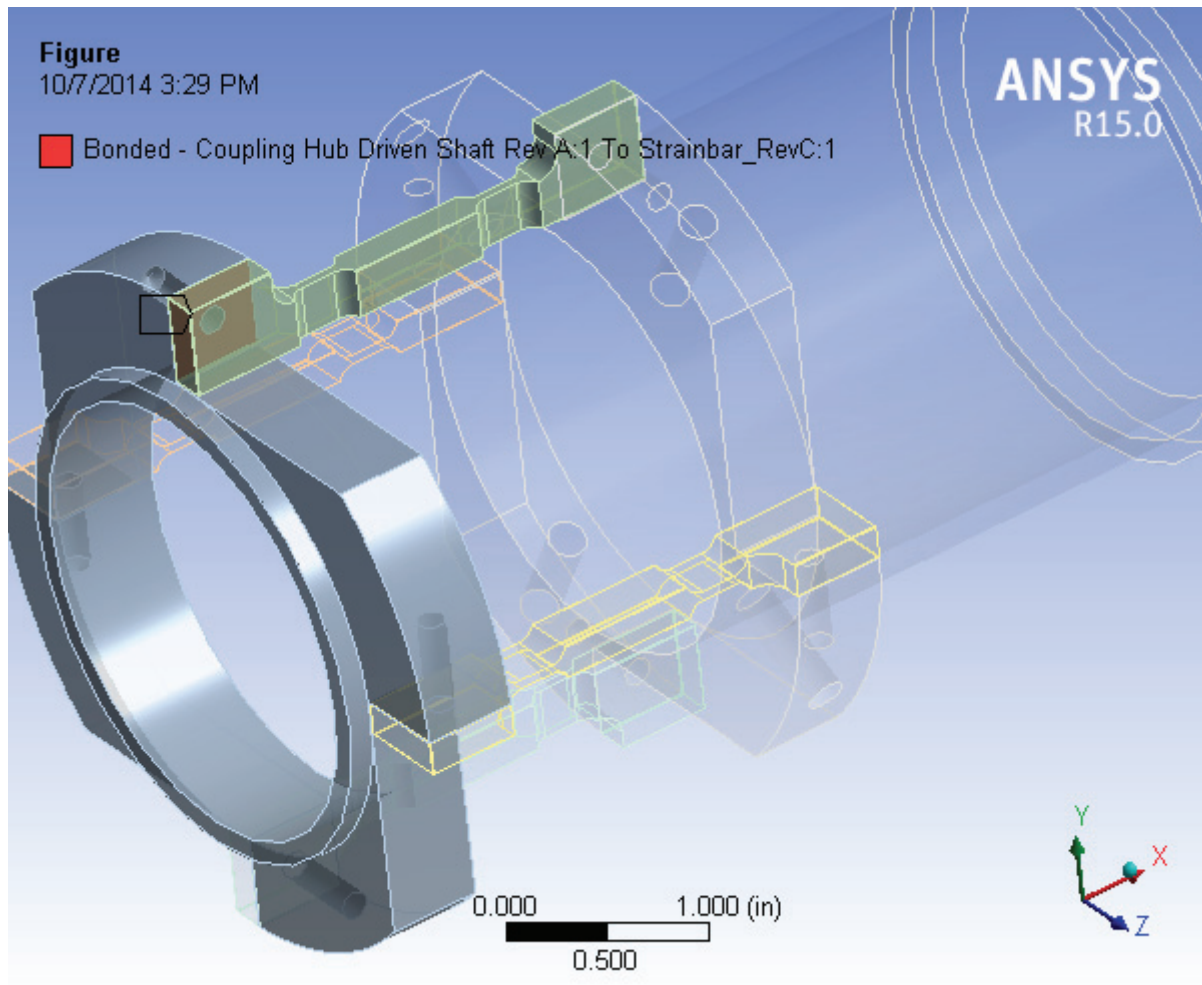


FIGURE 2
Model (B4) > Connections > Contacts > Bonded - Coupling Hub Driven Shaft Rev A:1 To Strainbar_RevC:1 > Figure
Bonded contact assumption



Mesh

TABLE 8
Model (B4) > Mesh

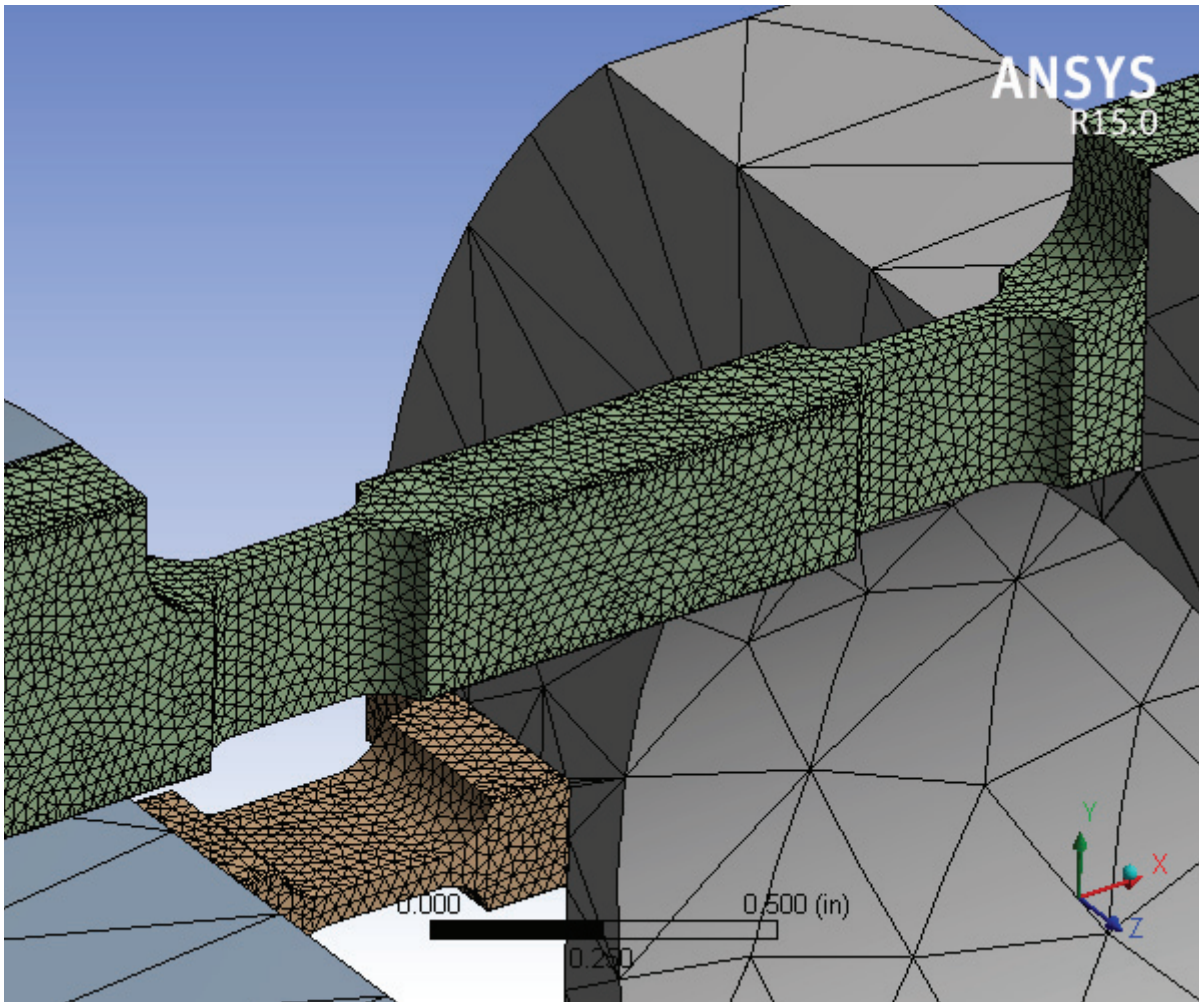
Object Name	<i>Mesh</i>
State	Solved
Defaults	
Physics Preference	Mechanical
Relevance	0
Sizing	
Use Advanced Size Function	Off
Relevance Center	Coarse
Element Size	Default
Initial Size Seed	Active Assembly
Smoothing	Medium
Transition	Fast
Span Angle Center	Coarse
Minimum Edge Length	7.0711e-003 in
Inflation	

Use Automatic Inflation	None
Inflation Option	Smooth Transition
Transition Ratio	0.272
Maximum Layers	5
Growth Rate	1.2
Inflation Algorithm	Pre
View Advanced Options	No
Patch Conforming Options	
Triangle Surface Mesher	Program Controlled
Patch Independent Options	
Topology Checking	Yes
Advanced	
Number of CPUs for Parallel Part Meshing	Program Controlled
Shape Checking	Standard Mechanical
Element Midside Nodes	Program Controlled
Straight Sided Elements	No
Number of Retries	Default (4)
Extra Retries For Assembly	Yes
Rigid Body Behavior	Dimensionally Reduced
Mesh Morphing	Disabled
Defeaturing	
Pinch Tolerance	Please Define
Generate Pinch on Refresh	No
Automatic Mesh Based Defeaturing	On
Defeaturing Tolerance	Default
Statistics	
Nodes	576980
Elements	389950
Mesh Metric	None

TABLE 9
Model (B4) > Mesh > Mesh Controls

Object Name	<i>Body Sizing</i>
State	Fully Defined
Scope	
Scoping Method	Geometry Selection
Geometry	4 Bodies
Definition	
Suppressed	No
Type	Element Size
Element Size	2.5e-002 in
Behavior	Soft

FIGURE 3
Model (B4) > Mesh > Figure
Mesh overview



Static Structural (B5)

TABLE 10
Model (B4) > Analysis

Object Name	<i>Static Structural (B5)</i>
State	Solved
Definition	
Physics Type	Structural
Analysis Type	Static Structural
Solver Target	Mechanical APDL
Options	
Environment Temperature	71.6 °F
Generate Input Only	No

TABLE 11
Model (B4) > Static Structural (B5) > Analysis Settings

Object Name	<i>Analysis Settings</i>
State	Fully Defined
Step Controls	

Number Of Steps	1.
Current Step Number	1.
Step End Time	1. s
Auto Time Stepping	Program Controlled
Solver Controls	
Solver Type	Program Controlled
Weak Springs	Program Controlled
Large Deflection	Off
Inertia Relief	Off
Restart Controls	
Generate Restart Points	Program Controlled
Retain Files After Full Solve	No
Nonlinear Controls	
Newton-Raphson Option	Program Controlled
Force Convergence	Program Controlled
Moment Convergence	Program Controlled
Displacement Convergence	Program Controlled
Rotation Convergence	Program Controlled
Line Search	Program Controlled
Stabilization	Off
Output Controls	
Stress	Yes
Strain	Yes
Nodal Forces	No
Contact Miscellaneous	No
General Miscellaneous	No
Store Results At	All Time Points
Analysis Data Management	
Solver Files Directory	C:\Users\jodavis\Documents\Ansys Analysis\1343-035\torquecoupling_RevC_files\dp0\SYS\MECH\
Future Analysis	None
Scratch Solver Files Directory	
Save MAPDL db	No
Delete Unneeded Files	Yes
Nonlinear Solution	No
Solver Units	Active System
Solver Unit System	Bin

TABLE 12
Model (B4) > Static Structural (B5) > Loads

Model (24) - Static Structural (26) - Loads			
Object Name	<i>Fixed Support</i>	<i>Cylindrical Support</i>	<i>Moment</i>
State	Fully Defined		
Scope			
Scoping Method	Geometry Selection		

Geometry	1 Face		
Definition			
Type	Fixed Support	Cylindrical Support	Moment
Suppressed	No		
Radial		Fixed	
Axial		Fixed	
Tangential		Free	
Define By			Vector
Magnitude			50. lbf-in (ramped)
Direction			Defined
Behavior			Deformable
Advanced			
Pinball Region			All

FIGURE 4
Model (B4) > Static Structural (B5) > Fixed Support > Figure
Fixed support BC

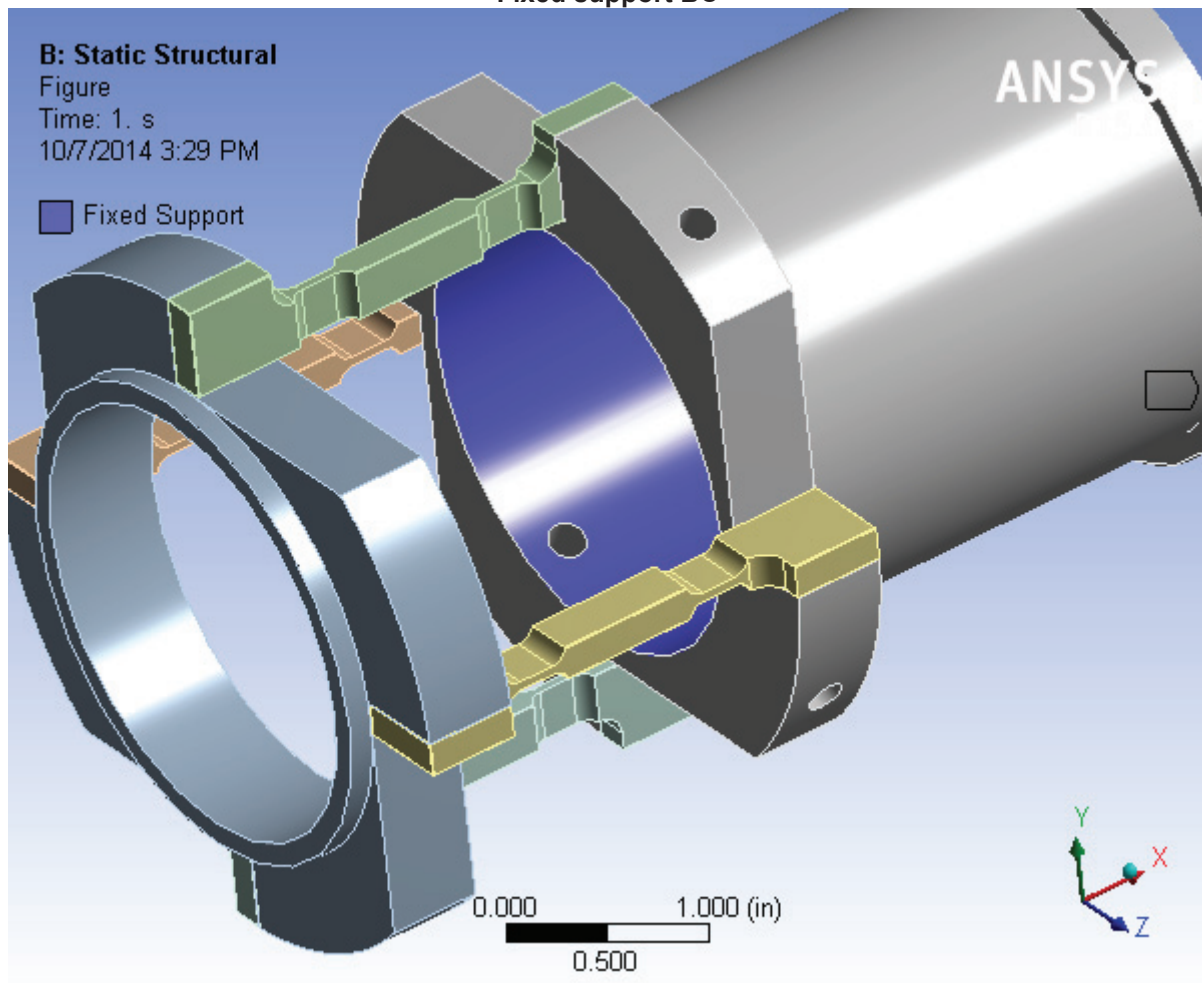


FIGURE 5
Model (B4) > Static Structural (B5) > Cylindrical Support > Figure
Cyl support BC

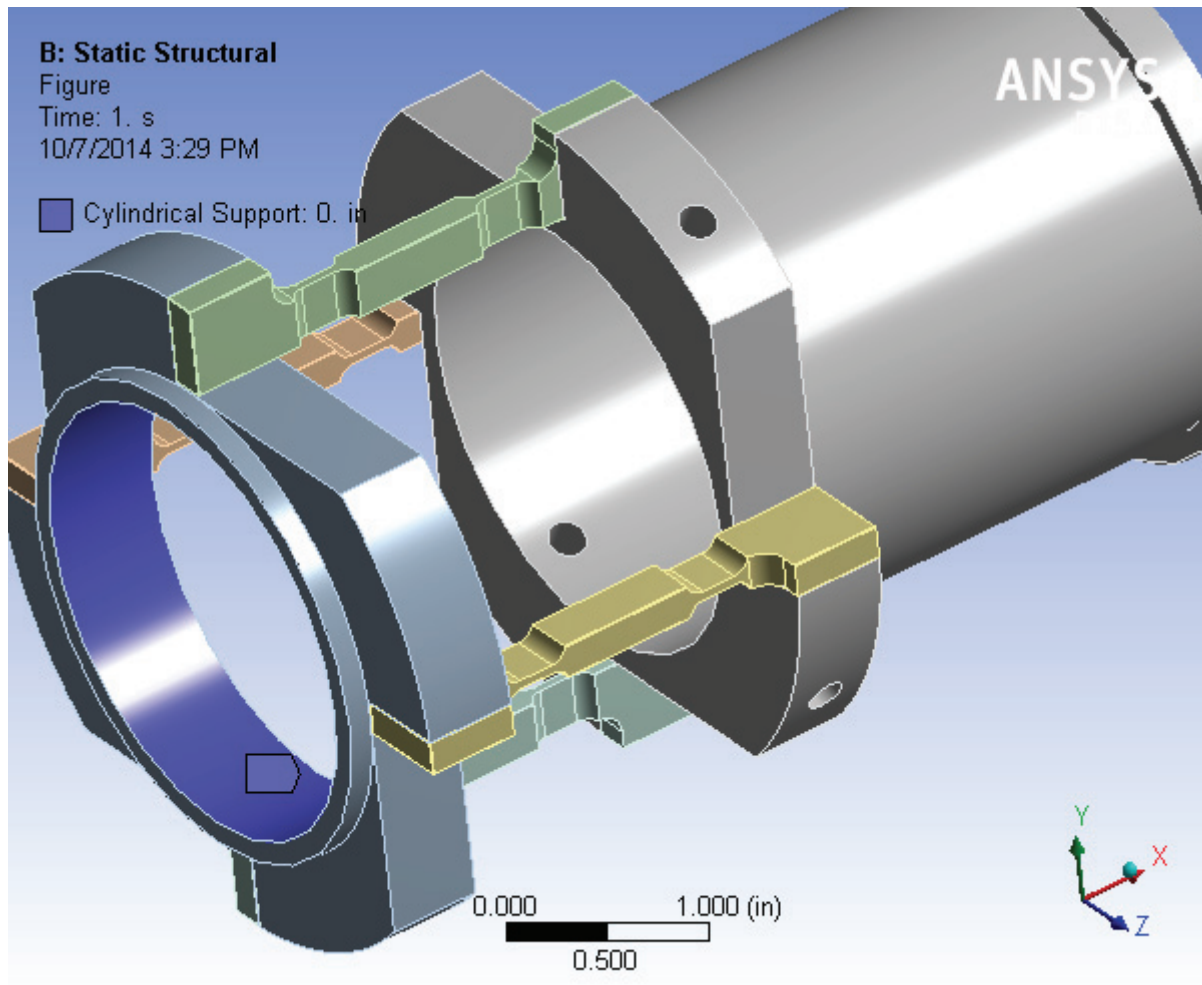


FIGURE 6
Model (B4) > Static Structural (B5) > Moment

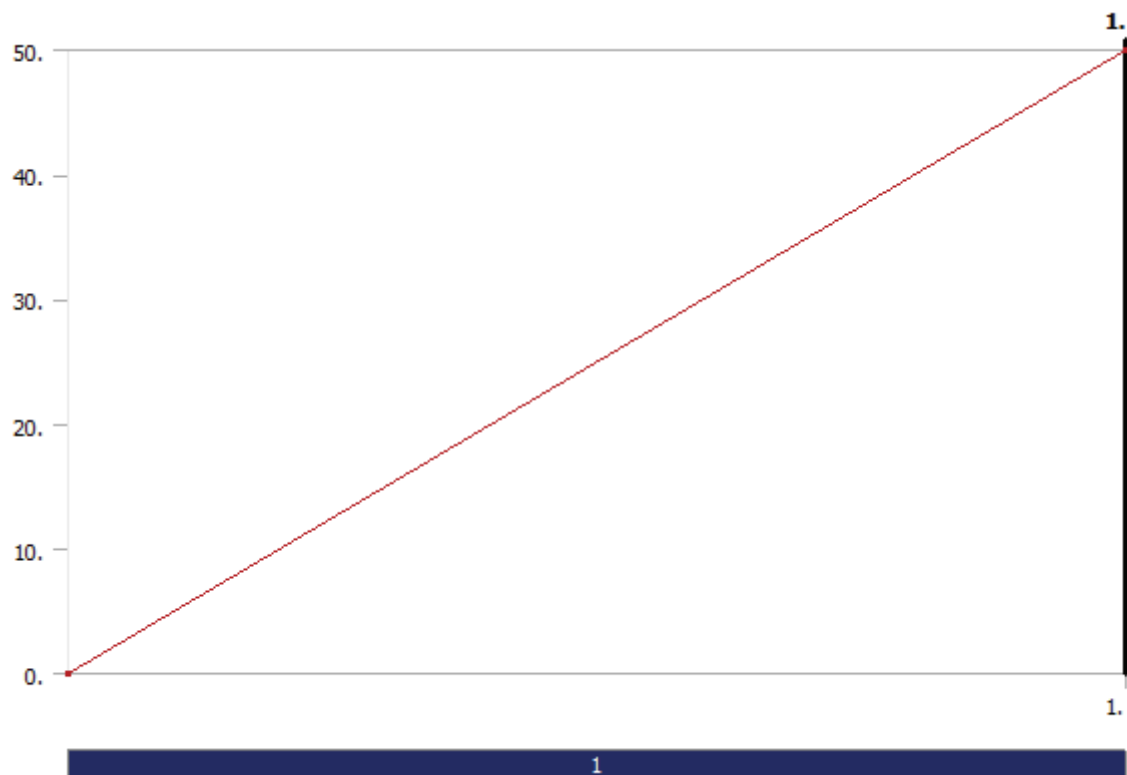
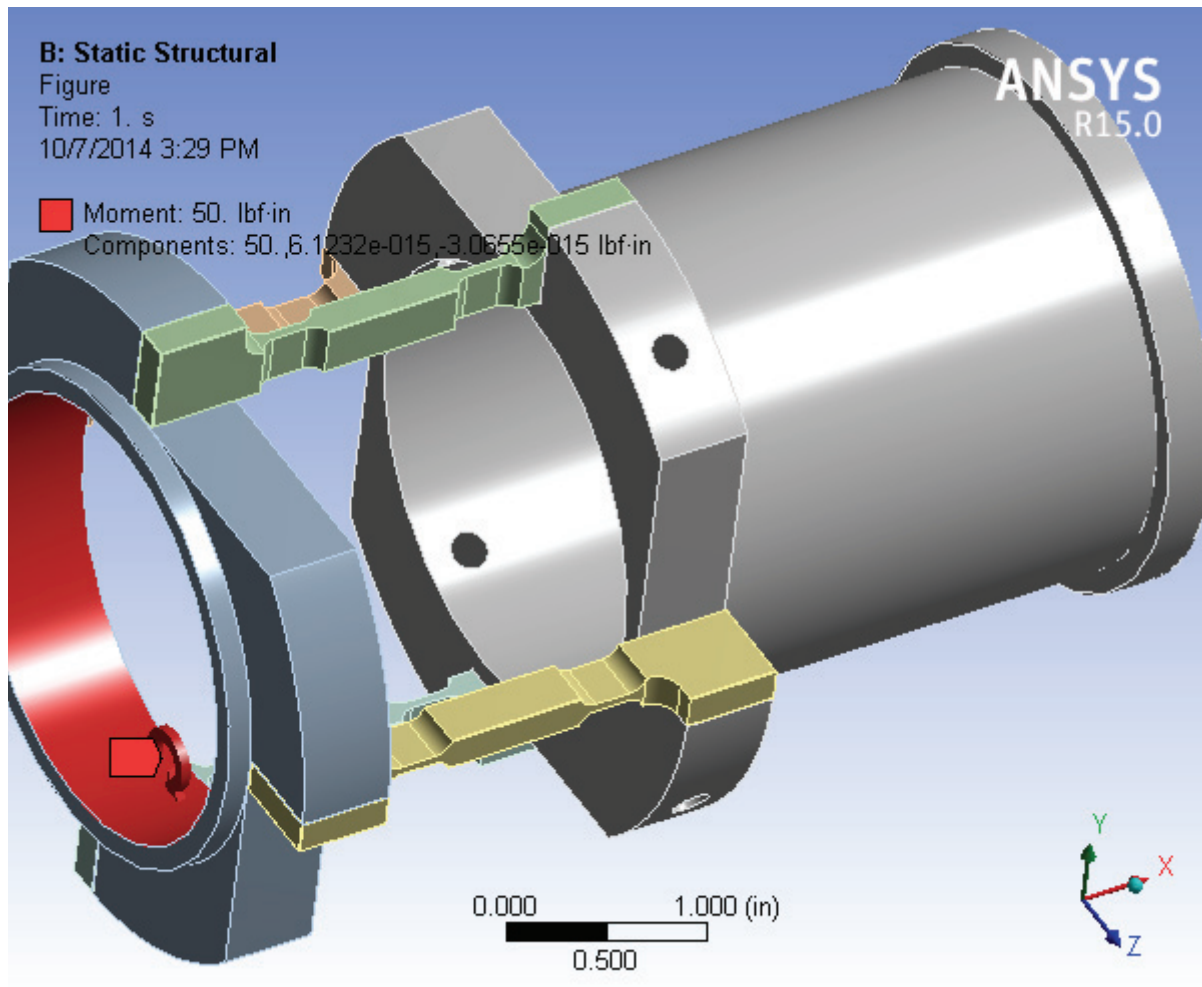


FIGURE 7
Model (B4) > Static Structural (B5) > Moment > Figure
Applied torque BC 50 in-lbs max



Solution (B6)

TABLE 13
Model (B4) > Static Structural (B5) > Solution

Object Name	<i>Solution (B6)</i>
State	Solved
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.
Information	
Status	Done

TABLE 14
Model (B4) > Static Structural (B5) > Solution (B6) > Solution Information

Object Name	<i>Solution Information</i>
State	Solved
Solution Information	
Solution Output	Solver Output
Newton-Raphson Residuals	0

Update Interval	2.5 s
Display Points	All
FE Connection Visibility	
Activate Visibility	Yes
Display	All FE Connectors
Draw Connections Attached To	All Nodes
Line Color	Connection Type
Visible on Results	No
Line Thickness	Single
Display Type	Lines

TABLE 15
Model (B4) > Static Structural (B5) > Solution (B6) > Results

Object Name	Equivalent Elastic Strain	Maximum Principal Stress	Equivalent Stress
State	Solved		
Scope			
Scoping Method	Geometry Selection		
Geometry	All Bodies		
Definition			
Type	Equivalent Elastic Strain	Maximum Principal Stress	Equivalent (von-Mises) Stress
By	Time		
Display Time	Last		
Calculate Time History	Yes		
Identifier			
Suppressed	No		
Integration Point Results			
Display Option	Averaged		
Average Across Bodies	No		
Results			
Minimum	1.5205e-015 in/in	-2628.4 psi	9.5482e-009 psi
Maximum	3.1696e-003 in/in	53968 psi	52261 psi
Minimum Occurs On	Coupling Hub Drive Shaft Rev A:1	Strainbar_RevC:4	Coupling Hub Drive Shaft Rev A:1
Maximum Occurs On	Strainbar_RevC:2	Strainbar_RevC:3	Strainbar_RevC:2
Minimum Value Over Time			
Minimum	1.5205e-015 in/in	-2628.4 psi	9.5482e-009 psi
Maximum	1.5205e-015 in/in	-2628.4 psi	9.5482e-009 psi
Maximum Value Over Time			
Minimum	3.1696e-003 in/in	53968 psi	52261 psi
Maximum	3.1696e-003 in/in	53968 psi	52261 psi
Information			
Time	1. s		
Load Step	1		
Substep	1		

FIGURE 8

Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Elastic Strain > Image

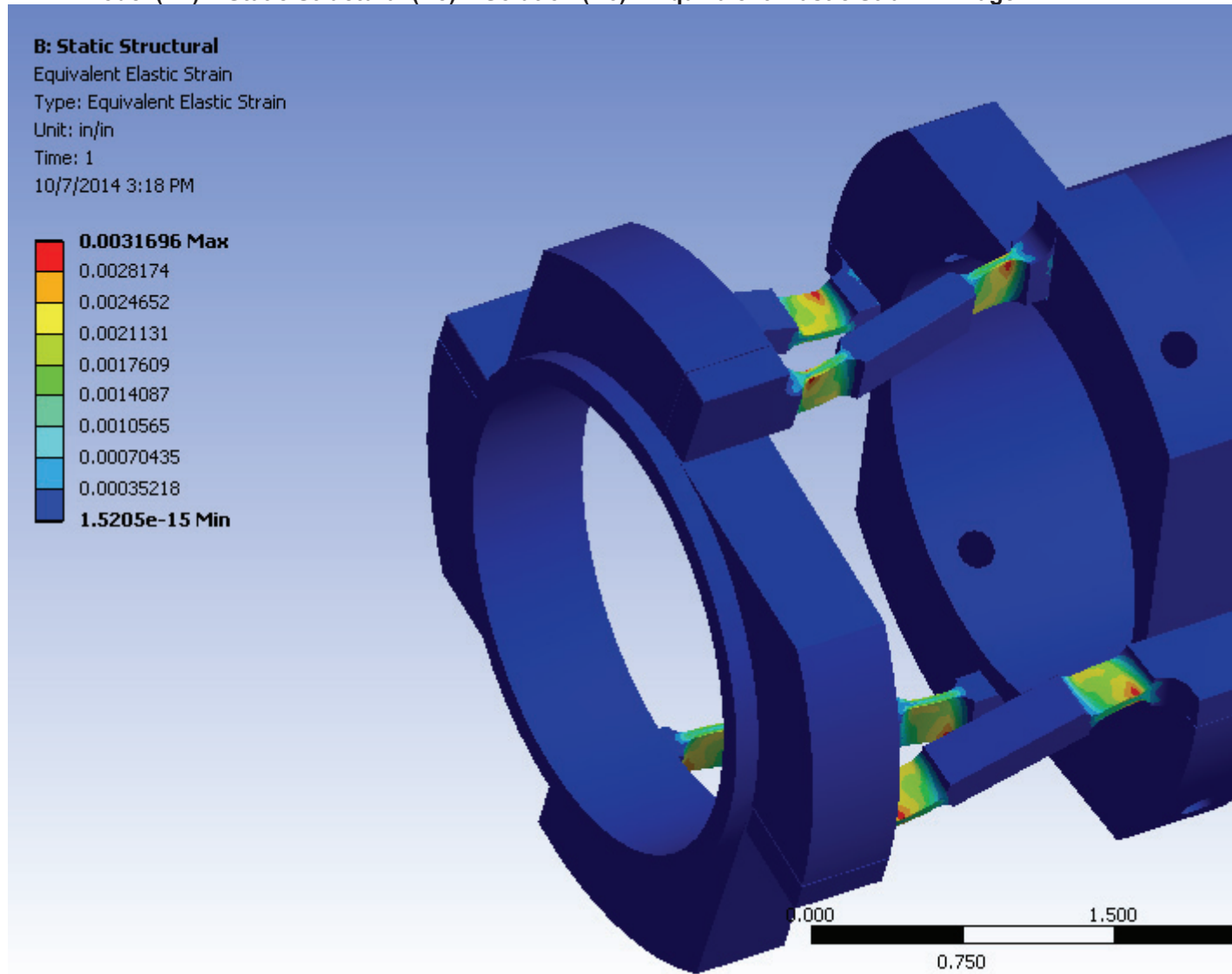


FIGURE 9

Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Elastic Strain > Figure
Equiv elastic strain 50 in-lbs applied torque

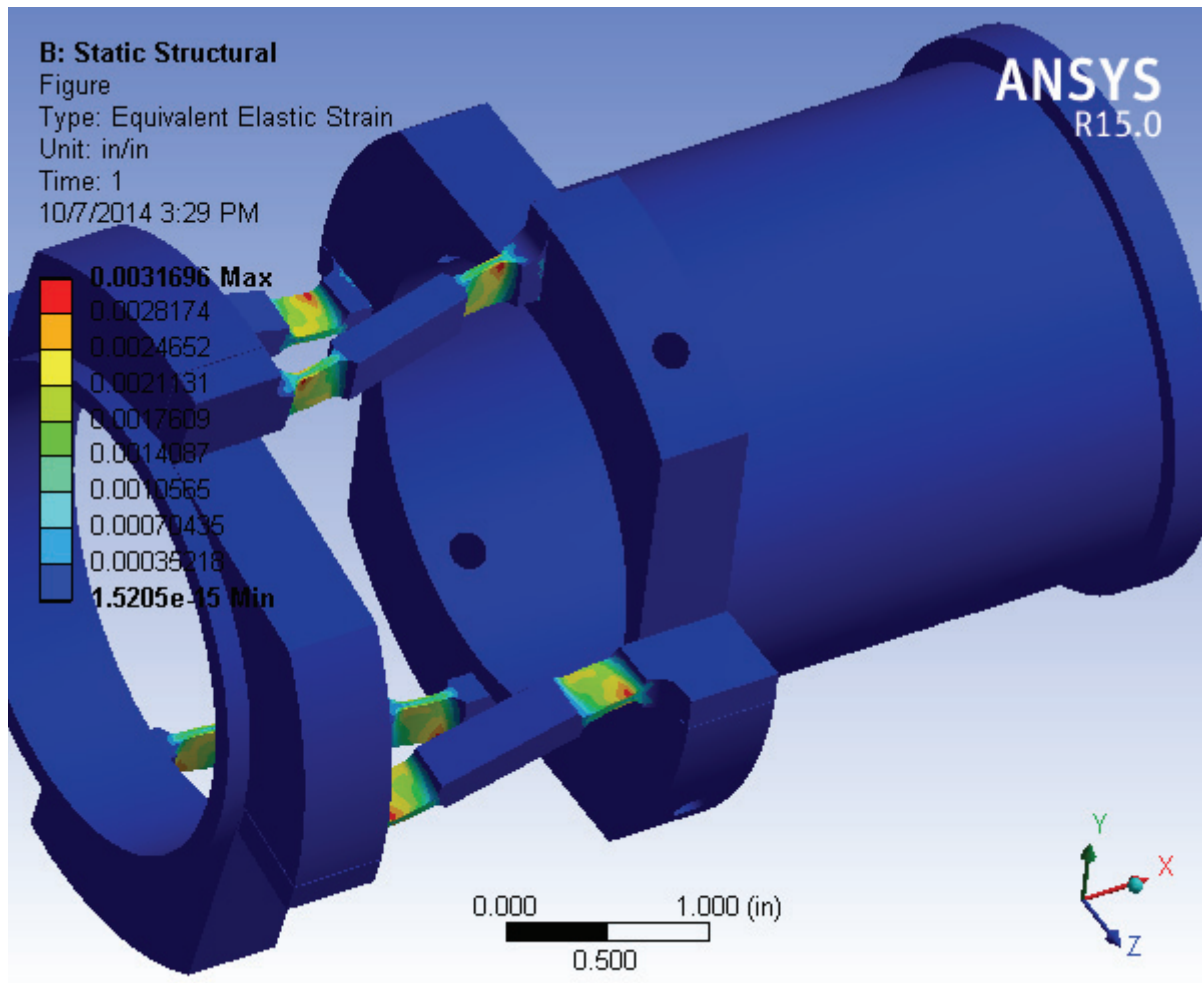


FIGURE 10
Model (B4) > Static Structural (B5) > Solution (B6) > Maximum Principal Stress > Figure
Max principle stress 50 in-lbs applied torque

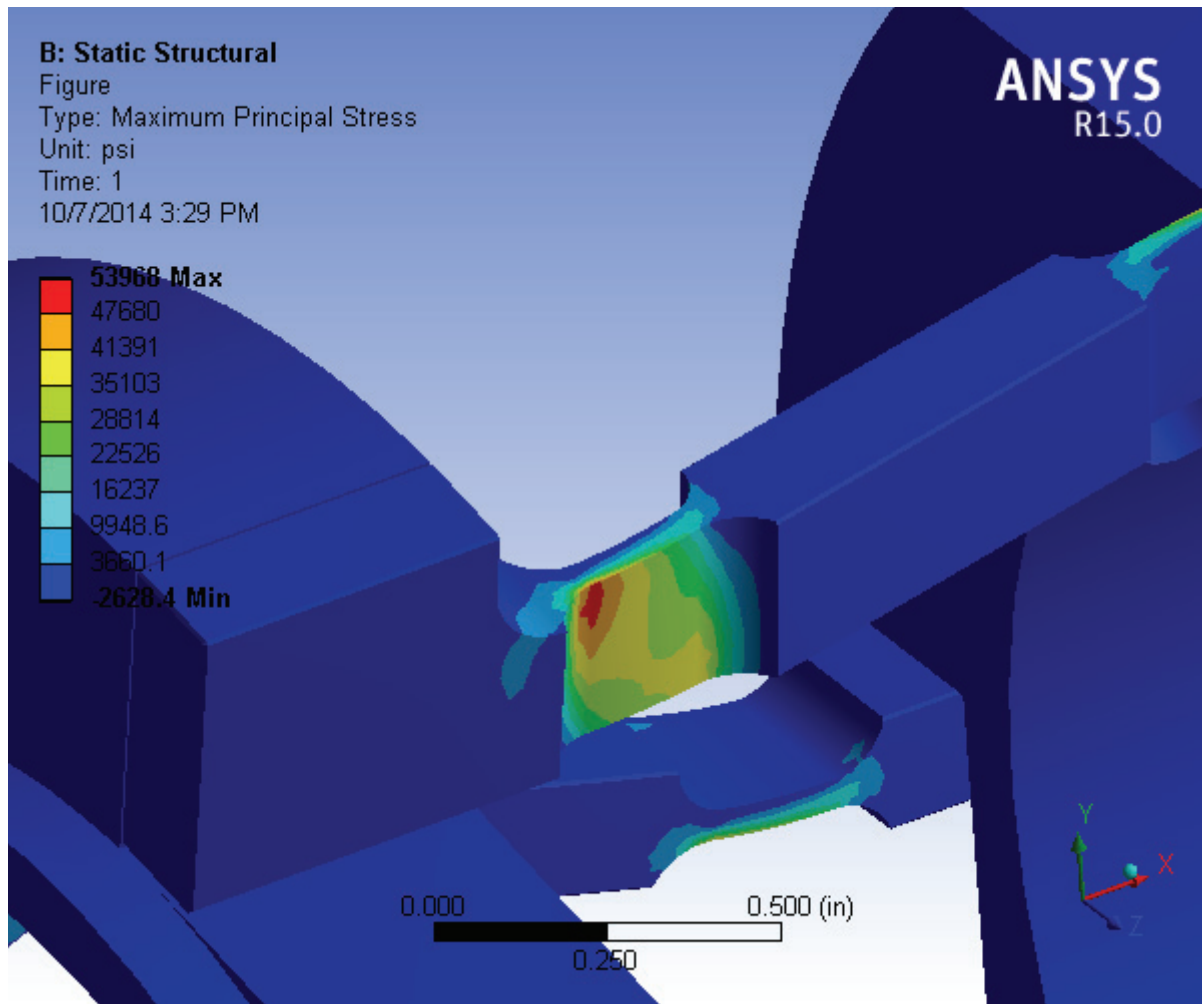
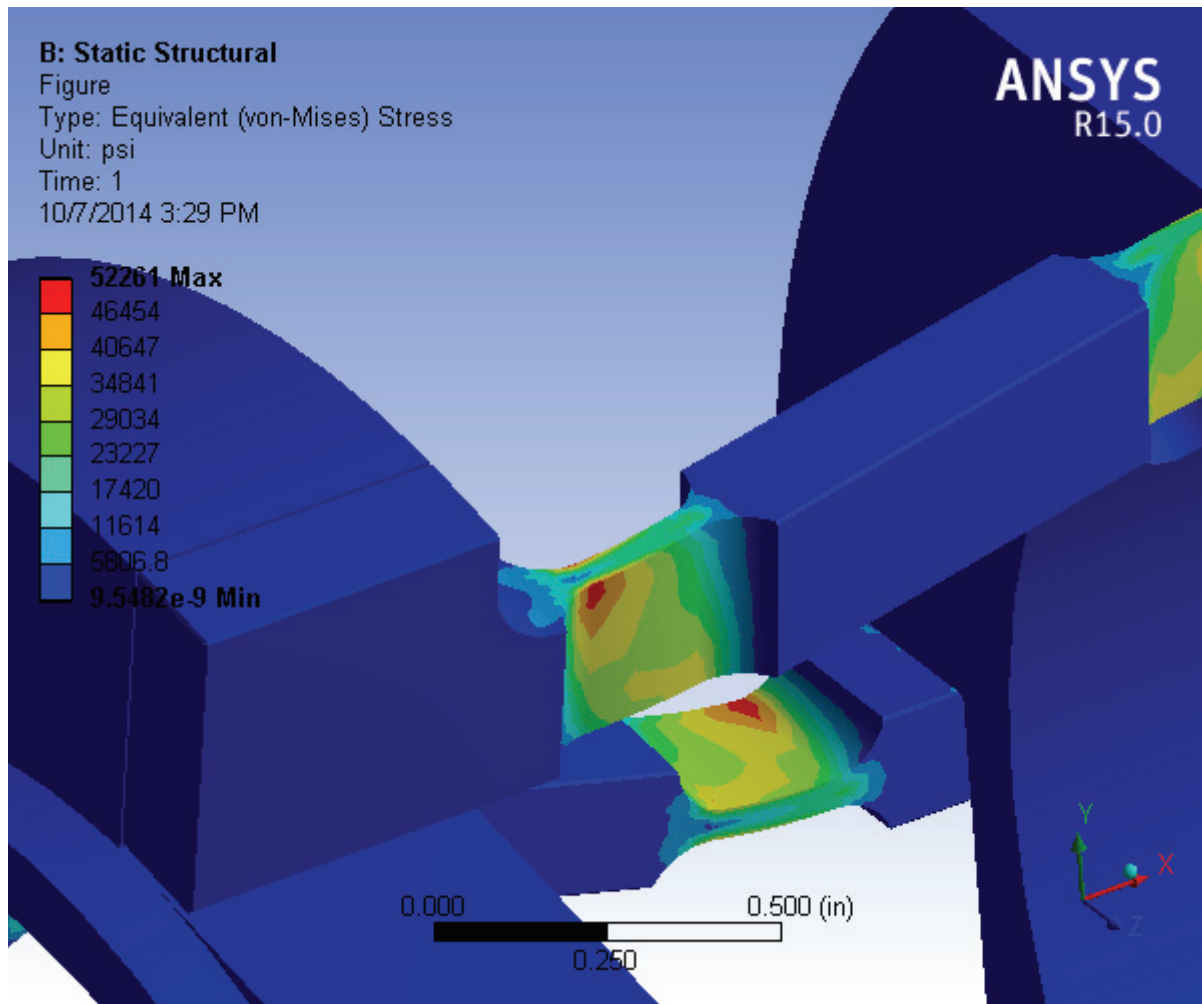


FIGURE 11
Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Stress > Figure
Von Mises Stress 50 in-lbs applied torque



Material Data

Structural Steel

TABLE 16
Structural Steel > Constants

Density	0.2836 lbm in ⁻³
Coefficient of Thermal Expansion	6.6667e-006 F ⁻¹
Specific Heat	0.10366 BTU lbm ⁻¹ F ⁻¹
Thermal Conductivity	8.0917e-004 BTU s ⁻¹ in ⁻¹ F ⁻¹
Resistivity	8.5235 ohm cmil in ⁻¹

TABLE 17
Structural Steel > Compressive Ultimate Strength

Compressive Ultimate Strength psi
0

TABLE 18
Structural Steel > Compressive Yield Strength

Compressive Yield Strength psi
36259

TABLE 19
Structural Steel > Tensile Yield Strength

Tensile Yield Strength psi
36259

TABLE 20
Structural Steel > Tensile Ultimate Strength

Tensile Ultimate Strength psi
66717

TABLE 21
Structural Steel > Isotropic Secant Coefficient of Thermal Expansion

Reference Temperature F
71.6

TABLE 22
Structural Steel > Alternating Stress Mean Stress

Alternating Stress psi	Cycles	Mean Stress psi
5.8001e+005	10	0
4.1002e+005	20	0
2.7499e+005	50	0
2.0494e+005	100	0
1.5505e+005	200	0
63962	2000	0
38000	10000	0
31038	20000	0
20015	1.e+005	0
16534	2.e+005	0
12502	1.e+006	0

TABLE 23
Structural Steel > Strain-Life Parameters

Strength Coefficient psi	Strength Exponent	Ductility Coefficient	Ductility Exponent	Cyclic Strength Coefficient psi	Cyclic Strain Hardening Exponent
1.3343e+005	-0.106	0.213	-0.47	1.4504e+005	0.2

TABLE 24
Structural Steel > Isotropic Elasticity

Temperature F	Young's Modulus psi	Poisson's Ratio	Bulk Modulus psi	Shear Modulus psi
	2.9008e+007	0.3	2.4173e+007	1.1157e+007

TABLE 25
Structural Steel > Isotropic Relative Permeability

Relative Permeability
10000

Titanium Alloy

TABLE 26
Titanium Alloy > Constants

Density	0.16691 lbm in ⁻³
Coefficient of Thermal Expansion	5.2222e-006 F ⁻¹
Specific Heat	0.12468 BTU lbm ⁻¹ F ⁻¹
Thermal Conductivity	2.9291e-004 BTU s ⁻¹ in ⁻¹ F ⁻¹
Resistivity	85.235 ohm cmil in ⁻¹

TABLE 27
Titanium Alloy > Compressive Ultimate Strength

Compressive Ultimate Strength psi
0

TABLE 28
Titanium Alloy > Compressive Yield Strength

Compressive Yield Strength psi
1.3489e+005

TABLE 29
Titanium Alloy > Tensile Yield Strength

Tensile Yield Strength psi
1.3489e+005

TABLE 30
Titanium Alloy > Tensile Ultimate Strength

Tensile Ultimate Strength psi
1.5519e+005

TABLE 31
Titanium Alloy > Isotropic Secant Coefficient of Thermal Expansion

Reference Temperature F
71.6

TABLE 32
Titanium Alloy > Isotropic Elasticity

Temperature F	Young's Modulus psi	Poisson's Ratio	Bulk Modulus psi	Shear Modulus psi
	1.65e+007	0.342	1.7405e+007	6.1475e+006

TABLE 33
Titanium Alloy > Isotropic Relative Permeability

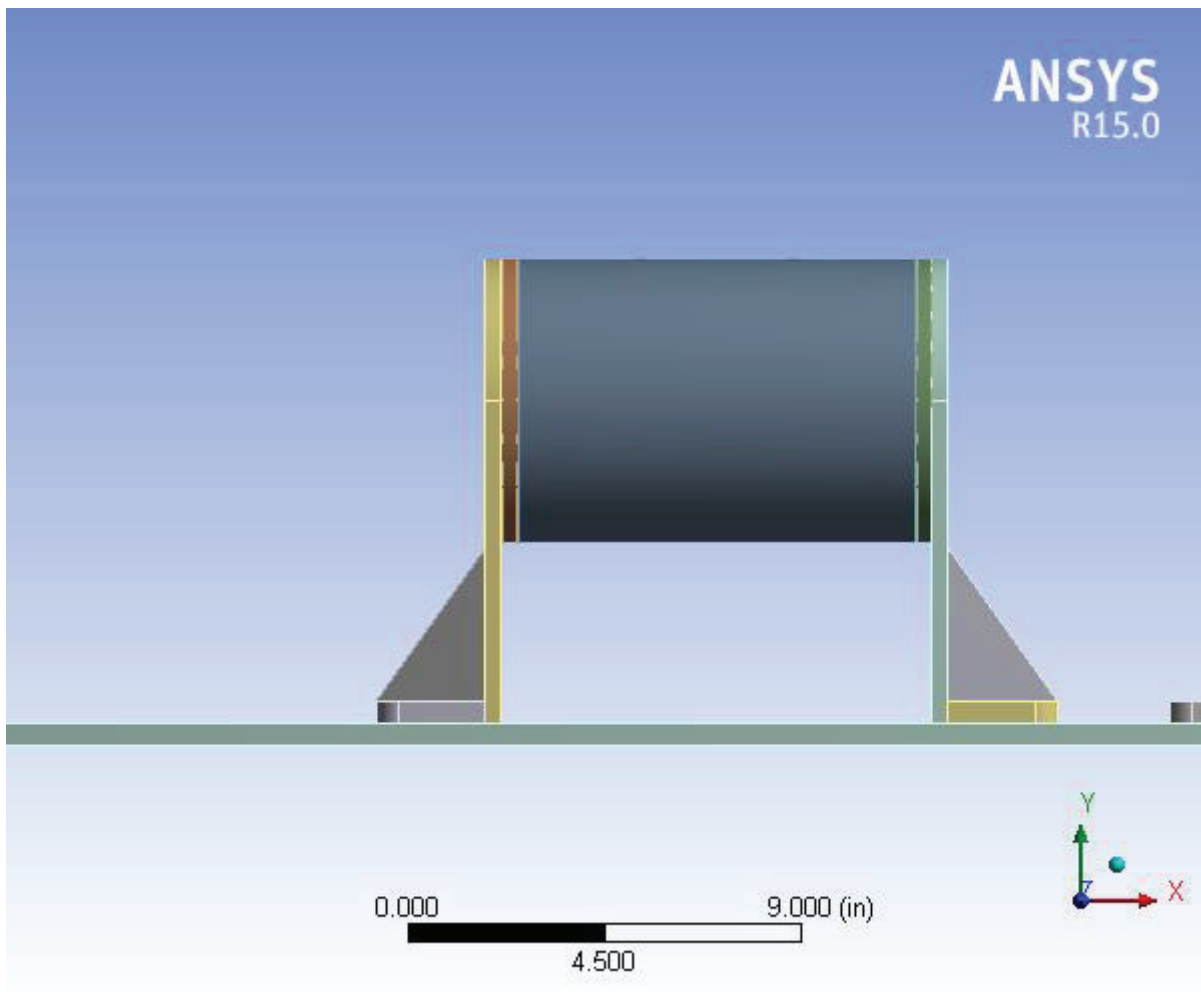
Relative Permeability
1

Appendix E2:
Tester Support Analysis



Project

Author	John Davis
Subject	Tester Support Deformation Analysis
Prepared for	Cal Poly SEALS Team
First Saved	Tuesday, July 22, 2014
Last Saved	Tuesday, October 07, 2014
Product Version	15.0 Release
Save Project Before Solution	No
Save Project After Solution	No



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Units

TABLE 1

Unit System	U.S. Customary (in, lbm, lbf, s, V, A) Degrees rad/s Fahrenheit
Angle	Degrees
Rotational Velocity	rad/s
Temperature	Fahrenheit

Model (B4)

Geometry

TABLE 2
Model (B4) > Geometry

Object Name	Geometry
State	Fully Defined
Definition	
Source	C:\Users\jodavis\Documents\Vaults2012\FSDEngineering\Designs\Seal Jobs\1343-035\SealHousingRevD_Ansys.iam
Type	Inventor
Length Unit	Centimeters
Element Control	Program Controlled
Display Style	Body Color
Bounding Box	
Length X	36. in
Length Y	11.878 in

Length Z	18. in
Properties	
Volume	726.94 in³
Mass	206.16 lbm
Scale Factor Value	1.
Statistics	
Bodies	21
Active Bodies	21
Nodes	142047
Elements	71869
Mesh Metric	None
Basic Geometry Options	
Solid Bodies	Yes
Surface Bodies	Yes
Line Bodies	No
Parameters	Yes
Parameter Key	DS
Attributes	No
Named Selections	No
Material Properties	No
Advanced Geometry Options	
Use Associativity	Yes
Coordinate Systems	No
Reader Mode Saves Updated File	No
Use Instances	Yes
Smart CAD Update	No
Compare Parts On Update	No
Attach File Via Temp File	Yes
Temporary Directory	C:\Users\jodavis\AppData\Local\Temp
Analysis Type	3-D
Mixed Import Resolution	None
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

TABLE 3
Model (B4) > Geometry > Parts

Object Name	<i>HsgPlate:1</i>	<i>BrgMtBottom:1</i>	<i>Gusset:1</i>	<i>Gusset_MIR:1</i>	<i>Primary Gland:1</i>	<i>BrgHousing:1</i>	<i>BearingHsgEndplate-SealSide:1</i>	<i>BearingHsgEndplate-</i>	<i>GlandSupport:1</i>	<i>GlandSupport:2</i>	<i>TopPlate:1</i>
-------------	-------------------	----------------------	-----------------	---------------------	------------------------	---------------------	--------------------------------------	----------------------------	-----------------------	-----------------------	-------------------

								MotorSide: 1			
State	Meshed										
Graphics Properties											
Visible	Yes										
Transp arency	1										
Definition											
Suppr essed	No										
Stiffne ss Behavi or	Flexible										
Coordi nate Syste m	Default Coordinate System										
Refere nce Tempe rature	By Environment										
Material											
Assign ment	Structural Steel										
Nonlin ear Effects	Yes										
Therm al Strain Effects	Yes										
Bounding Box											
Length X	0.375 in	2.5 in		3.188 in	9.0915 in	0.75 in		3. in			
Length Y	10.60 8 in	0.5 in	3.5 in	8.0003 in	6.5001 in	6.5 in		3.5 in	0.75 in		
Length Z	6.46 in		0.375 in	7.5 in	6.5 in			3.5 in	3. in		
Properties											
Volum e	20.90 9 in³	7.7624 in³	1.6406 in³	95.675 in³	139.97 in³	12.145 in³	12.199 in³	10.622 in³	6.36 7 in³		
Mass	5.929 6 lbm	2.2014 lbm	0.46528 lbm	27.133 lbm	39.695 lbm	3.4443 lbm	3.4596 lbm	3.0123 lbm	1.80 57 lbm		
Centro id X	- 6.247 2 in	-4.8239 in	-5.2264 in	1.4414 in	- 11.357 in	-6.6991 in	-16.012 in	1.5 in			
Centro id Y	- 2.750 6 in	-7.1281 in	-5.7114 in	- 4.7503 e-003 in	- 9.1943 e-004 in	3.802e- 008 in	3.765e- 008 in	-1.0167 in	- 2.50 31 in		

Centro id Z	2.981 2e-015 in	- 6.8003 e-015 in	1.81 25 in	- 1.8125 in	- 1.4747 e-007 in	5.2352 e-016 in	-1.5859e- 010 in	1.5789e- 010 in	4.8479 in	-4.8479 in	5.74 35 in
Mome nt of Inertia Ip1	72.03 4 lbm·i n²	7.3593 lbm·in²	0.38168 lbm·in²		282.65 lbm·in²	319.57 lbm·in²	20.092 lbm·in²	20.123 lbm·in²	6.2882 lbm·in²		1.39 85 lbm·i n²
Mome nt of Inertia Ip2	21.35 6 lbm·i n²	8.4592 lbm·in²	0.10743 lbm·in²		158.21 lbm·in²	429.64 lbm·in²	10.155 lbm·in²	10.17 lbm·in²	3.409 lbm·in²		2.61 18 lbm·i n²
Mome nt of Inertia Ip3	50.81 7 lbm·i n²	1.1917 lbm·in²	0.4782 lbm·in²		167.15 lbm·in²	429.54 lbm·in²	10.155 lbm·in²	10.17 lbm·in²	6.7527 lbm·in²		1.38 26 lbm·i n²
Statistics											
Nodes	1395	666	188	181	27246	35729	27331	27361	3727	3588	1133
Eleme nts	167	75	20	19	15599	20681	14691	14778	2011	1925	168
Mesh Metric	None										

TABLE 4
Model (B4) > Geometry > Parts

Object Name	<i>Tubing-1:1</i>	<i>LowerPlate:1</i>	<i>TopPlate:1 (2)</i>	<i>Tubing-1:1 (2)</i>	<i>LowerPlate:1 (2)</i>	<i>Baseplate:1</i>	<i>HsgPlate:1 (2)</i>	<i>BrgMtBottom:1 (2)</i>	<i>Gusset:1 (2)</i>	<i>Gusset_MIR:1 (2)</i>
State	Meshed									
Graphics Properties										
Visible	Yes									
Transparency	1									
Definition										
Suppressed	No									
Stiffness Behavior	Flexible									
Coordinate System	Default Coordinate System									
Reference Temperature	By Environment									
Material										
Assignment	Structural Steel									
Nonlinear Effects	Yes									

Thermal Strain Effects	Yes									
Bounding Box										
Length X	3. in	5. in	3. in		5. in	36. in	0.375 in	2.5 in		
Length Y	4. in	0.5 in	0.75 in	4. in	0.5 in		10.608 in	0.5 in	3.5 in	
Length Z	3. in	5. in	3. in		5. in	18. in	6.46 in		0.375 in	
Properties										
Volume	11. in³	12.134 in³	6.367 in³	11. in³	12.134 in³	322.8 in³	20.909 in³	7.7624 in³	1.6406 in³	
Mass	3.1196 lbm	3.4411 lbm	1.8057 lbm	3.1196 lbm	3.4411 lbm	91.546 lbm	5.9296 lbm	2.2014 lbm	0.46528 lbm	
Centroid X	1.5 in					-13.946 in	-16.464 in	-17.887 in	-17.485 in	
Centroid Y	-4.8781 in	-7.1281 in	-2.5031 in	-4.8781 in	-7.1281 in	-7.6281 in	-2.7506 in	-7.1281 in	-5.7114 in	
Centroid Z	5.75 in		-5.7435 in	-5.75 in		2.924e-009 in	-2.7201e-016 in	-5.1823e-014 in	-1.8125 in	1.8125 in
Moment of Inertia Ip1	7.9667 lbm·in²	7.0237 lbm·in²	1.3985 lbm·in²	7.9667 lbm·in²	7.0237 lbm·in²	2468.2 lbm·in²	72.034 lbm·in²	7.3593 lbm·in²	0.38168 lbm·in²	
Moment of Inertia Ip2	7.6146 lbm·in²	13.904 lbm·in²	2.6118 lbm·in²	7.6146 lbm·in²	13.904 lbm·in²	12325 lbm·in²	21.356 lbm·in²	8.4592 lbm·in²	0.10743 lbm·in²	
Moment of Inertia Ip3	7.9667 lbm·in²	7.0237 lbm·in²	1.3826 lbm·in²	7.9667 lbm·in²	7.0237 lbm·in²	9860.7 lbm·in²	50.817 lbm·in²	1.1917 lbm·in²	0.4782 lbm·in²	
Statistics										
Nodes	1525	701	1155	1525	759	5379	1388	682	207	181
Elements	210	80	172	210	89	689	166	78	22	19
Mesh Metric	None									

Coordinate Systems

TABLE 5
Model (B4) > Coordinate Systems > Coordinate System

Object Name	Global Coordinate System
State	Fully Defined
Definition	
Type	Cartesian
Coordinate System ID	0.
Origin	

Origin X	0. in
Origin Y	0. in
Origin Z	0. in
Directional Vectors	
X Axis Data	[1. 0. 0.]
Y Axis Data	[0. 1. 0.]
Z Axis Data	[0. 0. 1.]

Connections

TABLE 6
Model (B4) > Connections

Object Name	Connections
State	Fully Defined
Auto Detection	
Generate Automatic Connection On Refresh	Yes
Transparency	
Enabled	Yes

TABLE 7
Model (B4) > Connections > Contacts

Object Name	Contacts	Contacts 2
State	Fully Defined	
Definition		
Connection Type	Contact	
Scope		
Scoping Method	Geometry Selection	
Geometry	All Bodies	
Auto Detection		
Tolerance Type	Slider	
Tolerance Slider	0.	
Tolerance Value	0.10491 in	
Use Range	No	
Face/Face	No	
Face/Edge	No	
Edge/Edge	No	
Priority	Include All	
Group By	Bodies	
Search Across	Bodies	

TABLE 8
Model (B4) > Connections > Contacts > Contact Regions

Object Name	Bonded - Base plate: 1 To Multiple	Bonded - BrgMt Bottom: 1 (2) To Multiple	Bonded - HsgPlate: 1 (2) To Multiple	Bonded - HsgPlate: 1 (2) To BearingHsgEndplate-MotorSide: 1	Bonded - BrgHousing: 1 To BearingHsgEndplate-MotorSide: 1	Bonded - BearingHsgEndplate-SealSide: 1 To BrgHousing: 1	Bonded - BearingHsgEndplate-SealSide: 1 To HsgPlate: 1	Bonded - Multiple To HsgPlate: 1	Bonded - HsgPlate: 1 To BrgMt Bottom: 1	Bonded - BrgMt Bottom: 1 To Multiple	Bonded - Multiple To Base plate: 1
-------------	------------------------------------	--	--------------------------------------	---	---	--	--	----------------------------------	---	--------------------------------------	------------------------------------

Update Stiffness	Program Controlled
Pinball Region	Program Controlled
Geometric Modification	
Contact Geometry Correction	None

TABLE 9
Model (B4) > Connections > Contacts 2 > Contact Regions

Object Name	Bonded - Multiple To Multiple	Bonded - Multiple To Multiple	Bonded - Multiple To Multiple	Bonded - PrimaryGland:1 To Multiple
State	Fully Defined			
Scope				
Scoping Method	Geometry Selection			
Contact	2 Faces			
Target	2 Faces			
Contact Bodies	Multiple			PrimaryGland:1
Target Bodies	Multiple			
Definition				
Type	Bonded			
Scope Mode	Manual			
Behavior	Program Controlled			
Trim Contact	Program Controlled			
Suppressed	No			
Advanced				
Formulation	Program Controlled			
Detection Method	Program Controlled			
Penetration Tolerance	Program Controlled			
Elastic Slip Tolerance	Program Controlled			
Normal Stiffness	Program Controlled			
Update Stiffness	Program Controlled			
Pinball Region	Program Controlled			
Geometric Modification				
Contact Geometry Correction	None			

Mesh

TABLE 10
Model (B4) > Mesh

Object Name	<i>Mesh</i>
State	Solved
Defaults	
Physics Preference	Mechanical
Relevance	0
Sizing	
Use Advanced Size Function	Off
Relevance Center	Coarse
Element Size	Default
Initial Size Seed	Active Assembly
Smoothing	Medium
Transition	Fast
Span Angle Center	Coarse
Minimum Edge Length	7.3246e-002 in
Inflation	
Use Automatic Inflation	None
Inflation Option	Smooth Transition
Transition Ratio	0.272
Maximum Layers	5
Growth Rate	1.2
Inflation Algorithm	Pre
View Advanced Options	No
Patch Conforming Options	
Triangle Surface Mesher	Program Controlled
Patch Independent Options	
Topology Checking	Yes
Advanced	
Number of CPUs for Parallel Part Meshing	Program Controlled
Shape Checking	Standard Mechanical
Element Midside Nodes	Program Controlled
Straight Sided Elements	No
Number of Retries	Default (4)
Extra Retries For Assembly	Yes
Rigid Body Behavior	Dimensionally Reduced
Mesh Morphing	Disabled
Defeaturing	
Pinch Tolerance	Please Define
Generate Pinch on Refresh	No
Automatic Mesh Based Defeaturing	On
Defeaturing Tolerance	Default
Statistics	
Nodes	142047
Elements	71869
Mesh Metric	None

Static Structural (B5)

TABLE 11
Model (B4) > Analysis

Object Name	<i>Static Structural (B5)</i>
State	Solved
Definition	
Physics Type	Structural
Analysis Type	Static Structural
Solver Target	Mechanical APDL
Options	
Environment Temperature	71.6 °F
Generate Input Only	No

TABLE 12
Model (B4) > Static Structural (B5) > Analysis Settings

Object Name	<i>Analysis Settings</i>
State	Fully Defined
Step Controls	
Number Of Steps	1.
Current Step Number	1.
Step End Time	1. s
Auto Time Stepping	Program Controlled
Solver Controls	
Solver Type	Program Controlled
Weak Springs	Program Controlled
Large Deflection	Off
Inertia Relief	Off
Restart Controls	
Generate Restart Points	Program Controlled
Retain Files After Full Solve	No
Nonlinear Controls	
Newton-Raphson Option	Program Controlled
Force Convergence	Program Controlled
Moment Convergence	Program Controlled
Displacement Convergence	Program Controlled
Rotation Convergence	Program Controlled
Line Search	Program Controlled
Stabilization	Off
Output Controls	
Stress	Yes
Strain	Yes
Nodal Forces	No
Contact Miscellaneous	No
General Miscellaneous	No
Store Results At	All Time Points
Analysis Data Management	
Solver Files Directory	C:\Users\jodavis\Documents\Ansys Analysis\1343-035\SupportStress_files\dp0\SYS\MECH\

Future Analysis	None
Scratch Solver Files Directory	
Save MAPDL db	No
Delete Unneeded Files	Yes
Nonlinear Solution	No
Solver Units	Active System
Solver Unit System	Bin

TABLE 13
Model (B4) > Static Structural (B5) > Loads

Object Name	Force	Fixed Support	Force 2
State	Fully Defined		
Scope			
Scoping Method	Geometry Selection		
Geometry	1 Face		
Definition			
Type	Force	Fixed Support	Force
Define By	Vector		Vector
Magnitude	1600. lbf (ramped)		1600. lbf (ramped)
Direction	Defined		Defined
Suppressed	No		

FIGURE 1
Model (B4) > Static Structural (B5) > Force

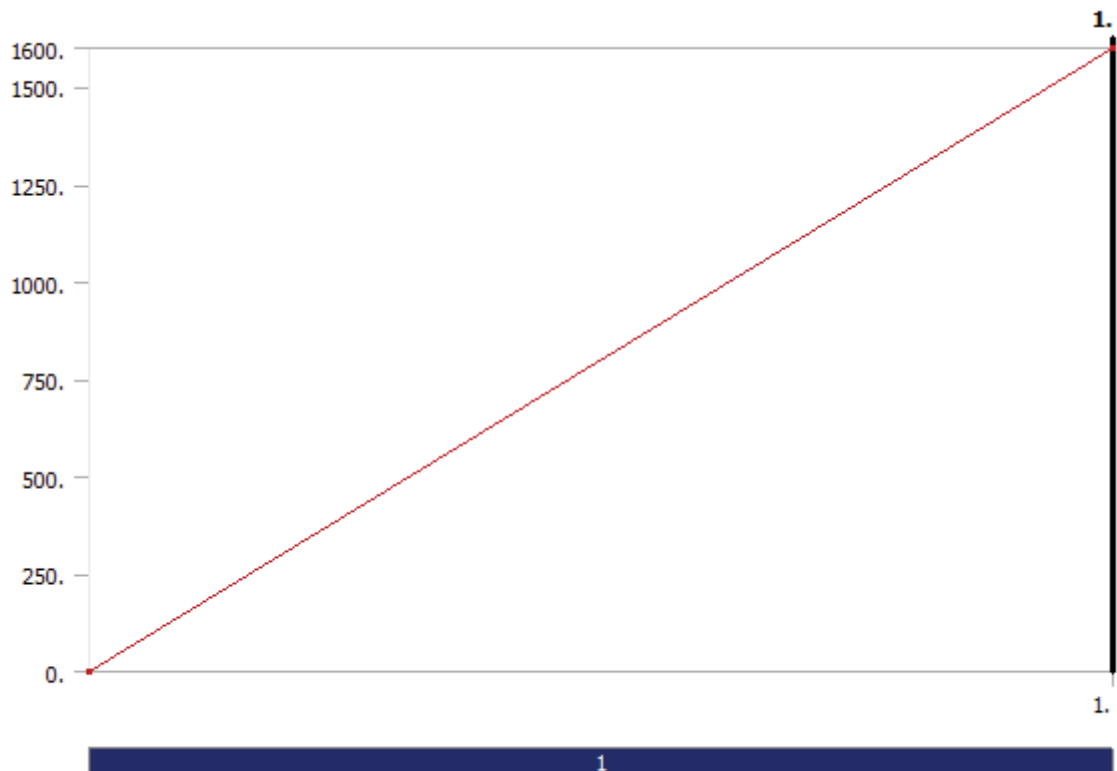


FIGURE 2
Model (B4) > Static Structural (B5) > Force > Figure
Hydraulic force acting on angular contact bearings

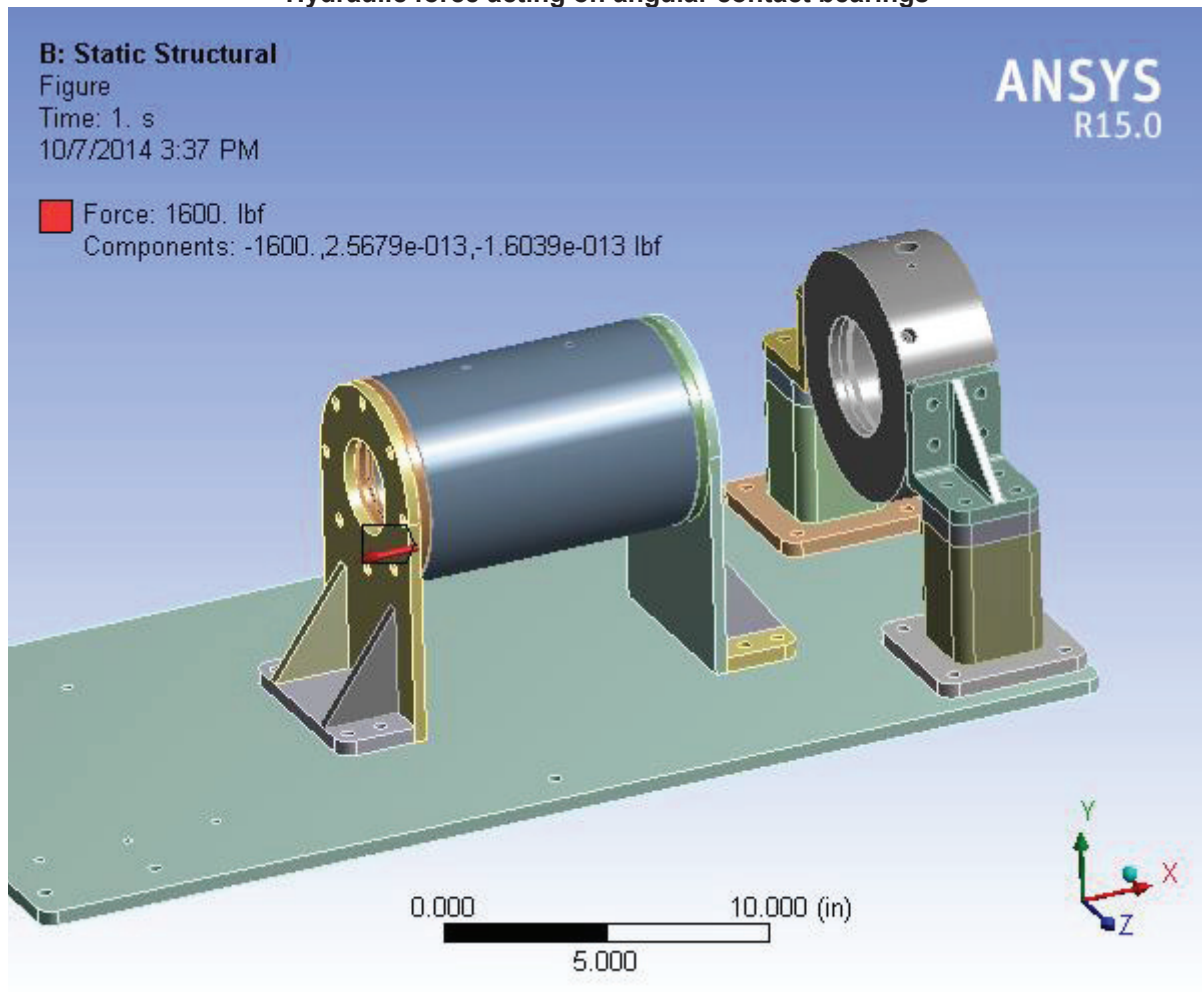
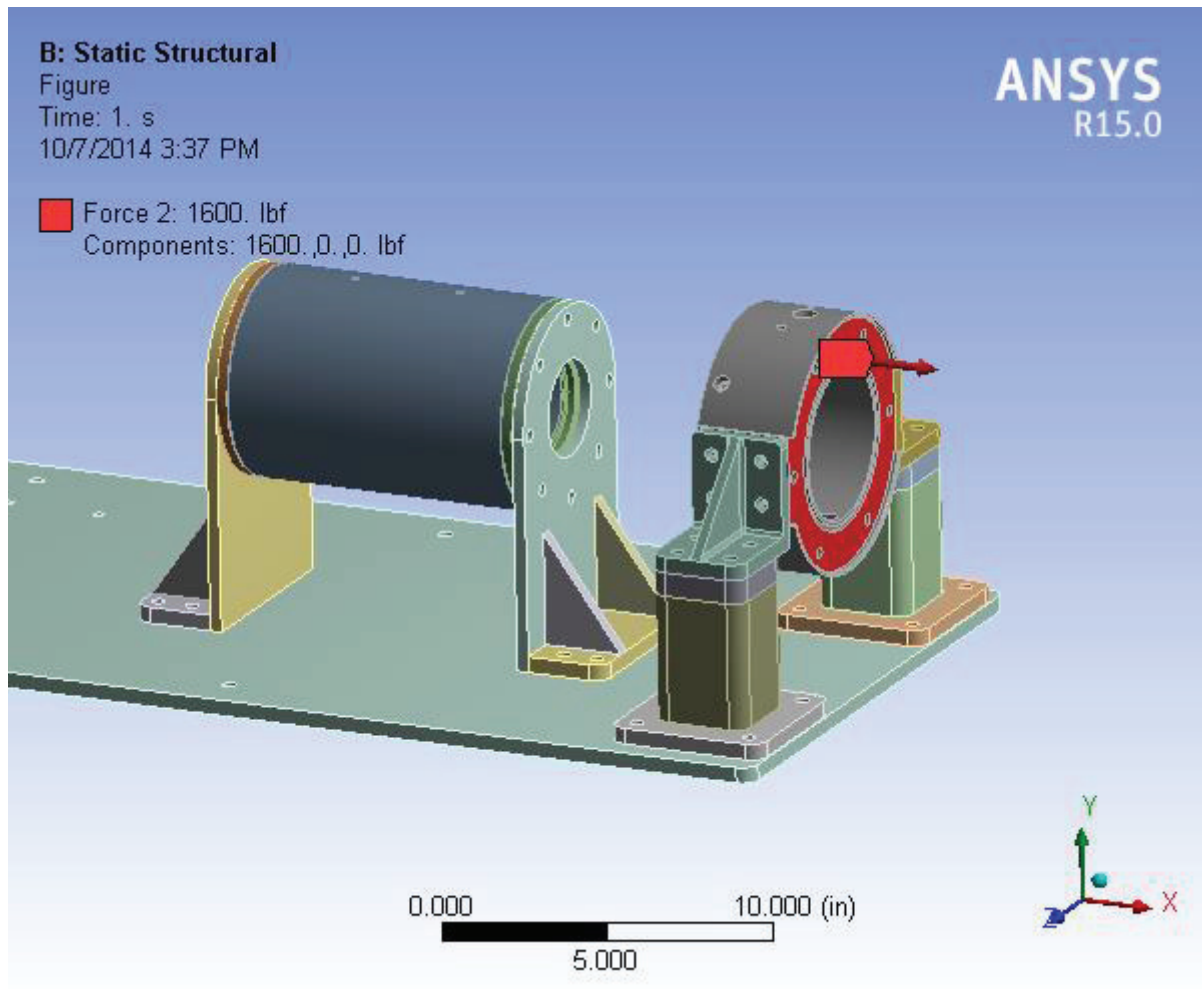


FIGURE 3
Model (B4) > Static Structural (B5) > Force 2



FIGURE 4
Model (B4) > Static Structural (B5) > Force 2 > Figure
Hydraulic force acting on front tester gland



Solution (B6)

TABLE 14
Model (B4) > Static Structural (B5) > Solution

Object Name	<i>Solution (B6)</i>
State	Solved
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.
Information	
Status	Done

TABLE 15
Model (B4) > Static Structural (B5) > Solution (B6) > Solution Information

Object Name	<i>Solution Information</i>
State	Solved
Solution Information	
Solution Output	Solver Output
Newton-Raphson Residuals	0

Update Interval	2.5 s
Display Points	All
FE Connection Visibility	
Activate Visibility	Yes
Display	All FE Connectors
Draw Connections Attached To	All Nodes
Line Color	Connection Type
Visible on Results	No
Line Thickness	Single
Display Type	Lines

TABLE 16
Model (B4) > Static Structural (B5) > Solution (B6) > Results

Object Name	Total Deformation	Equivalent Stress	Equivalent Stress 2	Directional Deformation
State	Solved			
Scope				
Scoping Method	Geometry Selection			
Geometry	All Bodies		8 Bodies	
Definition				
Type	Total Deformation	Equivalent (von-Mises) Stress		Directional Deformation
By	Time			
Display Time	Last			
Calculate Time History	Yes			
Identifier				
Suppressed	No			
Orientation				X Axis
Coordinate System				Global Coordinate System
Results				
Minimum	0. in	7.0432e-006 psi	2.3817 psi	-1.1355e-003 in
Maximum	3.3276e-003 in	11972 psi	4518.9 psi	1.2618e-004 in
Minimum Occurs On	Baseplate:1		HsgPlate:1	HsgPlate:1 (2)
Maximum Occurs On	PrimaryGland:1	BearingHsgEndplate-MotorSide:1	HsgPlate:1	HsgPlate:1 (2)
Minimum Value Over Time				
Minimum	0. in	7.0432e-006 psi	2.3817 psi	-1.1355e-003 in
Maximum	0. in	7.0432e-006 psi	2.3817 psi	-1.1355e-003 in
Maximum Value Over Time				
Minimum	3.3276e-003 in	11972 psi	4518.9 psi	1.2618e-004 in
Maximum	3.3276e-003 in	11972 psi	4518.9 psi	1.2618e-004 in
Information				
Time	1. s			
Load Step	1			
Substep	1			
Iteration Number	1			

Integration Point Results			
Display Option		Averaged	
Average Across Bodies		No	

FIGURE 5

Model (B4) > Static Structural (B5) > Solution (B6) > Total Deformation > Figure
Maximum deformation due to hydraulic load of 1600 lbs force.

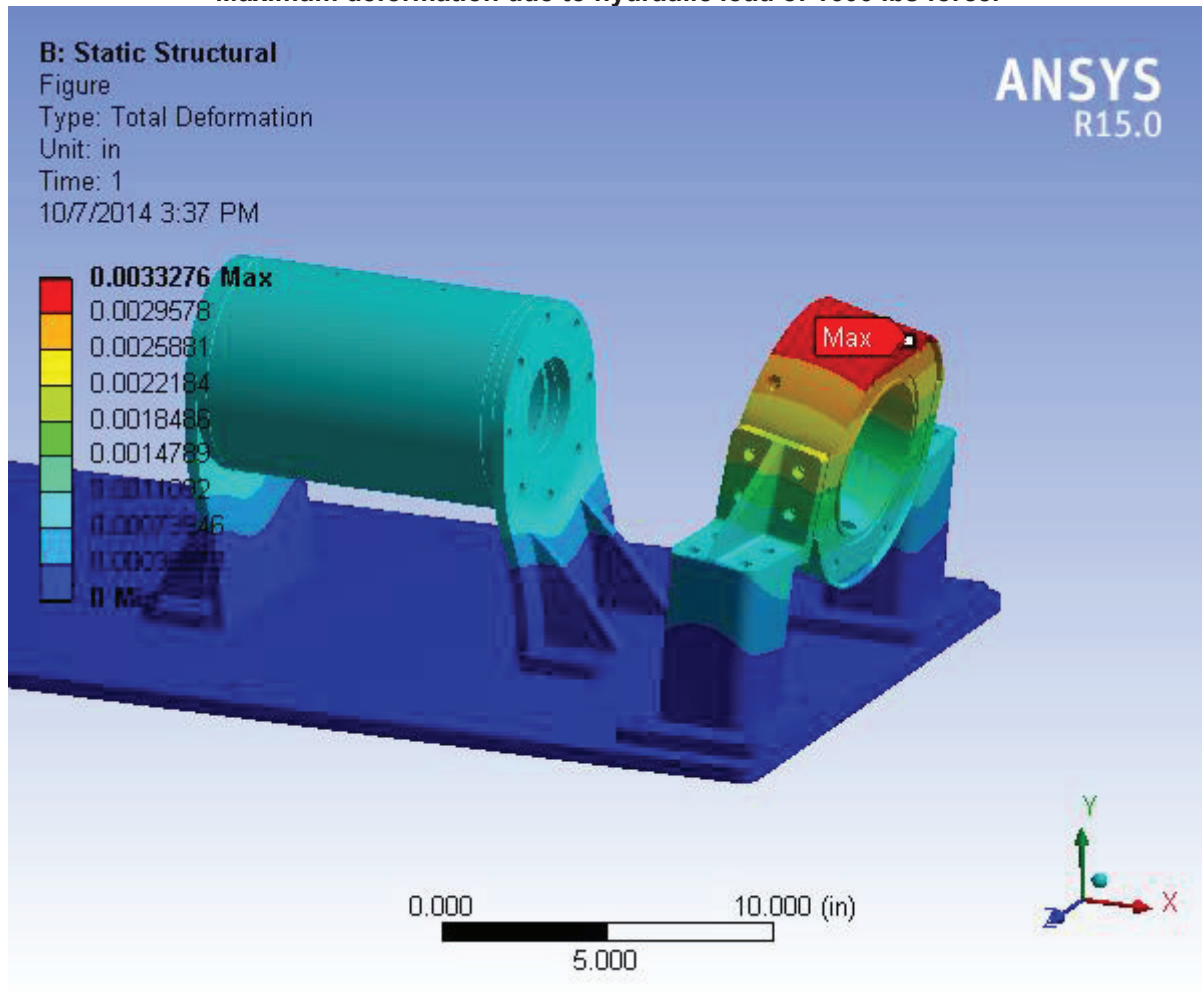


FIGURE 6

Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Stress > Figure
Von Mises stress due to 1600 lb force hydraulic load.

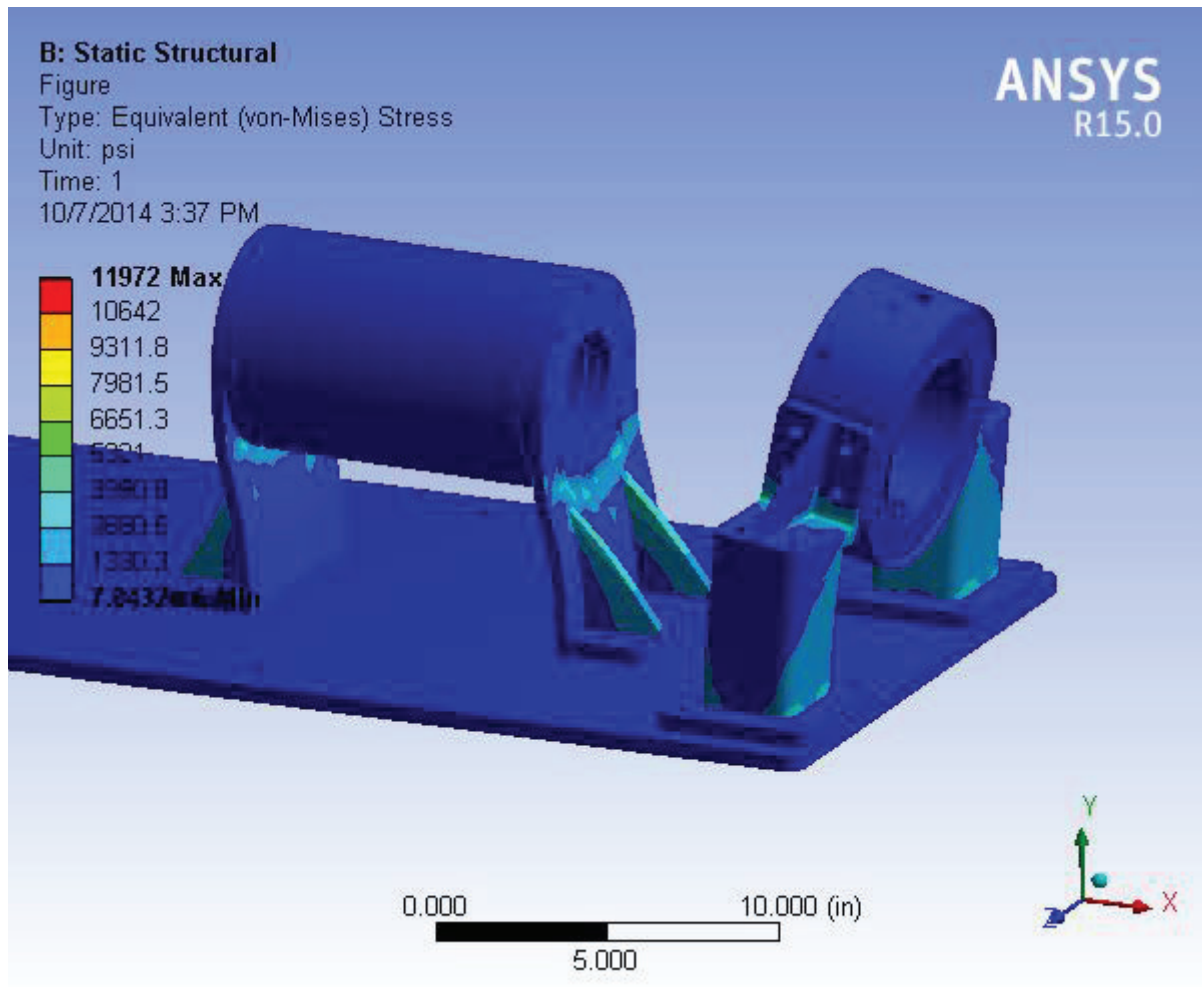


FIGURE 7
Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Stress 2 > Figure
Von Mises bearing bracket stress due to 1600 lb force hydraulic load.

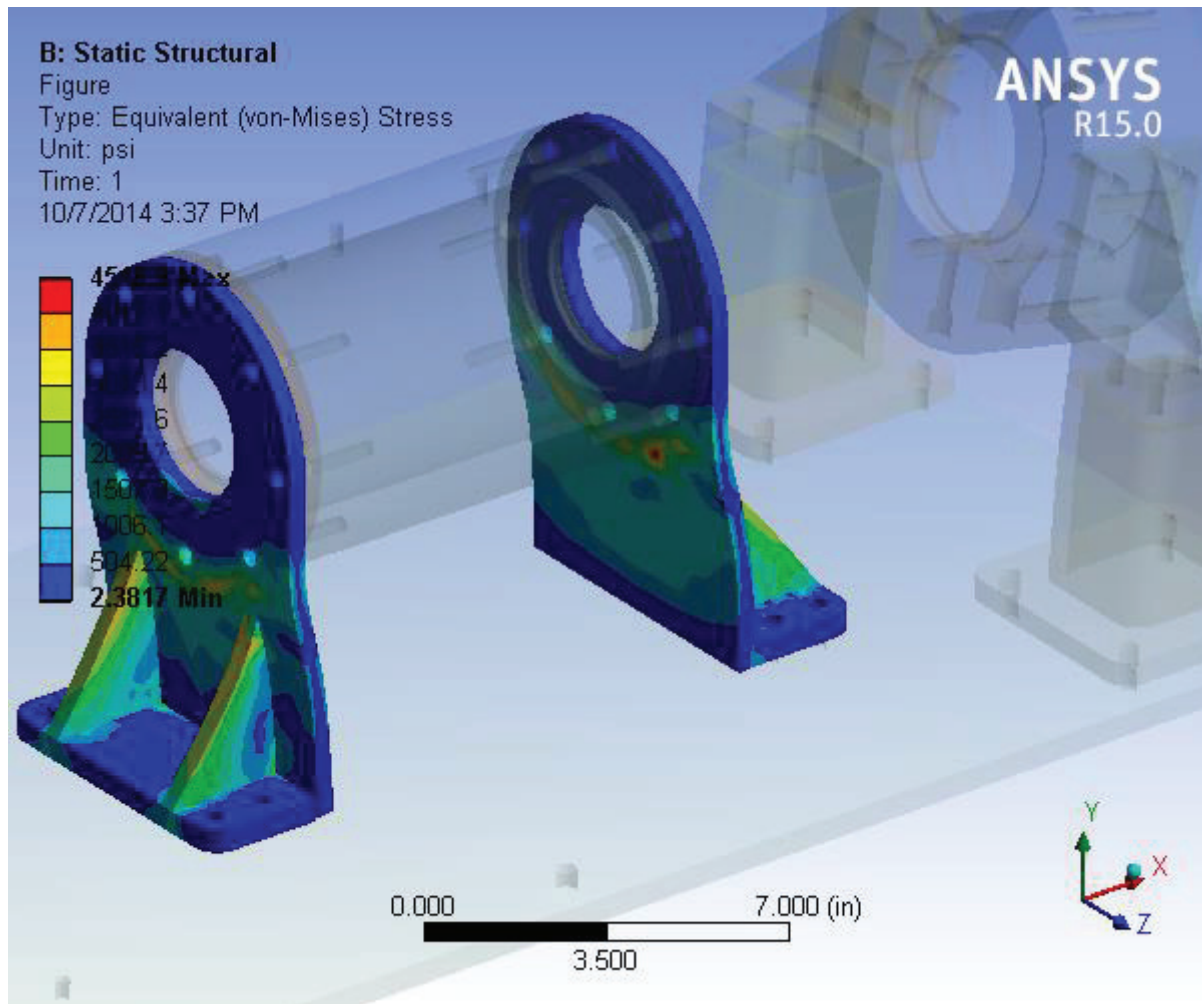
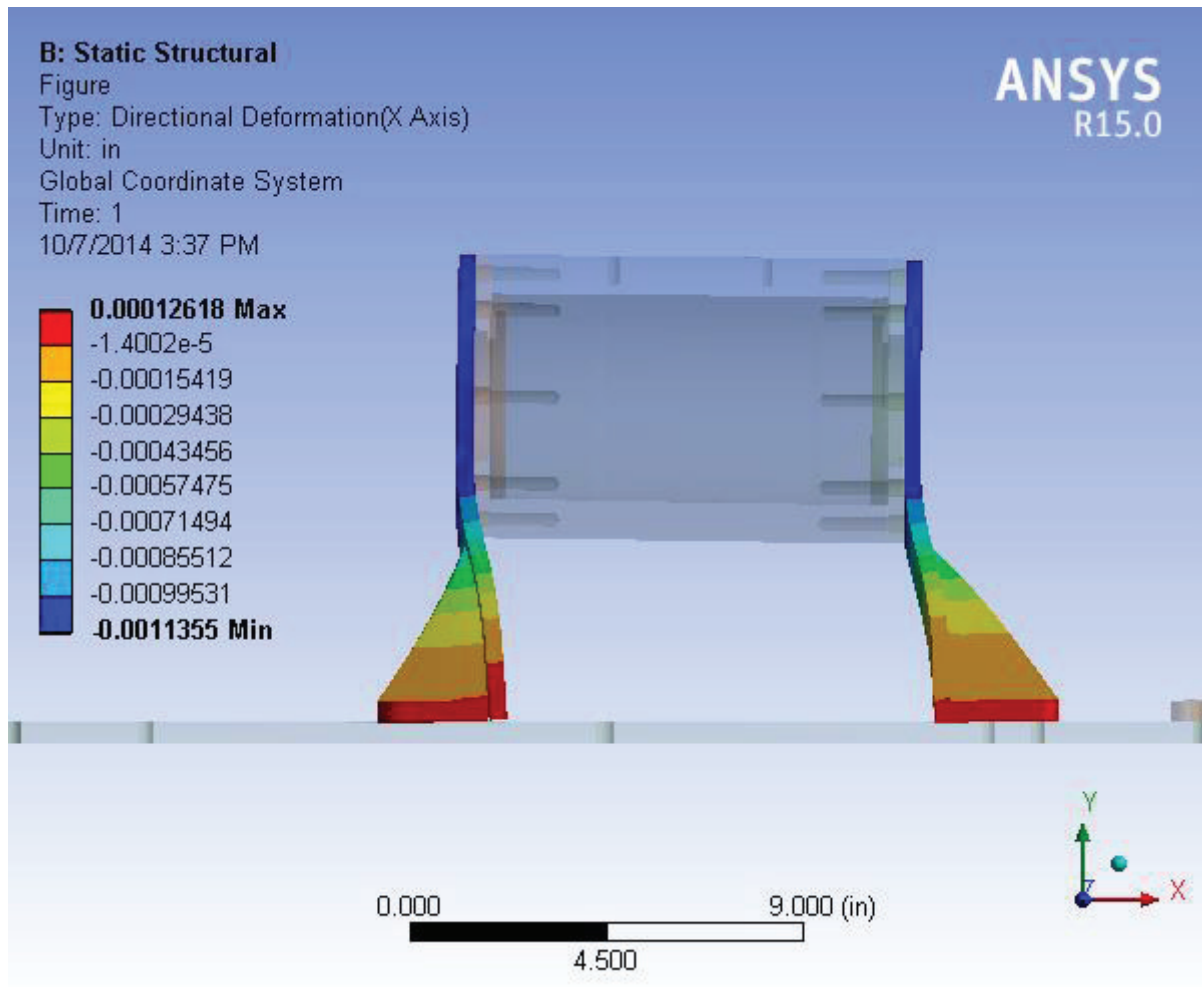


FIGURE 8
Model (B4) > Static Structural (B5) > Solution (B6) > Directional Deformation > Figure
Bearing bracket axial deformation



Material Data

Structural Steel

TABLE 17
Structural Steel > Constants

Density	0.2836 lbm in ⁻³
Coefficient of Thermal Expansion	6.6667e-006 F ⁻¹
Specific Heat	0.10366 BTU lbm ⁻¹ F ⁻¹
Thermal Conductivity	8.0917e-004 BTU s ⁻¹ in ⁻¹ F ⁻¹
Resistivity	8.5235 ohm cmil in ⁻¹

TABLE 18
Structural Steel > Compressive Ultimate Strength

Compressive Ultimate Strength psi
0

TABLE 19
Structural Steel > Compressive Yield Strength

Compressive Yield Strength psi
36259

TABLE 20
Structural Steel > Tensile Yield Strength

Tensile Yield Strength psi
36259

TABLE 21
Structural Steel > Tensile Ultimate Strength

Tensile Ultimate Strength psi
66717

TABLE 22
Structural Steel > Isotropic Secant Coefficient of Thermal Expansion

Reference Temperature F
71.6

TABLE 23
Structural Steel > Alternating Stress Mean Stress

Alternating Stress psi	Cycles	Mean Stress psi
5.8001e+005	10	0
4.1002e+005	20	0
2.7499e+005	50	0
2.0494e+005	100	0
1.5505e+005	200	0
63962	2000	0
38000	10000	0
31038	20000	0
20015	1.e+005	0
16534	2.e+005	0
12502	1.e+006	0

TABLE 24
Structural Steel > Strain-Life Parameters

Strength Coefficient psi	Strength Exponent	Ductility Coefficient	Ductility Exponent	Cyclic Strength Coefficient psi	Cyclic Strain Hardening Exponent
1.3343e+005	-0.106	0.213	-0.47	1.4504e+005	0.2

TABLE 25
Structural Steel > Isotropic Elasticity

Temperature F	Young's Modulus psi	Poisson's Ratio	Bulk Modulus psi	Shear Modulus psi
	2.9008e+007	0.3	2.4173e+007	1.1157e+007

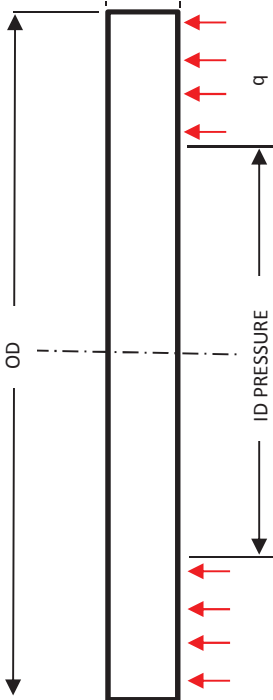
TABLE 26
Structural Steel > Isotropic Relative Permeability

Relative Permeability
10000

Appendix E3:
Pressure Vessel Final Calculations

Primary Gland Endplate Calculation

Roarks Stress/Strain Endplate Calcs (Table 11.2 Case 10a/b)

Inputs					
Project	Enter Project Number				
Description	Primary Gland				
Material	316 SS				
E	2.80E+07			Modulus (PSI)	
v	0.25			Poissons	
Syield	42100			Yield Stress (PSI)	
t	0.750			Plate Thickness (in)	
OD	8.000			Plate OD (in)	
ID of Press	3.770			ID B.C. (start) of distributed load (in)	
q	250.0	distributed load on plate (psi)			
Outputs					
For Simply Supported Outer Edge Endplate		For Fixed outer edge Endplate			
D	1050000	Plate Stiffness Constant, (lb-in)	yc	-0.0004	Max def. at center, in
yc	-0.0022	Max def. at center (in)	Mc c	88.23441	Max moment at center (in lbs /in)
Mc	390.8	Max moment at center (in lbs /in)	Mc o	-302.582	Max moment at outer edge (in lbs /in)
Stress	4168.7	Max Stress (PSI)	Stress	3227.546	Max Stress (PSI)
Safety F	10.1		Safety F	13.0	

Note: Use "For Simply Supported Outer Edge Endplate" values for reference. Calculations are based off Flowserve's official calculation sheets and cannot be edited.

Secondary Gland Endplate Calculation

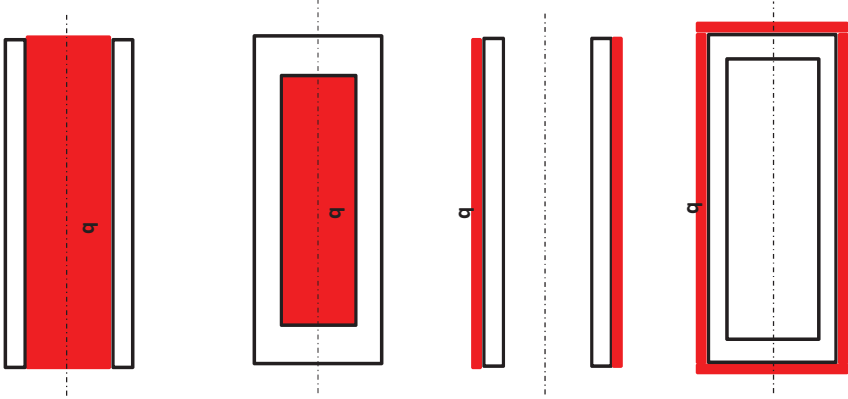
Roarks Stress/Strain Endplate Calcs (Table 11.2 Case 10a/b)

Inputs		
Project	Enter Project Number	
Description	Secondary Gland	
Material	316 SS	
E	2.80E+07	Modulus (PSI)
v	0.25	Poissons
Syield	42100	Yield Stress (PSI)
t	0.880	Plate Thickness (in)
OD	8.000	Plate OD (in)
ID of Press	5.500	ID B.C. (start) of distributed load (in)
q	250.0	distributed load on plate (psi)
Outputs		
For Simply Supported Outer Edge Endplate		For Fixed outer edge Endplate
D	1696108.089	Plate Stiffness Constant, (lb-in)
yc	-0.0006	Max def. at center (in)
Mc	160.4	Max moment at center (in lbs /in)
Stress	1242.4	Max Stress (PSI)
Safety F	33.9	
		yc
		Mc c
		Mc o
		Stress
		Safety F

Note: Use "For Simply Supported Outer Edge Endplate" values for reference. Calculations are based off Flowserve's official calculation sheets and cannot be edited.

Primary Gland Thick Walled Stress Calculation

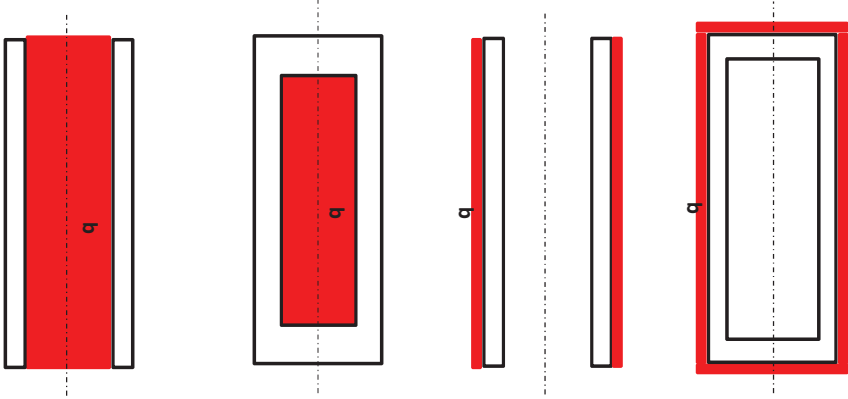
Roarks Thick Walled Cylinder Stress Calcs (Table 13.5)																		
Inputs																		
Project	Primary Gland Pressure Vessel																	
Description	316 SS																	
Mat'l	2.80E+07																	
E	0.25																	
v	8.000																	
OD	4.750																	
ID	2.250																	
Length	6.3750																	
d	250																	
Pressure, q																		
OD pressure, psi																		
Outputs																		
Uniform Internal Pressure with No Endcaps																		
Stress 1 at d	0	Longitudinal (Axial) Stress, psi																
Stress 2 at d	350	Tangential (Hoop) Stress, psi																
Stress 2 max	522	at	8.000	inch diameter. Maximum Tangential (Hoop) Stress, psi														
Stress 3 at d	-78	Radial Stress, psi																
Stress 3 max	-250	at	4.750	inch diameter. Maximum Radial Stress, psi														
tau, max	386	at	4.750	in diameter														
Final OD	8.0001																	
Final ID	4.7501																	
Final Length	2.2500																	
Uniform Internal Pressure with Closed Endcaps																		
Stress 1 at d	136.1236802	Longitudinal (Axial) Stress, psi																
Stress 2 at d	350	Tangential (Hoop) Stress, psi																
Stress 2 max	522	at	8.000	inch diameter. Maximum Tangential (Hoop) Stress, psi														
Stress 3 at d	-78	Radial Stress, psi																
Stress 3 max	-250	at	4.750	inch diameter. Maximum Radial Stress, psi														
tau, max	386	at	4.750	in diameter														
Final OD	8.0001																	
Final ID	4.7501																	
Final Length	2.2500																	
Uniform External Pressure with No Endcaps																		
Stress 1 at d	0	Longitudinal (Axial) Stress, psi																
Stress 2 at d	-600	Tangential (Hoop) Stress, psi																
Stress 2 max	-772	at	4.750	inch diameter. Maximum Tangential (Hoop) Stress, psi														
Stress 3 at d	-172	Radial Stress, psi																
Stress 3 max	-250	at	8.000	inch diameter. Maximum Radial Stress, psi														
tau, max	-386	at	4.750	in diameter														
Final OD	7.9999																	
Final ID	4.7499																	
Final Length	2.2500																	
Uniform External Pressure with Closed Endcaps																		
Stress 1 at d	-386.12368	Longitudinal (Axial) Stress, psi																
Stress 2 at d	-600	Tangential (Hoop) Stress, psi																
Stress 2 max	-772	at	4.750	inch diameter. Maximum Tangential (Hoop) Stress, psi														
Stress 3 at d	-172	Radial Stress, psi																
Stress 3 max	-250	at	8.000	inch diameter. Maximum Radial Stress, psi														
tau, max	-386	at	4.750	in diameter														
Final OD	8.0001																	
Final ID	4.7499																	
Final Length	2.2500																	



Note: Use "Uniform Internal Pressure with Closed Endcaps" values for reference. Calculations are based off Flowserve's official calculation sheets and cannot be edited.

Secondary Gland Thick Walled Calculation

Roarks Thick Walled Cylinder Stress Calcs (Table 13.5)																		
Inputs																		
Project	1343.031																	
Description	Secondary Gland Pressure Vessel																	
Mat'l	316 SS																	
E	2.80E+07																	
v	0.25																	
OD	8.000																	
ID	5.500																	
Length	3.00																	
d	6.7500																	
Pressure, q	250																	
OD pressure, psi																		
Outputs																		
Uniform Internal Pressure with No Endcaps																		
Stress 1 at d	0	Longitudinal (Axial) Stress, psi																
Stress 2 at d	539	Tangential (Hoop) Stress, psi																
Stress 2 max	698	at 8.000 inch diameter. Maximum Tangential (Hoop) Stress, psi																
Stress 3 at d	-91	Radial Stress, psi																
Stress 3 max	-250	at 5.500 inch diameter. Maximum Radial Stress, psi																
tau, max	474	at 5.500 in diameter																
Final OD	8.0001																	
Final ID	5.5001																	
Final Length	3.0000																	
Uniform Internal Pressure with Closed Endcaps																		
Stress 1 at d	224.0740741	Longitudinal (Axial) Stress, psi																
Stress 2 at d	539	Tangential (Hoop) Stress, psi																
Stress 2 max	698	at 8.000 inch diameter. Maximum Tangential (Hoop) Stress, psi																
Stress 3 at d	-91	Radial Stress, psi																
Stress 3 max	-250	at 5.500 inch diameter. Maximum Radial Stress, psi																
tau, max	474	at 5.500 in diameter																
Final OD	8.0001																	
Final ID	5.5001																	
Final Length	3.0000																	
Uniform External Pressure with No Endcaps																		
Stress 1 at d	0	Longitudinal (Axial) Stress, psi																
Stress 2 at d	-789	Tangential (Hoop) Stress, psi																
Stress 2 max	-948	at 5.500 inch diameter. Maximum Tangential (Hoop) Stress, psi																
Stress 3 at d	-159	Radial Stress, psi																
Stress 3 max	-250	at 8.000 inch diameter. Maximum Radial Stress, psi																
tau, max	474	at 5.500 in diameter																
Final OD	7.9998																	
Final ID	5.4998																	
Final Length	3.0000																	
Uniform External Pressure with Closed Endcaps																		
Stress 1 at d	-474.074074	Longitudinal (Axial) Stress, psi																
Stress 2 at d	-789	Tangential (Hoop) Stress, psi																
Stress 2 max	-948	at 5.500 inch diameter. Maximum Tangential (Hoop) Stress, psi																
Stress 3 at d	-159	Radial Stress, psi																
Stress 3 max	-250	at 8.000 inch diameter. Maximum Radial Stress, psi																
tau, max	474	at 5.500 in diameter																
Final OD	8.0001																	
Final ID	5.4998																	
Final Length	3.0000																	



Note: Use "Uniform Internal Pressure with Closed Endcaps" values for reference. Calculations are based off Flowserve's official calculation sheets and cannot be edited.

Pressure Vessel Bolt Calculation

Gland Bolt Calculations			
Description	7/16 - 14 Pressure Vessel Bolt		
Bolt Part Number	92196A675		
Hydraulic Loading Calcs			
Gland Gasket Groove OD		8	Inches
Balance Diameter		7.5	Inches
Hydraulic Pressure		250	psi
Hydraulic Load		1521.7	lbs
Additional Loads		0.0	lbs
Total Load		1521.7	lbs
Bolt Quantity Calcs			
Bolt Size	7/16-14		
Stress Area		0.1063	Inches
Allowable Stress Per Bolt		25000	psi
Minimum Number of Bolts	6		
Tensile Stress Per Bolt		2386	psi
Bolt Preload Calcs			
Number of Bolts To Be Used	6		
Bolt Grade	304 SS		
Minimum Required Tightening Torque		2	ft-lbs
Maximum Allowable Tightening Torque		14	ft-lbs

Notes

- Minimum required tightening torque is based on 10% over computed Total Load
- Maximum allowable tightening torque is based on 50% of bolt material proof strength
- Red fill in the Maximum Allowable Tightening Torque field indicates the bolt grade or quantity is insufficient
- User inputs are blue, calculated outputs are yellow

Appendix E4:
Phase II Calculations

MINIMUM THICKNESS FOR SHELL

(UG-22)

(ASME CODE P.V.)

GIVEN: $P = 200$ psi MAWP

$E = 1.00$ (SEAMLESS) & ASSUMING NO WELDING

$R = 2.125$ inch

$S = 9000$ psi (MINIMUM TENSILE STRENGTH)

PROCEDURE 2-11 : PRESSURE VESSEL DESIGN MANUAL ANALYSIS:

$$t = \frac{PR}{SE - 0.6P}$$

$$= \frac{(200)(2.125)}{(9000)(1) - (0.6(200))} = \frac{425}{8880}$$

$$t_{min} = .0479 \text{ inches}$$

WE WILL BE USING .0479 inch THICK SHELL.

ANALYZING POLYCARBONATE LEXAN SHELL FOR PRESSURE VESSEL.

GIVENS (ASME CODE UG-23)

$$\begin{aligned} D_{IN} &= 4.25 \text{ inch} \\ D_{OUT} &= 5.25 \text{ inch} \\ t &= 0.5 \text{ inch} \end{aligned}$$

$$\begin{aligned} \text{WORKING PRESSURE} &: 200 \text{ PSI MAX} \\ \text{DESIGN PRESSURE} &: 200 + 50 \text{ PSI} \\ &= 225 \text{ PSI} \end{aligned}$$

FROM: PRESSURE VESSEL DESIGN MANUAL

(TABLE 1-4) PG. 35

POLYCARBONATE LEXAN

PROPERTY	TEST METHOD	UNITS
----------	-------------	-------

$S_y = \text{YIELD}$	ASTM D638	9000 PSI
----------------------	-----------	----------

$S_u = \text{ULTIMATE}$	ASTM D638	9500 PSI
-------------------------	-----------	----------

(FROM ADVANCE GLASSER & SUPPLY)

$$TEMP = 200^\circ F \text{ (MAX WORKING)}$$

$$T_{DESIGN} = 200 + 50 = 250^\circ F$$

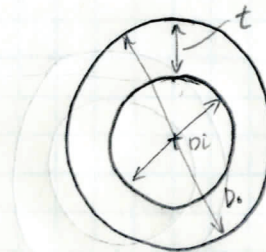
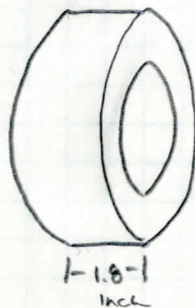
COEFFICIENT OF THERMAL EXPANSION

$$\alpha = 1.5 \times 10^{-5} \text{ in/in}^\circ F \text{ (McMASTER-CARR)}$$

ELASTIC MODULUS

$$E = 2.6 \times 10^9 \text{ Pa} \Rightarrow 377,098.12 \text{ PSI (ENGINEERING TOOLBOX)}$$

AND
SCHEMATIC :



ANALYSIS:

USING FORMULAS FROM SHIGLEY'S 9TH EDITION

THICK WALLED:

$$r = \frac{4.25}{2}$$

$$t = .5$$

$$\frac{r}{t} < 10 \Rightarrow \text{THICKWALLED}$$

$$\frac{2.125}{.5} < 10$$

$$4.25 < 10 \checkmark$$

THUS USE THICKWALLED EQNS.

HOOP STRESS

$$\sigma_t = \frac{r_i^2 p_i}{r_o^2 - r_i^2} \left(1 + \frac{r_o^2}{r^2} \right) \quad r = r_i \quad (3-50)$$

$$= \frac{(2.125)^2 (225)}{(2.625^2 - 2.125^2)} \left(1 + \frac{(2.625)^2}{(2.125)^2} \right)$$

$$\sigma_t = 427.8 (2.526)$$

$$\boxed{\sigma_t = 1080.60 \text{ psi}}$$

RADIAL STRESS

$$\sigma_r = \frac{r_i^2 p_i}{r_o^2 - r_i^2} \left(1 - \frac{r_o^2}{r^2} \right)$$

$$= \frac{(2.125)^2 (225)}{(2.625^2 - 2.125^2)} \left(1 - \frac{2.625^2}{2.125^2} \right)$$

$$\boxed{\sigma_r = -225 \text{ psi}}$$

LONGITUDINAL STRESS

$$\sigma_l = \frac{P_i r_i^2}{r_o^2 - r_i^2} \quad (3-51)$$

$$= \frac{(225)(2.125)^2}{(2.625^2 - 2.125^2)}$$

$$\boxed{\sigma_l = 427.796 \text{ psi}}$$

THERMAL STRESS

$$T_{\text{BETWEEN}} = 70^\circ\text{F TO } 250^\circ\text{F}$$

$$\sigma_{th} = -E\alpha(T_2 - T_1)$$

$$= (-377,098.12)(1.5 \times 10^{-5})(250 - 70)$$

$$\boxed{\sigma_{th} = -1018.16 \text{ psi}} \quad (\text{ONLY IN LONGITUDINAL DIR.})$$

COMBINED STRESS

USING DISTORTION ENERGY THEORY

$$\sigma_e = \frac{1}{\sqrt{2}} \left[(\sigma_t - \sigma_{th})^2 + (\sigma_{th} - \sigma_r)^2 + (\sigma_r - \sigma_t)^2 \right]^{1/2}$$

LONGITUDINAL STRESS & THERMAL STRESS

$$\sigma_{lh} = -1018.16 + 427.796 \text{ psi}$$

$$\boxed{\sigma_e = 1521.54 \text{ psi}}$$

$$n_{sy} = \frac{S_y}{\sigma_e} = \frac{9000 \text{ psi}}{1521 \text{ psi}} = \boxed{5.92}$$

NOTE: THE SAME CALCULATIONS WERE DONE FOR THE STAINLESS STEEL END CAPS SINCE THEY WERE PARTIALLY MADE INTO ENDCAPS AS WELL.

ENDURANCE LIMIT ANALYSIS FOR POLYCARBONATE LEXAN

GIVEN: $S_e = 1000 \text{ psi}$ FOR POLYCARBONATE LEXAN
@ 70°F

ASTM D671
TEST

FOR 10^7 CYCLES

$$S_y = 9000 \text{ psi}$$

$$S_e = 1521.54 \text{ psi}$$

ANALYSIS:

$$\sigma_m = \frac{\sigma_{\max} + \sigma_{\min}}{2}$$

$$\sigma_a = \left| \frac{\sigma_{\max} - \sigma_{\min}}{2} \right|$$

$$\sigma_e = \sigma_{\max}$$

$$\sigma_{\min} = 0$$

$$\sigma_m = \frac{1521.54}{2} \text{ psi} = \sigma_a$$

$$\sigma_m = \sigma_a = 760.77$$

ASME - ELLIPTIC

$$\left(\frac{n\sigma_a}{S_e} \right)^2 + \left(\frac{n\sigma_m}{S_y} \right)^2 = 1$$

$$\left(\frac{760.77n}{1000} \right)^2 + \left(\frac{760.77n}{9000} \right)^2 = 1$$

$$.578771n^2 + .007145n^2 = 1$$

$$\boxed{n = 1.306}$$

FOR 10^7 CYCLES

ENDURANCE LIMIT & CYCLIC LOADING CALCULATIONS

USING MARIEN EQUATIONS: 316 STEEL ENDCAPS

$$S_e = k_a k_b k_c k_d k_e k_f S_e'$$

$$S_e' =$$

$$S_{ut} =$$

ANALYSIS: SHIGLEY'S 9TH ED.

SURFACE FACTOR

TABLE 6-2

MACHINED

$$a = 2.70 \text{ kpsi}$$

$$b = -0.265$$

$$k_a = a S_{ut}^b$$

$$k_a = (2.70)(9.5)^{-0.265}$$

$$\underline{k_a = .24}$$

SIZE FACTOR

ASSUME AXIAL LOADING

$$k_b = .85$$

LOADING FACTOR

$$k_c = 0.85 \text{ AXIAL}$$

TEMPERATURE FACTOR

$$k_d = 0.975 + 0.432(10^{-3})T_F - 0.115(10^{-5})T_F^2 \\ + 0.104(10^{-8})T_F^3 - 0.595(10^{-12})T_F^4$$

$$T_F = 200^\circ\text{F}$$

$$k_d = 1.025$$

RELIABILITY FACTOR

$$K_e = .702 \text{ FOR } 99.99\% \text{ RELIABILITY}$$

MISC. FACTOR

STRESS CONCENTRATION

$$K_f = 1 + q(K_t - 1)$$

$$q = 0.8$$

$$K_t = 3$$

$$K_f = 1 + 0.8(3 - 1)$$

$$K_f = 2.60$$

FIG. 6-20 SHEGUEY'S 9th ED.

ASME - ELLIPTIC

$$\left(\frac{\sigma_a}{S_e}\right)^2 + \left(\frac{\sigma_m}{S_y}\right)^2 = \frac{1}{n^2}$$

$$\sigma_a = \sigma_m = \frac{\sigma_e}{2} = \frac{687.21}{2} = \underline{343.605 \text{ psi}}$$

$$n = 7.802$$

MOD - GOODMAN

$$n = 7.13$$

CYCLES

MOD - GOODMAN

$$\sigma_{rev} = \frac{\sigma_a}{1 - (\sigma_m / S_{ue})} = .17 \text{ ksi}$$

w/ K_f (STRESS CONCENTRATION)

$$\sigma_{rev} = (2.6)(.17 \text{ ksi}) = 0.444$$

REFER TO TABLE 6-2

$$a = 2.7$$

$$b = -0.265$$

$$S_{ut} = 84,100 \text{ psi}$$

$$a = \frac{(f S_{ut})^2}{S_e} = 1572.87$$

f FROM FIG. 6-18

$$b = -\frac{1}{3} \log \left(\frac{f S_{ut}}{S_e} \right) = -0.44$$

$$N = \left(\frac{k_f \sigma_{rev}}{a} \right)^{1/b}$$

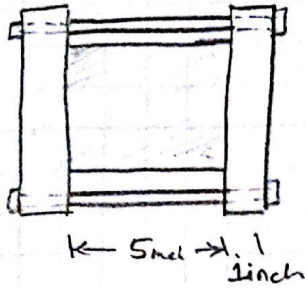
$$k_f(\sigma_{rev}) = 0.444328 k_a$$

$$N = 8.84 \times 10^9 \text{ CYCLES}$$

BOLT CALCULATION

BOLT CALCULATIONS FOR PRESSURE VESSEL

FBD:



GIVEN: $D = 6.5 \text{ inches}$

PRESSURE 200 psi MWAP



$$\sigma = \frac{F}{A}$$

$$A = \pi r^2$$

$$= \pi \left(\frac{6.5}{2} \right)^2$$

$$A = 33.18 \text{ in}^2$$

$$F = 200 \frac{\text{lb}}{\text{in}^2} (33.18 \text{ in}^2)$$

$$F = 6,636.614 \text{ lbf} \quad \boxed{\text{TOTAL FORCE}}$$

ASSUME 6 BOLTS

THUS $F = \frac{6,636.614 \text{ lbf}}{6 \text{ BOLTS}}$

$$F_{\text{PER BOLT}} = 1106.102 \text{ lbf}$$

TABLE 8-9 SHIGLEY'S

GRADE 5 SAE

SIZE RANGE $\frac{1}{4} - 1$

PROOF STRENGTH	TENSILE STRENGTH	MINIMUM YIELD
74	105	81

$$S_y = 81 \text{ kpsi} = \sigma$$

NEED MIN. SAFETY FACTOR OF 4.

$$\frac{92,000}{4} = \frac{1106.102 \text{ lbf}}{\pi(r^2)}$$

$$\pi(r^2) = \frac{1106.102}{23,000}$$

$$r = .1237 \text{ inch}$$

$$d = .24745 \text{ inch}$$

$$\text{MIN BOLT SIZE} = \boxed{\frac{1}{4} \text{ INCH BOLT}}$$

NOTE:

- CALCULATIONS MAY CHANGE FOR BOLT SIZING
- WILL BE DONE IN EXCEL

Frame Calculations

The total weight acting on the frame consists of the motor supplied by Flowserve, shaft, all torque measurement components, two bearings, and the pressure vessel. The motor supplied by Flowserve weighs 150 lbs., which is included in the final weight along with all of the weights presented in the following tables below. Also added to this for the total weight is the weight of the torque measurement system, along with the digital telemetry collar.

Table Plate					
width (in)	length (in)	thickness (in)	weight density (lb/ft ³)	weight density (lb/in ³)	total weight (lbs)
36	46	0.25	505	0.292	120.990

Pressure Vessel									
Steel End pieces			Lexane			Water		System Total	
volume (in ³)	Weight Density (lbs/in ³)	Weight (lbs)	volume (in ³)	Weight Density (lbs/in ³)	Weight (lbs)	volume (in ³)	Weight Density (lbs/in ³)	Weight (lbs)	Weight (lbs)
73.6	0.29	21.344	46.97	0.043	2.020	76.969	0.036	2.775	26.139

Shaft: 1018 Steel				
Area (in ²)	Length (in)	volume (in ³)	Weight Density (lbs/in ³)	Weight (lbs)
1.610	25	40.252	0.283	11.391

Bearings			
volume (in ³)	Weight Density (lbs/in ³)	Quantity	Weight (lbs)
5.95	0.29	2	3.451

The total weight totals to approximately 320 lbs. The exact weight will be used in later calculations for structural member deflection.

To verify the structural integrity of the frame, to protect those operating the machine and to ensure an accurate measurement, several calculations are needed. Below is a calculation of the load required to cause the vertical support of the frame to buckle using Euler's Formula for Column Buckling. The supports used are 2"x2"x1/4" steel square tubing with a modulus of elasticity of 29×10^6 psi. The moment of inertia is calculated below as well, as well as an explanation of this result.

$$P_{CR} = \frac{\pi^2 \times E \times I}{L^2}$$

$$I = \frac{1}{12}bh^3$$

$$I = \frac{1}{12((2in)(2in)^3 - (1.5in)(1.5in)^3)}$$

$$I = 0.91145in^4$$

$$P_{CR} = \frac{\pi^2 \times (29 \times 10^6psi) \times (0.91145in^4)}{(32.5in)^2}$$

$$P_{CR} = 246,983 \text{ lbs.}$$

According to this analysis, the load required to cause a vertical support to buckle would be approximately 250,000 lbs. This system will not be seeing loads exceeding 500 lbs. Therefore, there is no possibility of the vertical supports buckling under the system load.

Shaft deflection can lead to an inaccurate torque measurement on the shaft. An analysis of the loads acting on the structural members is modeled by a simple beam, using the beam deflection equation used in Shigley's Mechanical Design textbook. There were three members chosen for analysis, a sample calculation of one member is seen below, as well as a table of results following. An explanation of these results will follow.

$$y_{max} = -\frac{5 \times \omega \times L^4}{384 \times E \times I}$$

A short explanation of some variables is needed. The term ω is defined as the distributed weight per in across the member. This value references the total weight on top of the frame in Table 10, and divides that total weight by L for a value in lbs. per inch. The L term is the length in inches of the member between two vertical supports. The modulus of elasticity as well as the moment of inertia is the same as the previous calculation. The following is a sample calculation analyzing one member, along with tables summarizing this calculation for the other two members in question.

$$y_{max} = -\frac{5 \times \frac{10.713lbs}{in} \times (30in)^4}{384 \times (29 \times 10^6psi) \times 0.91145in^4}$$

$$y_{max} = -0.00427 \text{ in}$$

Segment 1					
Weight (lbs)	Length (in)	Distributed Weight (lbs/in)	I (in ⁴)	E (x10 ⁶ psi)	y _{max} (in)
321.411	30	10.714	0.912	29	-0.00427

Segment 2					
Weight (lbs)	Length (in)	Distributed Weight (lbs/in)	I (in ⁴)	E (x10 ⁶ psi)	y _{max} (in)
321.411	19	16.916	0.912	29	-0.00109

Segment 3					
Weight (lbs)	Length (in)	Distributed Weight (lbs/in)	I (in ⁴)	E (x10 ⁶ psi)	y _{max} (in)
321.411	12	26.784	0.912	29	-0.00027

As noted before, the weight distribution is the total weight divided by the length of the member to give an equal distribution across the member. These deflection calculations were carried out with the safety assumption that all the weight would be carried by one member at any time during operation. This assumption is not realistic because of the steel table top that will distribute the weight evenly across the top of the frame. However, it was necessary to carry out these calculations as seen above in order to account for a worst case scenario to prevent shaft deflection in order to protect the integrity of the torque measurement.

Motor	
Max Speed [RPM]	3600
Min Speed [RPM]	1000
Power [hp]	10

[illegible][illegible]

Source Data	Symbol	Unit
Length	h	cm
Width	b	cm
Thickness	c	cm
Area	A	cm ²
Volume	V	cm ³
Mass	m	g
Density	ρ	g/cm ³
Force	F	N
Pressure	p	N/m ²
Stress	σ	N/m ²
Strain	ϵ	-
Displacement	δ	cm
Deflection	Δ	cm
Angle	θ	rad
Frequency	f	Hz
Period	T	s
Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Wave Number	k	m ⁻¹
Wave Wave Velocity	v	m/s
Wave Wave Acceleration	a	m/s ²
Wave Wave Amplitude	A	m
Wave Wave Phase	ϕ	rad
Wave Wave Frequency	f	Hz
Wave Wave Period	T	s
Wave Wave Wavelength	λ	m
Wave Wave Wave Number	k	m ⁻¹
Wave Wave Wave Velocity	v	m/s
Wave Wave Wave Acceleration	a	m/s ²
Wave Wave Wave Amplitude	A	m
Wave Wave Wave Phase	ϕ	rad
Wave Wave Wave Frequency	f	Hz
Wave Wave Wave Period	T	s
Wave Wave Wave Wavelength	λ	m
Wave Wave Wave Wave Number	k	m ⁻¹
Wave Wave Wave Wave Velocity	v	m/s
Wave Wave Wave Wave Acceleration	a	m/s ²
Wave Wave Wave Wave Amplitude	A	m
Wave Wave Wave Wave Phase	ϕ	rad
Wave Wave Wave Wave Frequency	f	Hz
Wave Wave Wave Wave Period	T	s
Wave Wave Wave Wave Wavelength	λ	m
Wave Wave Wave Wave Wave Number	k	m ⁻¹
Wave Wave Wave Wave Wave Velocity	v	m/s
Wave Wave Wave Wave Wave Acceleration	a	m/s ²
Wave Wave Wave Wave Wave Amplitude	A	m
Wave Wave Wave Wave Wave Phase	ϕ	rad
Wave Wave Wave Wave Wave Frequency	f	Hz
Wave Wave Wave Wave Wave Period	T	s
Wave Wave Wave Wave Wave Wavelength	λ	m
Wave Wave Wave Wave Wave Wave Number	k	m ⁻¹
Wave Wave Wave Wave Wave Wave Velocity	v	m/s
Wave Wave Wave Wave Wave Wave Acceleration	a	m/s ²
Wave Wave Wave Wave Wave Wave Amplitude	A	m
Wave Wave Wave Wave Wave Wave Phase	ϕ	rad
Wave Wave Wave Wave Wave Wave Frequency	f	Hz
Wave Wave Wave Wave Wave Wave Period	T	s
Wave Wave Wave Wave Wave Wave Wavelength	λ	m
Wave Wave Wave Wave Wave Wave Wave Number	k	m ⁻¹
Wave Wave Wave Wave Wave Wave Wave Velocity	v	m/s
Wave Wave Wave Wave Wave Wave Wave Acceleration	a	m/s ²
Wave Wave Wave Wave Wave Wave Wave Amplitude	A	m
Wave Wave Wave Wave Wave Wave Wave Phase	ϕ	rad
Wave Wave Wave Wave Wave Wave Wave Frequency	f	Hz
Wave Wave Wave Wave Wave Wave Wave Period	T	s
Wave Wave Wave Wave Wave Wave Wave Wavelength	λ	m
Wave Wave Wave Wave Wave Wave Wave Wave Number	k	m ⁻¹
Wave Wave Wave Wave Wave Wave Wave Wave Velocity	v	m/s
Wave Wave Wave Wave Wave Wave Wave Wave Acceleration	a	m/s ²
Wave Wave Wave Wave Wave Wave Wave Wave Amplitude	A	m
Wave Wave Wave Wave Wave Wave Wave Wave Phase	ϕ	rad
Wave Wave Wave Wave Wave Wave Wave Wave Frequency	f	Hz
Wave Wave Wave Wave Wave Wave Wave Wave Period	T	s
Wave Wave Wave Wave Wave Wave Wave Wave Wavelength	λ	m
Wave Wave Wave Wave Wave Wave Wave Wave Wave Number	k	m ⁻¹
Wave Wave Wave Wave Wave Wave Wave Wave Wave Velocity	v	m/s
Wave Wave Wave Wave Wave Wave Wave Wave Wave Acceleration	a	m/s ²
Wave Wave Wave Wave Wave Wave Wave Wave Wave Amplitude	A	m
Wave Wave Wave Wave Wave Wave Wave Wave Wave Phase	ϕ	rad
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Wave Wave Wave Wave Wave Wave Wave Wave Wave Wavelength	λ	m
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Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Velocity	v	m/s
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Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Velocity	v	m/s
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Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wavelength	λ	m
Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Number	k	m ⁻¹
Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Velocity	v	m/s
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Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Velocity	v	m/s
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Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Velocity	v	m/s
Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Acceleration	a	m/s ²
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Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
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Wave Frequency	f	Hz
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Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Acceleration	a	m/s ²
Wave Amplitude	A	m
Wave Phase	ϕ	rad
Wave Frequency	f	Hz
Wave Period	T	s
Wave Wavelength	λ	m
Wave Number	k	m ⁻¹
Wave Velocity	v	m/s
Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave Wave		

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Parameter	Unit	Value
Normal bolt D [6]	mm	19
Bolt length [6]	mm	1
Head height [6]	mm	12
Head width [6]	mm	0.192
Number of bolts	-	8
Head area [6]	mm ²	0.0351
Tensile Stress Area [6] [22]	mm ²	0.0214
D ₀ = 6. Diameter [6]	mm	1.75
D ₁ = Bolt Hole Diameter	mm	0.209
D ₂ = Bolt Area [6] [22]	mm ²	0.00439
Recommended torque [6] [18]	Nm	22.8
Washers		
Washer OD [6]	mm	24.25
Washer ID [6]	mm	0.3325
Washer thickness [6]	mm	0.01
Washer Area	mm ²	0.0001
Washer	mm ²	0.23475
Washer	mm ²	0.3325
Washer	mm ²	0.01

Shaft/Hub Dimensions	Symbol
Fit Class on Hub	H8/f7
Nominal Diameter	d_h
Hub deviation	0.0018
Upper deviation	-0.0012
Lower deviation	-0.0024
Minimum Diameter	D_{\min}
Maximum Diameter	D_{\max}
Minimum Diameter	$d_{h\min}$
Maximum Diameter	$d_{h\max}$

0.292307692
1.266666667

Run	Weight of Section, W [lb]	Moment of Inertia, I [in ⁴]	Polar Moment of Inertia, J [in ⁴]	Deflection, y, [in]	W _y [lb/in]	W _x [lb/in]
145132627	WA	0.401912654	4.20841322	8.49598464	1.082E-05	4.402E-11
73851981	WA	2.205230924	1.60971092	3.33973919	-1.517E-07	4.010E-11
745216346	WB	2.205230924	1.60971092	3.33973919	-2.928E-07	4.010E-11
735216645	WC	2.052599718	1.5	30.0510927	-2.7268E-08	5.161E-08
1343111572	WD	0.10272413	2.3502125	2.72787819	2.393E-05	2.610E-05
6402781226	WE	1.481921243	1.60971092	3.33973919	3.6828E-06	2.610E-05
30337719128	WF	3.73639275	2.3502125	3.33973919	2.4888E-07	5.162E-08
30337719128	WF	3.73639275	2.3502125	3.33973919	7.4157E-09	9.9726E-09
30337719128	WF	3.73639275	2.3502125	3.33973919	9.7209E-09	1.056E-08

Polar Moment of Inertia in^4

Flywheel Effect [lb-in ²]	WR ²	18.42038711			
Operating Torque [in-lb]	T _{min}	175.0694441	Reaction [in-lb]	T _{max}	35.000
	T _{min}	630.25	Reaction [in-lb]	T _{mean}	50.000

	T_{spin}	35,000
	$T_{\text{R,spin}}$	50,000

Soil Stressors	Actual	Allowables - N	Factor of Safety	Allowables - Peak	Factor of Safety
Shrink	266.1841064				

	Minimum	Maximum	Allowables - Normal	Factor of Safety	Allowables - Peak	Factor of Safety
	1.24E+03	4.48E+03	1.29E+04	1.0E+01	2.30E+04	5.13E+00
	2.49E+03	8.96E+03	3.25E+04	1.31E+01	6.50E+04	7.25E+00

Ball Analysis		Factor of Safety	
Coefficient of Friction - Force		Factor of Safety	
μ	0.17822488	Minimum	6.21+08
Coefficient of Friction - Threads		Factor of Safety	
μ_t	0.2	Maximum	1.97E+01
Friction Radius [in]		Factor of Safety	
R_f	20.125	Minimum	1.48E+01
Total Clamp Load [lb]		Factor of Safety	
F_{cl}	4800	Maximum	-
Stresses		Factor of Safety	
S_s	600 Shear [psi]	Minimum	-
T_s	4000 Tensile [psi]	Maximum	-
Drilling Force		Factor of Safety	
F_{drill}	25.00992053	Minimum	-
$F_{tension}$	90.03571429	Maximum	-

Steel Reinforced Concrete Slab (R1)									
Critical Factors									
1.a	0.42	Minimum Axial Force	0	Minimum Axial Stress	0	Combined Stress	0	Amplitude Component	1021.66146
1.b	0.78	Minimum Axial Force	4000	Minimum Axial Stress	28.037453	Dead Weight Component	28.037453	Dead Weight Component	1021.66146
1.c	0.78	Minimum Axial Force	0	Minimum Axial Stress	0	Mid-range Component	0	Mid-range Component	1021.66146
1.d	1.00	Max Bending Moment	0	Maximum Bending Stress	0	Mid-range Component	0	Mid-range Component	1021.66146
1.e	0.70	Minimum Torque	175.094444	Minimum Shear	65.4603902	Amplitude Component	65.4603902	Amplitude Component	1.3361402
1.f	0.85	Minimum Torque	0	Minimum Shear	0	Amplitude Component	0	Amplitude Component	1.3361402
1.g	0.85	Minimum Torque	0	Minimum Shear	63.975	Mid-range Component	28.0374185	Mid-range Component	1927.27247
1.h	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.i	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.j	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.k	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.l	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.m	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.n	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.o	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.p	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.q	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.r	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.s	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.t	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.u	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.v	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.w	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.x	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.y	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.z	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.aa	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ab	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ac	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ad	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ae	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.af	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ag	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ah	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ai	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.aj	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ak	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.al	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.am	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.an	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ao	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ap	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.aq	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.ar	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.as	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.at	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.27247
1.au	0.85	Minimum Torque	0	Minimum Shear	0	Mid-range Component	0	Mid-range Component	1927.2

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	K _c	K _s	E _{max}	F _{max}	Maximum Shear Force	Maximum Shear	Combined Mean Stress	Significance
Stress Concentration								
Stress Conc. Shear	2.2							487.908532
Number Constant	0.027							1.02E-160
North Sensitivity	0.660							9.09E-160
Stress Conc. Factor	1.796							3.51E-2724
Number Constant - shear	0.054							
n th Order								
Number Constant - shear								
North Sensitivity - Shear								
Stress Conc. Factor - Shear								

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Stress State (at Failure Point or Case)									
Calculated Results									
Surface Condition	Factor	Stress	Stress [psi]		Combined Stress [psi]		Significance		
1	1.00	Minimum Axial Force	F _{ax}	500	Minimum Axial Stress	4152.84E+01	Amplitude Component	Significant	3.38E-03
2	1.00	Maximum Axial Force	F _{ax}	500	Maximum Axial Stress	4152.84E+01	Amplitude Component	Significant	3.38E-03
3	1.00	Minimum Bending Moment, Z	M _z	15.43712009	Minimum Bending Stress	20584.32099	Mean Range Component	Significant	3.38E-03
4	1.00	Maximum Bending Moment, Z	M _z	15.43712009	Maximum Bending Stress	20584.32099	Mean Range Component	Significant	3.38E-03
5	1.00	Minimum Bending Moment, Y	M _y	56.27232143	Minimum Bending Stress	31147.400	Mid-range Component	Significant	3.38E-03
6	1.00	Maximum Bending Moment, Y	M _y	56.27232143	Maximum Bending Stress	31147.400	Mid-range Component	Significant	3.38E-03
7	0.70	Minimum Torque	T _{xy}	6.565104467	Minimum Shear	4533.15251	Mid-range Component	Significant	3.38E-03
8	0.70	Maximum Torque	T _{xy}	6.565104467	Maximum Shear	4533.15251	Mid-range Component	Significant	3.38E-03
9	0.85	Minimum Shear Force	F _{shear}	25.09925063	Minimum Shear	25.09925063	Combined Alternating Stress	Significant	3.38E-03
10	0.85	Maximum Shear Force	F _{shear}	25.09925063	Maximum Shear	25.09925063	Combined Alternating Stress	Significant	3.38E-03
11	0.85	Minimum Shear Force	F _{shear}	9.324571425	Minimum Shear	9.324571425	Endurance Stress [psi]	Significant	2.09E-05
12	0.85	Maximum Shear Force	F _{shear}	9.324571425	Maximum Shear	9.324571425	Endurance Stress [psi]	Significant	2.09E-05
13	0.26	Number Constant	N _c	1	Steady State (Max Stress Theory)		Ultimate Strength [psi]	Significant	4.50E-04
14	0.000	Notch Sensitivity	q	1	Significant		U.S. Fatigue	Significant	3.78E-007E-02
15	1.000	Stress Conc. Factor	K _t	1	Significant		U.S. Yield	Significant	3.38E-03
16	0.100	Number Constant - Shear	N _c	1	Significant		U.S. Fatigue	Significant	3.78E-007E-02
17	0.100	Stress Conc. Factor - Shear	K _t	1	Significant		U.S. Yield	Significant	3.38E-03

Minimum Torque	T_{min}	Minimum Shear	273.8206772
Maximum Torque	T_{max}	Maximum Shear	10912.040515
			2894.441897
Minimum Shear Force	F_{min}	Minimum Shear	1043.126349
Maximum Shear Force	F_{max}	Maximum Shear	41569.698616
			11026.44532
			276.6913499
			72.63147936

Appendix F:
Gantt Chart

ID	Task Mode	Task Name	Duration Start	Finish	270 days	<div> <div>September 21</div> <div>January 1</div> <div>April 11</div> <div>July 21</div> <div>November 1</div> <div>Februa</div> </div> <div> <div>8/25</div> <div>12/1</div> <div>3/9</div> <div>6/15</div> <div>9/21</div> <div>11/9</div> <div>12/28</div> <div>2/15</div> </div>
1		Mechanical Seal and Torque Test System for Flowserve	Tue 1/14/14	Mon 1/26/15		
2		Project Proposal	10 days	Tue 1/21/14	Mon 2/3/14	
3		Problem Statement	3 days	Tue 1/14/14	Thu 1/16/14	
4		Customer Requirements	5 days	Fri 1/17/14	Thu 1/23/14	
5		Background Research	7 days	Wed 1/22/14	Thu 1/30/14	
6		Objectives	4 days	Mon 1/27/14	Thu 1/30/14	
7		QFD	4 days	Mon 1/27/14	Thu 1/30/14	
8		Overall goals	3 days	Tue 1/28/14	Thu 1/30/14	
9		Management Plan	3 days	Fri 1/24/14	Tue 1/28/14	
10		Appendices	9 days	Mon 1/20/14	Thu 1/30/14	
11		Review and Submit Project Proposal to Flowserve	2 days	Fri 1/31/14	Mon 2/3/14	
12		Preliminary Design Report and Presentation	27 days	Tue 2/4/14	Thu 3/13/14	
13		Ideation	5 days	Tue 2/4/14	Mon 2/10/14	
<div>Project: Flowserve Senior Project</div> <div>Date: Sun 1/25/15</div>						<div> <div>External Tasks</div> <div>External Milestone</div> <div>Deadline</div> <div>Progress</div> <div>Manual Progress</div> </div> <div> <div>Inactive Summary</div> <div>Manual Task</div> <div>Duration-only</div> <div>Manual Summary Rollup</div> <div>Manual Summary</div> <div>Start-only</div> <div>Finish-only</div> </div> <div> <div>Task</div> <div>Split</div> <div>Milestone</div> <div>Summary</div> <div>Project Summary</div> <div>Inactive Task</div> <div>Inactive Milestone</div> </div>

ID	Task Mode	Task Name	Duration	Start	Finish								
26		Preliminary Design Presentation with Sponsor	0 hrs	Thu 3/13/14	Thu 3/13/14								
27		Final Design Report and Presenation	91 days	Sat 3/8/14	Fri 7/11/14								
28		Design Analysis Plan	3 days	Thu 3/6/14	Mon 3/10/14								
29		Design FMEA & DVP and Design Analysis	30 days	Tue 3/11/14	Mon 4/21/14								
30		Design and Model of System	22 days	Tue 4/1/14	Wed 4/30/14								
31		CAD Model	20 days	Tue 4/1/14	Mon 4/28/14								
32		Bill of Materials	2 days	Tue 4/29/14	Wed 4/30/14								
33		Critical Design Report	0 days	Fri 5/2/14	Fri 5/2/14								
34		Critical Design Review Presentation (Class)	0 hrs	Thu 5/1/14	Thu 5/1/14								
35		Sponsor CDR	8 hrs	Mon 5/12/14	Mon 5/12/14								
36		Redesign Review	10 days	Mon 6/30/14	Fri 7/11/14								
37		Manufacturing and Testing	122 days	Fri 8/1/14	Mon 1/19/15								
38		Order Parts	6 days	Tue 5/13/14	Tue 5/20/14								
<div><div>Task</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>Task</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>Task</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div> <div><div>Project: Flowserve Senior Project</div><div>Date: Sun 1/25/15</div></div> <div><div>External Tasks</div><div>External Milestone</div><div>Deadline</div><div>Progress</div><div>Manual Progress</div></div> <tr><td colspan="7">Page 3</td></tr>							Page 3						
Page 3													

ID	Task Mode	Task Name	Duration	Start	Finish	September 21 8/25 10/13 12/1	January 1 1/19 3/9 4/27	April 11 6/15 8/3	July 21 9/21 11/9 12/28	November 1 1/15 2/15
88		Final Torque System Assembly	5 days	Mon 11/17/14	Fri 11/21/14					
89		Project Update Memo to Flowserve	0 days	Fri 9/26/14	Fri 9/26/14					9/26
90		Product Testing	62 days	Fri 10/24/14	Mon 1/19/15					
91		Hardware Demo	0 days	Fri 11/14/14	Fri 11/14/14					11/14
92		Flowserve Testing	0 days	Mon 1/19/15	Mon 1/19/15					1/19
93		Final Presentations and Report	56 days	Mon 11/10/14	Mon 1/26/15					
94		Prepare for Expo	6 days	Mon 11/10/14	Mon 11/17/14					
95		Senior Project Expo	0 days	Thu 11/20/14	Thu 11/20/14					11/20
96		Final Report	5 days	Tue 1/20/15	Sun 1/25/15					
97		Final Report Due	0 days	Mon 1/26/15	Mon 1/26/15					1/26

Project: Flowserve Senior Project

Date: Sun 1/25/15

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Progress

Manual Progress

Appendix G1:
System Operation Manual

Operations Manual

The following serves as a guide for general assembly and disassembly of the torque test system. It does not provide any information regarding seal face technology. For maintenance and repair information, please reference the Maintenance and Repair section of the report.

Assembly

The picture at right is an end view of the system. The secondary gland and pressure vessel end cap is removed and the internal system is empty. The seal shaft is in the center of the pressure vessel and has eight allen wrench head screws around the perimeter and has one central screw. After ensuring that the cavity is rid of all dust and particulates using a clean cloth, place the

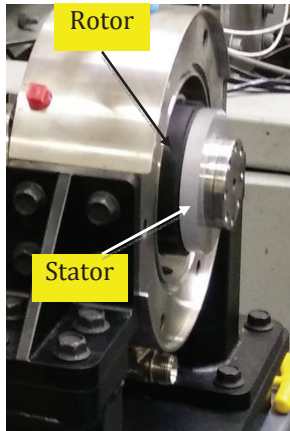


Figure G2. Rotor and stator identified. Stator is made from clear quartz

seal assembly on the seal shaft. Insert the retaining washer. Lubricate the o-rings and insert before inserting the stationary face assembly. Ensure that the proper spring is used per Flowserve's proprietary testing procedures. Next, lubricate all o-rings associated with the rotor assembly, tightening the set-screw from the rotating face to the seal shaft. Insert the rotor sleeve to complete the mechanical seal assembly. Tighten all socket head cap screws.

Before fastening the secondary gland to the primary gland, lubricate all pertinent o-rings. Ensure that the sight glass screws are tight on the secondary gland. After checking the sight glass, place the secondary gland on the end of the vessel, lining up the six perimeter screws with the six holes in the primary gland. Two technicians should participate in this step to ensure the safety of the pressure vessel. Tighten these screws.

After the pressure vessel is tightly secured, attach the pressure relief system, which is also the water exit, to the exit located on top of the primary gland, as seen in Figure G3. During the testing phase, the relief valve was set to open if the internal pressure



Figure G1. End view of the torque tester. Secondary gland is not attached to system

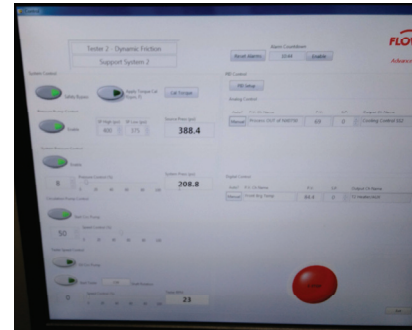


Figure G3. Line for water outlet is located at the top of the pressure vessel

exceeded 220 psig. However, this should be verified before any seal testing procedure begins. Connect the support system. This entails press fitting a tube to the inlet port on the bottom of the primary gland. An exit line will be connected to the outlet with the pressure relief mechanism. (This report was completed before Flowserve designated a support system for this tester. It is up to Flowserve's discretion which support system to connect to the tester.)

Operation

The scope of this project did not deal with the DAQ system or operation of the tester. LabVIEW will still be the operating software for this new system. It will control the pressure and the motor RPM to simulate different environments for the mechanical seals. Consult Flowserve's existing material on operating procedures for more information.



Disassembly

Before disassembling, make sure all electrical power to the system is turned off. Drain all the water from the vessel using the bleed line on the outlet. Make sure there is a clean, level work-space for the technicians to place the system components on during assembly. Disconnect the tester from the support system inlets and outlets, and the leakage system port. Two technicians should take the secondary gland off and gently place it on a clean surface. Carefully remove all the components mentioned in the **Assembly** portion of this manual. Clean all components with an industrial safe wipe.

Appendix G2:
Safety Considerations

Safety Considerations

As mentioned throughout the design section of this document, the new tester has been designed to comply with all applicable industrial and professional standards. This section discusses safety considerations for all who interact with the tester, as well as the safety of the system components.

This system operates with water with conditions up to 200° F and 200 psig from a support system. If the tester is properly connected to the support system (see operations manual) there should be no safety concerns. However, a loose connection at the inlet and outlet lines could result in hot, pressurized water causing injury to the user. One must also take care when disassembling the system. Heavy components such as the pressure vessel end cap could cause bodily injury if not held properly during disassembly. During testing, it is important to slowly ramp up the pressure after assembling the system with a seal configuration. During initial testing, the vessel was pressurized to 250 psig to test for failure. There was no failure, nor any damage to the system. However, we advise that the system is initially pressurized with all technicians and engineers out of the testing room, in case the vessel end cap was not securely fastened.

During the testing phase of this project, we had the opportunity to operate the system in Flowserve's facility. Given the weight of the system, extreme caution must be taken whenever the system is moved using the mobile table. While we realized through physical simulation that the table cannot be lifted or tipped from exertion by the average human at the top level of the table, there is a possibility that the table could tip if it is moved across an even surface. Therefore, we advise to only transport this table across surfaces with less than or equal to a 10° grade. To protect the integrity of the sight glass of the pressure vessel, it is advised that two technicians assist in the assembly and disassembly. While disassembling, all parts should be placed on a level, clean surface so that parts remain clean and safe. This is essential to maintain the sealing effect within the pressure vessel. All o-rings should be lubricated before being placed in their proper locations during assembly. The motor should be disconnected from electrical power during assembly and disassembly. One final safety consideration is also mentioned in further detail in the Further Recommendations section of this report, but it deals with operating at the systems natural frequency to prevent severe vibrations of the table. To prevent injury to technicians or damage to the components, it is important that all components be securely mounted to the table or one of its accompanying shelves.

Appendix II:
Test Results, Calibration Data
Telemetry System

Cal Poly Calibration Tester Data												
	grams input pulley	grams input bar	lbs IP	lbs IB	in-lbs IP	in-lbs IB	in-lbs sum	V Output V	in-lbs from conversion	% diff	-	Pulley Side
#												
1	992.34	991.92	2.18	2.18	10.92	10.91	21.83	4.34	21.70	0.58		left
2	410.28	411.54	0.90	0.91	4.51	4.53	9.04	1.74	8.70	3.91		left
3	1172.73	1172.73	2.58	2.58	12.90	12.90	25.80	5.11	25.55	0.98		left
4	2132.10	2134.77	4.69	4.70	23.45	23.48	46.94	9.20	46.00	2.03		left
5	411.54	410.28	0.91	0.90	4.53	4.51	-9.04	-1.79	-8.95	1.01		right
6	1172.73	1172.73	2.58	2.58	12.90	12.90	-25.80	-5.01	-25.05	2.99		right
7	2132.10	2134.77	4.69	4.70	23.45	23.48	-46.94	-9.14	-45.70	2.70		right
8	992.34	991.92	2.18	2.18	10.92	10.91	-21.83	-4.26	-21.30	2.47		right

Appendix I2:
Test Results, Raw Data
Telemetry System

Raw Data from Flowserve Testing

Time	Cooling Wtr-OUT of Hxcr	Process OUT of NX0750	Front Brg Temp	Seal Chamber OUT Temp	Rear Brg Temp	Seal Chamber Pressure	Torque Collar	System Pressure	Source Pressure	RPM
HRS	F	F	F	F	F	PSI	in-lbs	PSI	PSI	RPM
0	70.6276	73.5804	93.8127	68.8695	86.6804	48.846	-8.7023	51.381	391.6051	1496.9483
0.0001	70.6242	73.5838	93.8338	68.8286	86.7179	48.4352	-8.3616	51.8184	392.9443	1495.2
0.0002	70.6324	73.6159	93.8553	68.8512	86.6825	48.4539	-8.4504	51.2073	392.8399	1496.6918
0.0003	70.6547	73.6151	93.8896	68.8527	86.6916	48.6955	-8.5029	50.5088	391.7878	1496.8922
0.0004	70.6478	73.6057	93.8594	68.8555	86.6816	48.9426	-8.6108	51.041	392.3913	1497.0685
0.0005	70.6513	73.5965	93.8835	68.8236	86.6804	48.5951	-8.6283	51.7025	393.0392	1495.0808
0.0006	70.6613	73.5916	93.8352	68.857	86.6806	48.6894	-8.5683	51.5815	391.6308	1497.3696
0.0007	70.6306	73.5963	93.7839	68.8557	86.6616	48.7865	-8.7643	50.6197	392.336	1498.3589
0.0008	70.6579	73.598	93.8159	68.8325	86.6612	48.7862	-8.6112	51.7123	392.7007	1495.4913
0.0011	70.6715	73.5988	93.839	68.8475	86.732	48.5329	-8.663	50.5125	392.5464	1496.0827
0.0011	70.6695	73.6044	93.8456	68.8721	86.6601	48.8199	-8.5039	51.7616	393.0669	1495.5297
0.0013	70.6508	73.5811	93.8449	68.8594	86.6539	48.4894	-8.3129	51.7724	393.3998	1494.073
0.0014	70.66	73.6052	93.8307	68.8648	86.6604	48.8562	-8.5347	50.361	391.666	1496.6277
0.0015	70.6391	73.6036	93.8633	68.8438	86.6869	48.4974	-8.6664	50.5069	393.6329	1496.6106
0.0016	70.6644	73.6044	93.8479	68.8898	86.6725	48.6323	-8.3284	51.4586	393.7535	1497.2689
0.0017	70.6599	73.6121	93.8345	68.8587	86.6726	48.6058	-8.3482	51.6204	393.0344	1495.545
0.0017	70.6794	73.6118	93.8742	68.8653	86.6913	48.8079	-8.4353	51.4697	392.9949	1494.7282
0.0019	70.6654	73.6207	93.8766	68.8626	86.6963	48.5032	-8.4122	51.7764	393.089	1497.4693
0.0021	70.6725	73.6049	93.8567	68.8808	86.6991	49.0977	-8.4605	50.1577	391.6715	1495.4655
0.0022	70.6365	73.6072	93.8537	68.8624	86.6682	48.9017	-8.5022	51.7173	393.0226	1497.309
0.0025	70.6694	73.6094	93.8704	68.8265	86.6988	48.7969	-8.2837	51.7759	391.8162	1496.2733
0.0026	70.6695	73.5993	93.8769	68.8501	86.6789	48.6026	-8.6242	51.9575	392.8177	1496.1949
0.0026	70.6457	73.6077	93.8821	68.8702	86.73	48.7578	-8.5426	50.567	392.8066	1497.2853
0.0027	70.6535	73.6082	93.8757	68.8514	86.6969	48.5152	-8.7413	52.0809	394.3691	1496.1123
0.0028	70.6657	73.6375	93.8969	68.8607	86.6867	48.9799	-8.6896	51.3093	393.4263	1497.247
0.0029	70.6894	73.6269	93.8771	68.8427	86.7196	48.7716	-8.6272	51.7505	393.0669	1496.6918
0.0032	70.6616	73.6118	93.8709	68.8619	86.7057	48.7837	-8.5289	50.5938	391.7269	1497.9021
0.0033	70.6802	73.6126	93.8524	68.8713	86.6974	48.9844	-8.5957	49.9434	393.388	1496.5636
0.0033	70.6647	73.6341	93.8948	68.8316	86.6554	48.6938	-8.7727	51.7477	393.0079	1498.5809
0.0034	70.659	73.6195	93.8838	68.8648	86.6528	48.7624	-8.4947	51.8171	392.9949	1498.3109
0.0035	70.6506	73.6136	93.9014	68.8723	86.7034	48.8348	-8.5439	51.2479	391.3725	1499.0082
0.0036	70.6716	73.6092	93.8766	68.8719	86.7051	48.7107	-8.7001	51.8148	392.7643	1494.556
0.0038	70.6545	73.6238	93.9133	68.8749	86.6886	48.7134	-8.4366	51.6664	393.2145	1495.6447
0.004	70.6542	73.6138	93.9148	68.8641	86.7094	48.9311	-8.7521	50.5811	391.7209	1495.6753
0.004	70.661	73.6394	93.8667	68.8961	86.694	48.7085	-8.6917	50.9745	392.707	1496.2991
0.0042	70.6695	73.6197	93.936	68.8536	86.7204	48.6936	-8.6915	52.0758	392.8675	1496.4995
0.0043	70.6567	73.6212	93.8659	68.8807	86.7162	48.9648	-8.6005	51.281	391.7791	1499.7002
0.0044	70.7188	73.6077	93.889	68.9007	86.7442	49.1367	-8.7159	51.3366	392.6405	1497.2208
0.0045	70.6728	73.6205	93.9236	68.8872	86.7232	48.7633	-8.5823	51.6508	392.7679	1498.3349
0.0047	70.6904	73.6304	93.929	68.8849	86.7286	48.8032	-8.5081	50.616	391.6161	1494.8564
0.0049	70.6513	73.6195	93.8999	68.8785	86.7171	48.9017	-8.4928	49.9434	392.1532	1497.4773
0.005	70.6828	73.6351	93.8736	68.913	86.7021	48.8555	-8.5352	51.2987	393.4581	1495.6753
0.0051	70.6633	73.6204	93.8918	68.8995	86.6912	48.9319	-8.4581	50.5529	393.8289	1498.4429
0.0052	70.6728	73.6226	93.8667	68.8986	86.6903	48.7533	-8.7548	51.2174	392.9708	1494.6173
0.0053	70.6577	73.6221	93.888	68.903	86.7092	48.6467	-8.5439	51.6593	392.7696	1497.7989
0.0055	70.6567	73.6456	93.9378	68.8653	86.747	48.7525	-8.4554	50.9099	392.0122	1497.6303
0.0057	70.6501	73.6386	93.908	68.8918	86.7126	48.8487	-8.4713	50.9043	394.0193	1495.7621
0.0058	70.6655	73.6324	93.9053	68.9157	86.7363	48.9062	-8.5597	51.73	392.0228	1497.7299
0.0059	70.6723	73.6327	93.9487	68.8818	86.7255	48.6815	-8.6961	51.551	393.8809	1496.2911
0.0059	70.6616	73.6187	93.9336	68.8856	86.7162	49.1008	-8.3484	50.8356	392.8013	1496.81

0.006	70.6572	73.6432	93.9365	68.8747	86.7057	48.9138	-8.5715	49.7475	393.006	1496.5556
0.0061	70.656	73.6424	93.9496	68.892	86.7419	48.684	-8.5502	51.783	393.2357	1497.9293
0.0062	70.6695	73.6503	93.9237	68.9103	86.7334	48.7438	-8.5143	50.8747	392.5851	1496.259
0.0063	70.6689	73.6138	93.8956	68.9107	86.7071	48.8422	-8.4945	52.14	392.1075	1495.2613
0.0064	70.6352	73.6289	93.9074	68.8963	86.6841	48.9463	-8.6147	50.4793	392.2529	1494.1671
0.0067	70.6713	73.6285	93.9657	68.9059	86.7581	48.9293	-8.5532	51.281	392.9761	1496.327
0.0068	70.6447	73.6336	93.9042	68.8851	86.7085	48.7525	-8.5351	51.3906	392.1393	1494.027
0.0069	70.6784	73.6261	93.911	68.9051	86.708	48.8023	-8.3934	50.4719	391.1344	1495.5617
0.007	70.6728	73.6446	93.9112	68.8898	86.6719	48.9177	-8.4472	51.122	393.2409	1496.051
0.0071	70.6601	73.6295	93.9227	68.8892	86.7077	48.9879	-8.6098	51.8572	392.7749	1497.1396
0.0072	70.6781	73.6488	93.9207	68.8842	86.6923	49.1451	-8.5656	51.8688	392.8952	1495.5377
0.0073	70.6765	73.6458	93.9106	68.9088	86.6786	49.1159	-8.5794	51.6275	392.4147	1494.5024
0.0074	70.6899	73.6452	93.9236	68.8949	86.7055	48.9574	-8.3989	51.259	392.7679	1496.8521
0.0075	70.6433	73.659	93.9587	68.889	86.7414	48.8697	-8.5312	51.7512	391.7367	1496.396
0.0076	70.6896	73.6399	93.9643	68.8925	86.7817	49.3021	-8.7804	51.1371	393.3271	1497.0365
0.0076	70.6611	73.6524	93.9339	68.9323	86.7456	48.8147	-8.5739	52.4617	393.617	1496.0433
0.0077	70.658	73.6542	93.9481	68.8812	86.735	48.9045	-8.6209	51.0151	393.4379	1494.9526
0.0078	70.6682	73.644	93.9257	68.9225	86.7202	49.1219	-8.5482	51.6064	391.8321	1495.4816
0.0079	70.6692	73.645	93.9089	68.9081	86.6856	49.0717	-8.6356	51.5842	392.3194	1501.3485
0.0082	70.6435	73.6543	93.9355	68.912	86.6963	48.7693	-8.4073	51.6275	392.1605	1494.372
0.0083	70.6748	73.6539	93.9087	68.9118	86.6888	48.7302	-8.4445	50.6907	391.6361	1495.4837
0.0084	70.6472	73.636	93.9723	68.9272	86.7235	48.6663	-8.3502	51.7795	392.8172	1497.9139
0.0085	70.6633	73.6493	93.9347	68.9137	86.7241	49.146	-8.5708	51.5399	392.3747	1498.5353
0.0086	70.6753	73.6562	93.9231	68.9198	86.715	49.0206	-8.4919	51.9427	394.5453	1497.83
0.0087	70.6797	73.6529	93.9463	68.9076	86.7713	49.2138	-8.5735	50.5495	390.8686	1496.8762
0.0089	70.6674	73.656	93.9239	68.89	86.7285	48.9964	-8.6325	51.7136	390.553	1495.2411
0.009	70.6586	73.6451	93.9641	68.9042	86.7201	49.1594	-8.8328	50.8851	393.3204	1497.8833
0.009	70.6737	73.6573	93.9236	68.9195	86.7087	48.7658	-8.6637	50.9205	391.17	1495.9053
0.0091	70.6756	73.6616	93.9858	68.9373	86.7298	49.3141	-8.5891	51.854	392.9285	1494.3515
0.0092	70.683	73.6537	93.9577	68.9293	86.7117	49.1711	-8.5544	51.6138	392.9617	1498.6555
0.0093	70.6816	73.6534	93.9466	68.9526	86.7026	49.1239	-8.6799	50.0262	391.5831	1496.3193
0.0094	70.6687	73.6598	93.9539	68.9102	86.6674	49.0095	-8.6215	51.769	392.9285	1494.7763
0.0095	70.6843	73.6473	93.9683	68.912	86.7249	48.8822	-8.6388	51.8984	393.3437	1494.7522
0.0096	70.6882	73.6526	93.9988	68.9393	86.7501	48.8946	-8.5017	51.175	392.2929	1497.0783
0.0097	70.6741	73.6855	93.9641	68.9	86.7232	49.1386	-8.435	52.7521	392.7623	1496.0506
0.0099	70.6745	73.678	93.9803	68.9401	86.7606	49.0297	-8.6528	50.0756	391.6891	1497.2623
0.01	70.6625	73.6661	93.9684	68.933	86.739	49.274	-8.5062	50.5422	391.7156	1494.4334
0.0101	70.6723	73.6612	93.9832	68.9308	86.732	49.338	-8.6321	51.5497	392.8649	1497.9599
0.0103	70.6702	73.669	93.9428	68.9424	86.679	48.8116	-8.6579	50.8636	393.1278	1496.5556
0.0104	70.6912	73.6516	93.9468	68.9337	86.7084	49.0745	-8.6542	50.786	391.1676	1497.9422
0.0106	70.6726	73.659	93.9857	68.9383	86.7515	49.1274	-8.4032	50.9664	392.8967	1494.97
0.0107	70.6762	73.67	93.967	68.934	86.7521	49.0857	-8.4646	51.1255	392.7219	1496.695
0.0108	70.694	73.6748	93.9597	68.939	86.7239	49.107	-8.4897	51.7542	393.7923	1497.2449
0.0108	70.6765	73.6702	93.9836	68.9533	86.7543	49.2589	-8.5219	51.9951	392.8808	1495.0313
0.0109	70.6858	73.682	93.9497	68.9289	86.6911	48.8339	-8.6536	52.6412	392.3249	1495.738
0.011	70.642	73.648	93.9657	68.9401	86.7169	49.3025	-8.4345	50.8003	392.7219	1497.5689
0.011	70.6881	73.6511	94.0032	68.9293	86.7295	48.9853	-8.6002	51.3329	391.2784	1497.2288
0.0111	70.6775	73.6639	93.9585	68.9793	86.6879	49.1185	-8.6792	51.9668	392.0333	1493.9734
0.0112	70.6473	73.697	93.9477	68.9294	86.6839	48.9556	-8.6125	50.0432	391.6715	1494.2553
0.0112	70.6429	73.6774	93.9956	68.9472	86.7396	49.1144	-8.8786	51.8688	392.8399	1496.4193
0.0113	70.6716	73.6775	94.0061	68.9516	86.7259	49.2021	-8.8655	52.8293	393.7547	1495.0697
0.0114	70.6375	73.6516	93.9876	68.9416	86.7265	48.9314	-8.5974	52.0754	391.6493	1497.0204
0.0115	70.6706	73.6619	93.9558	68.9472	86.7336	49.33	-8.7581	51.981	392.224	1495.177

0.0116	70.645	73.6641	93.9638	68.9458	86.6748	49.3067	-8.6031	51.8947	394.1909	1495.7861
0.0117	70.6618	73.6835	93.9938	68.9556	86.7277	49.2166	-8.4565	51.2479	390.8963	1496.2189
0.0118	70.6438	73.6766	93.9938	68.9392	86.7087	49.2207	-8.5723	51.0442	390.7675	1498.2206
0.0119	70.6409	73.6932	93.9698	68.9569	86.696	48.9862	-8.4737	50.4645	392.707	1494.5759
0.012	70.6309	73.6705	94.0024	68.9618	86.7287	49.3021	-8.6909	52.0388	393.2552	1494.2713
0.0122	70.6572	73.6687	94.0181	68.9598	86.7267	48.9872	-8.6329	52.0721	392.6848	1497.0926
0.0125	70.6394	73.677	94.0201	68.9756	86.6891	49.1799	-8.2326	50.6059	391.027	1496.948
0.0126	70.6511	73.6766	94.0225	68.9266	86.7278	49.0866	-8.3981	51.1397	392.5312	1494.6633
0.0127	70.6342	73.6942	94.0242	68.9736	86.7227	49.0605	-8.5131	51.4845	1499.0162	
0.0128	70.6462	73.6935	94.0138	68.9401	86.7173	49.408	-8.6404	52.2901	392.347	1495.5777
0.013	70.6419	73.6738	94.0239	68.9452	86.7148	49.3885	-8.6671	51.3293	391.9373	1496.9162
0.0131	70.6499	73.6851	93.9984	68.9511	86.6915	49.1905	-8.6302	52.6809	392.2081	1494.0347
0.0132	70.6384	73.6931	94.0099	68.9701	86.7127	49.0403	-8.8028	51.9633	391.8956	1495.2537
0.0134	70.6188	73.6883	93.9933	68.9533	86.6864	49.2376	-8.5525	52.6985	390.7039	1498.5426
0.0134	70.6345	73.6795	93.9935	68.9535	86.7229	49.0004	-8.496	52.2319	392.1234	1495.959
0.0136	70.6406	73.6827	93.9837	68.9582	86.7429	49.0698	-8.6884	51.078	393.233	1495.9865
0.0137	70.6255	73.6702	94.0654	68.9437	86.7539	49.5938	-8.7689	51.684	392.1532	1496.0747
0.0139	70.6232	73.6829	94.0034	68.9318	86.7038	49.6232	-9.1666	52.0623	392.1975	1494.0807
0.014	70.6349	73.6897	93.9792	68.9586	86.7038	49.2198	-8.8761	51.525	392.5153	1496.833
0.014	70.6418	73.6966	94.0433	68.9623	86.7656	49.0803	-8.5335	52.5218	391.8533	1494.1574
0.0141	70.6422	73.7021	94.0141	68.9659	86.7303	49.4284	-8.7968	50.9006	391.4555	1496.3632
0.0143	70.6237	73.7224	93.985	68.9719	86.6999	49.3558	-8.7504	51.6522	392.2505	1494.395
0.0144	70.6455	73.6901	94.0315	68.9733	86.735	49.1627	-8.5992	51.1962	393.0613	1495.9705
0.0145	70.6518	73.6889	93.9847	68.9618	86.7287	49.2621	-8.7233	52.3381	392.2086	1496.9002
0.0146	70.6432	73.6955	94.012	68.9715	86.7257	49.369	-8.645	52.0277	391.6493	1497.2128
0.0147	70.6376	73.6827	94.0013	68.9736	86.7259	49.4073	-8.306	52.2991	392.1181	1497.3849
0.0148	70.6406	73.688	93.9975	68.9772	86.6955	49.4171	-8.6233	52.6632	392.3511	1493.7664
0.0149	70.6181	73.6909	94.0352	68.9746	86.7363	49.5018	-8.6406	52.1164	391.223	1495.698
0.0151	70.6473	73.6843	93.9996	68.982	86.7386	49.3067	-8.5921	51.3699	389.883	1494.7602
0.0152	70.6389	73.701	94.0004	68.9973	86.7493	49.6881	-8.6502	52.444	392.6848	1495.1387
0.0153	70.6442	73.7067	94.0045	68.992	86.708	49.277	-8.5799	53.2916	392.6793	1497.6777
0.0155	70.6472	73.6873	94.0377	68.9885	86.7334	49.3585	-8.6991	51.6381	393.331	1495.9743
0.0155	70.6753	73.7007	93.9962	68.9734	86.6941	49.4722	-8.6432	51.9916	393.1297	1495.637
0.0158	70.6133	73.7065	94.0118	68.9534	86.7153	49.2761	-8.6371	51.976	391.2507	1498.6234
0.016	70.6648	73.7024	93.9838	68.9779	86.735	49.5699	-8.6716	52.391	392.5153	1496.051
0.0161	70.656	73.6912	94.0305	68.9616	86.7722	49.593	-8.5704	52.1506	392.8543	1496.833
0.0164	70.6488	73.7139	94.0832	69.0078	86.749	49.3652	-8.5548	51.1297	393.3548	1495.4976
0.0165	70.6907	73.7276	94.0646	68.9736	86.7227	49.577	-8.8514	52.0425	393.2164	1494.64
0.0166	70.6603	73.7126	94.0412	68.9704	86.7144	49.473	-8.7593	52.5008	393.2718	1495.9144
0.0167	70.6528	73.7149	93.9952	69.0066	86.7101	49.545	-8.8508	52.4794	391.9751	1495.3993
0.0168	70.657	73.7016	94.0481	69.0234	86.7568	49.6606	-8.6891	50.3795	391.4445	1498.8479
0.0169	70.6591	73.7212	94.0675	68.9795	86.722	49.6295	-8.6001	50.9028	391.0694	1495.3687
0.0169	70.6611	73.7158	94.086	68.9738	86.7406	50.1004	-8.7717	51.3588	391.1488	1495.1387
0.0171	70.6641	73.7215	94.0818	68.9577	86.7323	49.8827	-8.5584	52.1534	393.4102	1498.2628
0.0172	70.6631	73.7129	94.0445	68.9758	86.7256	49.6339	-8.4155	52.0375	392.8278	1495.0467
0.0174	70.6713	73.7185	94.055	69.0099	86.746	49.7154	-8.4364	53.1068	392.7236	1496.0025
0.0176	70.6577	73.7319	94.0421	68.9856	86.7038	49.426	-8.6919	52.2958	391.9221	1493.8507
0.0178	70.6582	73.7251	94.0477	69.0133	86.7264	49.7325	-8.4087	51.4861	391.0164	1495.476
0.0178	70.6452	73.6924	94.0355	69.026	86.7087	49.7628	-8.8282	50.6862	390.6859	1496.2109
0.018	70.6641	73.7215	94.0135	69.014	86.6866	49.9876	-8.5595	50.653	391.2562	1494.7282
0.0181	70.6579	73.7371	94.0254	68.9736	86.7162	49.6037	-8.52	51.3836	392.2198	1497.6073
0.0181	70.6418	73.7112	94.0437	68.9922	86.7443	49.8685	-8.4581	52.5713	392.3141	1496.58
0.0182	70.6508	73.7312	94.0699	68.984	86.7507	49.8808	-8.5844	52.3418	392.8842	1497.1487

0.0183	70.6427	73.7205	94.0453	68.972	86.7363	49.4005	-8.5118	52.3973	392.5464	1497.8941
0.0184	70.6467	73.7067	94.0579	69.0103	86.7236	49.76	-8.7152	51.9945	392.9118	1496.9323
0.0185	70.6264	73.7398	94.068	68.9874	86.7492	49.5726	-8.8699	53.4727	393.2992	1495.8287
0.0186	70.6411	73.73	94.0795	68.9966	86.7123	49.6152	-8.663	52.642	391.9327	1497.6686
0.0187	70.6577	73.7279	93.9998	68.9873	86.7185	49.5882	-8.7238	52.4268	391.9982	1494.095
0.019	70.6425	73.7217	94.0288	69.0039	86.7583	49.9716	-8.5087	51.5002	391.7261	1497.0476
0.0191	70.6679	73.7304	94.0656	68.9772	86.7211	49.8994	-8.6257	52.5008	391.7435	1496.4113
0.0192	70.6741	73.7289	94.0433	68.9802	86.7469	49.8399	-8.5436	52.4712	391.2396	1497.4613
0.0192	70.6455	73.7105	94.0329	68.9901	86.7264	49.721	-8.4956	51.5732	392.2806	1497.2048
0.0193	70.6367	73.7329	94.0657	69.0169	86.7178	49.6845	-8.704	52.391	392.6795	1497.6686
0.0194	70.6725	73.7223	94.0997	68.9964	86.7528	50.0043	-8.6417	52.231	392.3803	1493.5019
0.0197	70.6677	73.7371	94.0266	69.0115	86.7295	49.6801	-8.5706	52.444	392.8013	1497.0936
0.0198	70.6748	73.7424	94.029	69.0219	86.6895	49.7582	-8.733	53.3212	393.2385	1495.2171
0.0199	70.7014	73.746	94.0301	69.0384	86.7058	49.9756	-8.8635	52.2088	393.1998	1496.9243
0.02	70.6594	73.7288	94.057	68.9884	86.7236	49.9147	-8.7776	52.5289	391.8374	1494.0807
0.0202	70.6621	73.7632	94.0841	69.0183	86.7532	49.8436	-8.749	52.0057	391.7897	1495.913
0.0203	70.6775	73.7541	94.1059	69.0233	86.7509	49.9911	-8.4662	51.4931	390.6827	1494.395
0.0204	70.6777	73.7478	94.0674	69.0327	86.7254	49.9365	-8.5485	51.1334	390.4533	1496.4193
0.0205	70.6596	73.7388	94.1612	68.9985	86.7578	49.8187	-8.8316	51.9067	391.8109	1497.8066
0.0206	70.6853	73.7351	94.1097	69.0051	86.7522	49.7592	-8.601	51.8007	391.2177	1496.764
0.0207	70.6867	73.7219	94.0522	69.0447	86.7188	49.8703	-8.6875	52.6208	392.8066	1496.557
0.0208	70.6966	73.7488	94.0683	69.0208	86.7315	49.9142	-8.6474	52.3049	391.4334	1495.738
0.0208	70.6621	73.7144	94.0935	69.0205	86.753	49.9582	-8.785	52.9071	392.0386	1496.0203
0.021	70.6689	73.7456	94.0445	69.0345	86.7353	49.9431	-8.5277	52.4617	393.4475	1498.0673
0.021	70.6904	73.7598	94.1177	69.0157	86.7336	50.1359	-8.8966	52.0976	392.2028	1495.0697
0.0211	70.6835	73.7562	94.0832	69.0078	86.7819	49.7693	-8.443	53.506	392.2917	1495.4175
0.0212	70.6696	73.7293	94.1022	69.0415	86.7762	50.2959	-8.8608	53.303	392.3723	1499.4932
0.0212	70.6618	73.7371	94.0888	69.0339	86.7545	49.9616	-8.6252	52.5858	392.336	1497.317
0.0213	70.6755	73.7815	94.0989	68.9746	86.7632	49.9325	-8.4595	52.4688	392.9549	1496.1736
0.0214	70.6914	73.7461	94.1071	69.0001	86.7642	49.9707	-8.5565	52.9813	394.1519	1496.81
0.0215	70.6921	73.7395	94.0977	69.015	86.7232	49.9094	-8.4915	52.9106	391.4507	1494.8243
0.0215	70.6977	73.75	94.1112	68.9797	86.7683	49.8534	-8.4412	52.9849	393.135	1494.579
0.0217	70.6933	73.7505	94.0891	69.0063	86.751	49.8907	-8.7521	53.0344	392.2558	1494.5407
0.0217	70.6626	73.7608	94.115	69.022	86.758	50.4001	-8.8216	52.4379	391.5829	1496.259
0.0219	70.6718	73.7419	94.0837	69.0415	86.8001	50.1167	-8.6678	52.2605	391.594	1496.5395
0.022	70.6623	73.7555	94.075	69.0327	86.7711	49.9858	-8.6705	51.8577	390.3536	1496.4754
0.0221	70.6715	73.7748	94.0924	69.04	86.7378	50.284	-8.6612	52.8407	390.6859	1496.2911
0.0222	70.6748	73.7552	94.11	69.0068	86.7606	49.8631	-8.5158	51.7284	391.306	1496.804
0.0222	70.6887	73.7605	94.0989	69.0162	86.7439	50.2808	-8.602	51.6664	390.1054	1497.7913
0.0223	70.664	73.7554	94.117	69.0052	86.7596	49.8747	-8.8124	51.5603	392.3035	1498.1363
0.0224	70.667	73.7729	94.0776	69.0191	86.7346	49.8889	-8.9172	52.5465	392.6477	1496.4343
0.0224	70.6705	73.7917	94.0999	69.017	86.7429	49.9022	-8.615	52.996	392.707	1494.7282
0.0226	70.6547	73.7453	94.1206	69.043	86.7839	50.1158	-8.6933	53.1992	392.6018	1496.4915
0.0228	70.653	73.7566	94.1648	69.0487	86.793	50.4585	-8.5265	53.7661	392.0228	1492.8004
0.0228	70.6583	73.7565	94.1216	69.0288	86.7723	50.0508	-8.7529	52.3492	393.078	1497.5574
0.023	70.6764	73.7414	94.1135	69.0308	86.7692	50.1084	-8.6018	52.3529	391.4334	1496.9483
0.0231	70.6926	73.7473	94.0971	69.0706	86.759	50.3296	-8.5379	52.4158	393.8447	1497.4079
0.0231	70.6772	73.7661	94.0974	69.0611	86.7835	50.1804	-8.3375	52.9919	392.3564	1496.4113
0.0232	70.6804	73.7571	94.1164	69.0731	86.7469	50.0826	-8.6667	52.5819	392.6213	1499.7462
0.0233	70.6728	73.7736	94.1251	69.0502	86.7479	50.0359	-8.7047	53.4431	393.1167	1496.8601
0.0235	70.6915	73.7667	94.0707	69.0386	86.7237	50.0071	-8.735	52.449	391.9317	1496.0506
0.0235	70.6753	73.7471	94.1001	69.0394	86.7523	50.1661	-9.1619	53.7696	392.1287	1495.3303
0.0236	70.6833	73.7534	94.1032	68.9998	86.7588	50.2282	-9.0715	53.7388	391.6327	1497.309

0.0237	70.6687	73.7746	94.1588	69.0075	86.7917	50.2329	-8.7279	53.4616	392.3304	1495.9144
0.024	70.6726	73.7737	94.1153	69.0327	86.7772	50.5162	-8.7646	53.2924	391.4772	1497.4309
0.024	70.6789	73.7849	94.0956	69.0398	86.7697	50.2621	-8.7087	52.5041	391.4666	1498.2283
0.0242	70.6828	73.7937	94.1157	69.0699	86.768	50.5384	-8.9443	51.5144	391.0217	1495.039
0.0243	70.6682	73.7868	94.1289	69.0464	86.7745	50.2236	-8.6909	52.0684	391.5884	1495.5617
0.0244	70.683	73.7685	94.1441	69.0311	86.805	50.4502	-8.7033	52.5931	391.594	1497.5013
0.0245	70.6606	73.7959	94.1216	69.022	86.769	50.3954	-8.8481	52.1188	389.491	1496.281
0.0247	70.6767	73.7973	94.1191	69.0611	86.7544	50.3145	-8.5925	51.7971	392.0969	1497.2853
0.0248	70.6726	73.7883	94.1402	69.0384	86.7441	50.3838	-8.8328	52.2249	389.2898	1497.1396
0.0249	70.6899	73.7934	94.1416	69.0252	86.7479	50.4176	-8.5261	50.9205	390.8946	1497.9063
0.0249	70.6843	73.7876	94.124	69.0158	86.7822	50.3815	-8.715	52.5266	391.9262	1495.714
0.025	70.68	73.768	94.207	69.0154	86.7996	50.4679	-8.8438	51.7173	391.6106	1497.3491
0.0251	70.68	73.8062	94.1357	69.0353	86.7839	50.4716	-8.8436	52.024	392.2308	1495.2171
0.0253	70.6545	73.7898	94.1665	69.0112	86.8286	50.3039	-8.6878	52.8258	393.2621	1497.9293
0.0254	70.6784	73.7843	94.1641	69.0436	86.7869	50.5422	-8.6886	52.0018	391.7213	1496.243
0.0255	70.6626	73.7612	94.1578	69.0538	86.8053	50.5598	-8.8105	54.3564	392.2876	1496.8176
0.0256	70.6866	73.7746	94.1972	69.0285	86.805	50.6834	-8.6399	52.6892	392.3969	1494.7201
0.0258	70.668	73.7891	94.1784	69.0453	86.8394	50.6973	-8.5761	52.9812	390.3592	1497.3731
0.0258	70.6779	73.7787	94.1572	69.0392	86.8308	50.5952	-8.7257	52.5968	391.5829	1497.9021
0.0261	70.6613	73.7901	94.1777	69.0267	86.8133	50.7206	-8.7804	53.1216	392.6294	1498.2387
0.0264	70.6465	73.789	94.1672	69.0633	86.7906	50.4363	-8.8186	53.3737	391.8797	1496.3653
0.0265	70.6355	73.7829	94.1675	69.0342	86.8199	50.8779	-8.6054	52.9849	391.599	1498.2513
0.0266	70.6514	73.8108	94.1737	69.0508	86.8194	50.4456	-8.8775	52.8334	392.264	1496.4434
0.0267	70.654	73.7844	94.166	69.0596	86.8135	50.805	-8.8798	52.596	392.4624	1497.5919
0.0267	70.6302	73.7896	94.203	69.0165	86.7905	50.65	-8.9278	54.1453	392.7125	1496.1709
0.0268	70.6281	73.808	94.1719	69.0464	86.7796	50.5329	-8.7904	53.5318	391.3891	1496.78
0.0269	70.6455	73.8076	94.1909	69.0531	86.8264	50.8743	-9.0416	53.3384	391.848	1499.3246
0.0269	70.6452	73.8047	94.1934	69.0221	86.8189	50.4995	-8.6702	53.7794	392.8122	1496.6357
0.027	70.6399	73.8069	94.174	69.0237	86.7949	50.8031	-8.9717	52.6031	393.6011	1496.5493
0.0271	70.6406	73.7899	94.18	69.0444	86.8106	50.5041	-8.8144	50.8525	391.7989	1498.92
0.0272	70.677	73.7976	94.159	69.0599	86.8066	50.8379	-8.52	52.9601	391.8215	1495.8517
0.0272	70.6579	73.8054	94.1483	69.0613	86.7886	50.6371	-8.7859	53.5752	391.991	1496.3653
0.0273	70.6588	73.7901	94.1863	69.061	86.8092	50.702	-8.7363	51.9982	391.8598	1498.0143
0.0274	70.6662	73.8001	94.2005	69.0369	86.8387	50.6305	-8.6189	53.2731	391.2673	1497.6536
0.0275	70.6386	73.813	94.1872	69.0396	86.813	50.5838	-8.9701	52.3875	391.8797	1498.4966
0.0276	70.6531	73.7922	94.2126	69.0262	86.8381	50.8376	-8.7788	52.571	391.8542	1496.3231
0.0277	70.6493	73.8011	94.208	69.0548	86.8259	50.7847	-8.7955	52.8592	391.821	1496.5716
0.0278	70.6413	73.8059	94.2172	69.0332	86.831	50.5758	-8.7666	53.4267	393.0132	1496.9633
0.0279	70.6501	73.8146	94.2115	69.0507	86.8447	50.7364	-8.9837	53.4986	391.8321	1499.0402
0.028	70.6469	73.8139	94.2133	69.0464	86.8077	50.6353	-9.0309	52.5536	391.8533	1495.798
0.0281	70.6638	73.821	94.1723	69.0416	86.7981	50.9223	-8.756	53.9747	392.9814	1496.6106
0.0282	70.6682	73.8353	94.181	69.0658	86.8292	50.8358	-8.756	53.0292	391.9428	1492.9809
0.0283	70.6621	73.8193	94.1626	69.0709	86.8223	50.8548	-8.9098	53.4798	392.2929	1494.5637
0.0284	70.6636	73.8307	94.2181	69.0062	86.836	50.6713	-8.8719	52.959	393.4545	1495.1369
0.0286	70.6618	73.8187	94.2189	69.0402	86.8369	50.6602	-8.8624	53.1623	391.295	1497.5975
0.0288	70.6521	73.8166	94.2642	68.9976	86.8708	50.8397	-9.2336	52.9495	392.1234	1496.6566
0.0289	70.6726	73.8127	94.2083	69.056	86.8317	50.7917	-8.698	52.6561	391.0588	1498.0443
0.029	70.6597	73.8364	94.2433	69.0254	86.8426	51.1116	-8.7855	53.6	391.9804	1495.982
0.0291	70.6424	73.8019	94.2091	69.0329	86.8169	50.9203	-8.7951	52.5266	392.1865	1498.3429
0.0292	70.6741	73.802	94.2552	69.0496	86.8545	50.7046	-8.8733	53.3348	392.367	1495.821
0.0293	70.6996	73.8131	94.2181	69.0625	86.8234	50.9379	-8.9047	53.421	391.0846	1494.5839
0.0294	70.6758	73.8208	94.2443	69.0582	86.8169	51.1169	-9.1664	53.2005	392.3829	1496.1813
0.0294	70.6892	73.7975	94.2389	69.0451	86.8468	50.8441	-8.6917	52.9997	391.4888	1496.6758

0.0295	70.6562	73.8134	94.1959	69.0435	86.8291	51.0218	-8.9592	52.9425	392.4624	1496.879
0.0297	70.6772	73.7881	94.2694	69.0322	86.8785	50.9259	-9.0524	55.0069	391.6679	1497.3313
0.0298	70.6782	73.8299	94.2173	69.0488	86.853	51.1878	-8.8707	52.7114	393.3327	1497.0445
0.0299	70.7034	73.841	94.2341	69.0552	86.8527	51.0218	-8.8198	53.8262	392.8172	1498.6653
0.03	70.6755	73.801	94.2631	69.0601	86.8576	51.1284	-8.6389	53.3702	392.4677	1496.189
0.0303	70.6874	73.8493	94.2244	69.0638	86.8247	50.8534	-9.0428	52.9738	391.6549	1494.2954
0.0303	70.7024	73.8181	94.2032	69.0679	86.846	51.2058	-8.6245	53.296	392.4941	1494.5867
0.0305	70.6955	73.809	94.2186	69.0502	86.8341	51.2575	-8.563	52.874	391.0015	1496.2911
0.0307	70.6851	73.8422	94.1933	69.1044	86.8216	51.2617	-8.7636	53.6707	392.0333	1497.5536
0.0308	70.6631	73.8422	94.2492	69.0876	86.8436	51.1045	-8.8478	53.2747	391.4984	1497.0706
0.0311	70.6907	73.8169	94.255	69.064	86.8604	51.0225	-8.7727	53.4357	392.0757	1495.4255
0.0314	70.7129	73.8289	94.2426	69.0284	86.8429	51.1702	-8.7731	54.5666	392.0979	1494.2553
0.0315	70.7221	73.8381	94.2315	69.0249	86.7861	50.9909	-8.7654	53.5207	393.0004	1497.6376
0.0317	70.6804	73.8522	94.2158	69.0636	86.8175	51.2564	-8.9534	55.6113	392.2399	1494.625
0.0317	70.6733	73.8506	94.2343	69.0968	86.8599	51.3337	-8.9508	54.6257	392.6128	1497.7177
0.0318	70.7185	73.832	94.2363	69.086	86.8721	51.3337	-8.9341	54.2709	391.5608	1499.2005
0.0319	70.6749	73.8394	94.2537	69.0627	86.8515	51.4173	-8.9113	53.4431	392.4024	1495.714
0.0321	70.6764	73.8435	94.2186	69.0988	86.8366	51.0708	-9.0471	55.7603	391.2617	1495.177
0.0322	70.687	73.8442	94.2474	69.0638	86.8419	51.2369	-8.647	54.5367	391.4825	1498.0979
0.0322	70.6946	73.8444	94.2448	69.0366	86.8756	51.0591	-9.0184	51.5815	392.8172	1498.9796
0.0323	70.7058	73.8473	94.2371	69.0944	86.8526	51.4544	-8.9012	54.4779	392.0868	1497.317
0.0324	70.6986	73.8503	94.233	69.1005	86.889	51.3959	-8.8049	53.6907	390.7855	1495.722
0.0326	70.7007	73.8192	94.2118	69.0995	86.8525	51.4999	-8.7003	52.6523	391.3116	1494.9045
0.0326	70.6887	73.8404	94.1954	69.0957	86.8234	51.3411	-8.7608	53.7942	391.3005	1496.0426
0.0328	70.6824	73.8371	94.2194	69.077	86.8211	51.4368	-8.8769	53.0414	390.5715	1495.292
0.0329	70.6894	73.831	94.2512	69.096	86.8718	51.1005	-8.869	52.9147	390.2816	1498.0223
0.033	70.6755	73.8474	94.2652	69.0989	86.8913	51.3915	-9.0603	52.9142	389.9942	1494.2877
0.0331	70.6751	73.8422	94.2469	69.0916	86.8776	51.3355	-8.8674	54.4114	391.0624	1498.4471
0.0331	70.6861	73.8404	94.2138	69.0862	86.8672	51.5055	-8.8844	53.469	391.5884	1494.9366
0.0332	70.6884	73.8427	94.2213	69.0913	86.8494	51.3457	-8.7246	53.6723	391.3448	1495.0648
0.0334	70.6744	73.844	94.2348	69.0871	86.8579	51.5984	-9.0232	53.9716	390.7246	1494.7763
0.0335	70.686	73.8701	94.2936	69.0983	86.8906	51.6829	-9.0084	53.9676	392.3617	1498.5043
0.0338	70.6526	73.858	94.2262	69.109	86.8695	51.5548	-8.9434	54.4631	391.7656	1493.8946
0.034	70.6759	73.8455	94.2435	69.1061	86.8692	51.3234	-8.9511	54.3855	391.7213	1498.0864
0.034	70.6643	73.8508	94.2126	69.0994	86.8191	51.4892	-9.0316	53.7095	391.0959	1495.3533
0.0342	70.655	73.8659	94.2728	69.087	86.8674	51.5176	-9.0197	53.0167	391.2759	1496.2886
0.0343	70.6588	73.8335	94.2664	69.0832	86.8743	51.5046	-8.8097	54.2672	390.8907	1496.3071
0.0344	70.6587	73.8793	94.2817	69.1107	86.8642	51.6767	-9.1682	54.671	392.3035	1497.6226
0.0344	70.6682	73.8608	94.2135	69.1064	86.8264	51.394	-8.9217	54.0899	391.1621	1494.8644
0.0345	70.6467	73.8576	94.2135	69.0858	86.8249	51.6118	-9.0436	55.576	392.0175	1495.9053
0.0346	70.6574	73.8537	94.224	69.0914	86.8087	51.3852	-8.7525	53.9287	392.1605	1496.1583
0.0347	70.6462	73.8718	94.2276	69.1	86.839	51.5718	-9.1998	53.759	392.2134	1494.142
0.0348	70.6608	73.8458	94.2444	69.1172	86.8676	51.4024	-8.7505	54.2377	391.9262	1495.8503
0.0349	70.6455	73.8588	94.2263	69.0938	86.8692	51.7389	-8.749	54.5968	391.5514	1497.247
0.035	70.654	73.8308	94.2843	69.0767	86.8765	51.7353	-8.8107	54.3635	392.2558	1496.12
0.0351	70.6258	73.8542	94.2254	69.0878	86.8358	51.5873	-8.7312	54.3486	390.409	1496.7479
0.0352	70.6137	73.8637	94.2143	69.0645	86.8305	51.8393	-8.6075	53.3525	391.6944	1494.2954
0.0353	70.6406	73.8511	94.2456	69.0877	86.8637	51.4823	-8.8284	53.6057	390.6969	1496.7159
0.0355	70.6498	73.8781	94.1951	69.144	86.8257	51.5603	-8.9846	53.3877	390.4755	1497.6937
0.0357	70.6544	73.87	94.2393	69.1095	86.8269	51.4219	-8.733	55.1061	392.2861	1496.4514
0.0358	70.6594	73.863	94.2421	69.1196	86.856	51.5656	-8.5384	54.4908	391.4931	1496.672
0.0359	70.6645	73.8852	94.2691	69.1493	86.854	51.8828	-8.8005	54.869	392.2876	1495.5143
0.036	70.6547	73.8779	94.2034	69.1498	86.8644	51.7164	-8.7836	53.602	391.4223	1495.3774

0.0361	70.669	73.8692	94.2496	69.102	86.8398	51.7322	-8.7843	53.3175	392.3138	1496.8361
0.0361	70.679	73.8801	94.2423	69.1295	86.8489	51.7895	-8.8592	53.3817	392.5736	1496.7716
0.0363	70.671	73.8662	94.2552	69.1128	86.8632	51.6588	-8.9076	54.2525	390.8686	1496.4915
0.0364	70.6971	73.8335	94.253	69.131	86.866	52.1205	-8.9896	53.1955	390.3093	1497.7819
0.0365	70.6535	73.8547	94.2239	69.15	86.8619	51.8953	-9.1951	54.7806	392.3141	1496.925
0.0366	70.6457	73.8537	94.2382	69.1084	86.8512	51.6439	-8.8692	53.979	391.8653	1495.4415
0.0367	70.6633	73.8669	94.2733	69.134	86.8655	51.794	-8.6507	54.4589	391.7209	1495.5833
0.037	70.6895	73.8881	94.2576	69.1205	86.8884	51.8215	-8.7131	54.2362	391.5778	1495.8977
0.0371	70.6976	73.8672	94.2914	69.1034	86.8944	51.8214	-8.8804	54.0159	391.2507	1497.1246
0.0372	70.6887	73.871	94.2641	69.132	86.8721	51.8734	-8.7832	52.8925	390.4201	1497.2208
0.0373	70.6714	73.8603	94.2134	69.1297	86.8611	51.8704	-8.7017	53.9146	391.8268	1495.2153
0.0375	70.6868	73.8854	94.2875	69.1215	86.8943	51.8222	-8.9005	53.303	392.277	1496.4343
0.0376	70.6902	73.8766	94.2532	69.1455	86.8865	51.6012	-8.9742	53.6848	392.4518	1496.6643
0.0377	70.6654	73.881	94.2729	69.1256	86.8834	51.9616	-8.9776	54.8807	391.7213	1497.7258
0.0379	70.6754	73.8833	94.2519	69.1401	86.8421	51.7326	-8.7654	53.1512	391.4998	1496.3071
0.038	70.7002	73.8671	94.26	69.1401	86.8957	51.8882	-8.7086	53.1758	390.8628	1496.3576
0.0382	70.6804	73.8937	94.2367	69.1263	86.8602	51.7984	-9.0061	54.7912	391.3395	1495.683
0.0383	70.7017	73.8917	94.2934	69.0849	86.8761	51.8093	-8.9377	54.9251	392.3526	1495.9464
0.0384	70.6706	73.8815	94.281	69.132	86.8707	51.7993	-8.8929	54.0736	391.456	1497.6456
0.0386	70.6866	73.8715	94.2961	69.1261	86.8991	52.113	-8.8923	54.6479	392.2751	1497.0846
0.0386	70.71	73.8867	94.3143	69.1241	86.8823	52.1307	-8.7928	53.6212	390.5133	1497.1473
0.0389	70.6936	73.8776	94.2792	69.1253	86.8375	52.0428	-8.6305	54.5791	391.5937	1496.5493
0.039	70.6724	73.8906	94.2957	69.1372	86.9001	52.1281	-8.9508	55.1659	392.6901	1496.12
0.0391	70.6555	73.8812	94.3083	69.1409	86.9138	51.7619	-8.8187	54.4964	391.6715	1497.8219
0.0392	70.6494	73.8823	94.302	69.1581	86.8457	51.8748	-8.6854	54.1337	391.848	1496.005
0.0394	70.6435	73.8922	94.2934	69.1489	86.8609	51.9579	-8.6132	53.4727	391.2451	1494.2873
0.0395	70.6699	73.9076	94.2655	69.1652	86.8673	52.0312	-8.569	54.0454	390.884	1494.142
0.0396	70.6419	73.8932	94.2996	69.1296	86.9204	52.0945	-8.7137	54.7883	391.5829	1495.8022
0.0397	70.6611	73.9276	94.2869	69.1499	86.862	51.8279	-8.8244	54.792	392.4965	1495.722
0.0398	70.6708	73.8761	94.2646	69.1632	86.9055	52.0248	-8.8144	53.4062	393.1056	1497.8941
0.0399	70.6487	73.8889	94.2908	69.1248	86.9121	52.5066	-8.9374	55.0775	392.3564	1497.7606
0.0399	70.6511	73.8769	94.3123	69.145	86.8571	52.0731	-8.5467	54.3153	391.2451	1496.5155
0.04	70.6369	73.882	94.2952	69.1464	86.8898	52.3831	-9.0295	55.9047	391.1594	1495.89
0.0401	70.6582	73.9203	94.2669	69.1398	86.8469	52.1938	-8.9153	53.6636	391.3872	1497.0476
0.0401	70.6575	73.8782	94.277	69.14	86.8723	52.1391	-8.7238	53.6833	392.5519	1496.3632
0.0402	70.6536	73.8766	94.2901	69.1437	86.909	52.3173	-8.9488	54.3706	392.8225	1498.2819
0.0403	70.6621	73.8725	94.3087	69.1465	86.8788	51.9263	-8.6647	54.6331	391.3448	1495.3453
0.0403	70.6555	73.8737	94.2686	69.1243	86.9068	52.5448	-8.9318	54.2716	391.8109	1495.4837
0.0404	70.6613	73.8947	94.2871	69.1451	86.885	51.682	-8.6439	54.7144	392.6793	1498.1105
0.0405	70.6629	73.909	94.3016	69.1419	86.9224	51.7731	-8.5805	54.5481	392.2418	1496.2189
0.0406	70.6509	73.8919	94.3211	69.1361	86.9141	52.2217	-8.6196	53.7314	391.6604	1495.3052
0.0407	70.6802	73.8935	94.2887	69.1422	86.8978	52.1734	-8.4938	54.0383	391.419	1495.2613
0.0408	70.6687	73.9015	94.3054	69.1519	86.905	52.1423	-8.5085	53.0945	390.9158	1494.4947
0.0409	70.6648	73.9025	94.3271	69.1445	86.9315	52.3786	-8.7562	54.3812	391.027	1495.177
0.0411	70.6705	73.9065	94.3515	69.1412	86.9065	51.9468	-8.7154	54.2451	392.2086	1496.9243
0.0412	70.6895	73.9076	94.3194	69.1831	86.9092	52.4551	-8.615	56.184	392.0704	1496.58
0.0412	70.6433	73.8884	94.2906	69.1588	86.8731	52.1752	-8.8448	54.8089	391.9221	1496.4113
0.0414	70.692	73.8998	94.2971	69.1476	86.8773	52.2273	-8.7317	54.1379	392.6184	1495.6258
0.0415	70.6991	73.9223	94.2893	69.1499	86.8745	52.075	-8.756	53.931	390.8188	1494.5999
0.0417	70.6687	73.8918	94.3102	69.1151	86.9145	52.1672	-8.5277	54.6286	391.8639	1495.9973
0.0418	70.6744	73.9103	94.3209	69.1512	86.9063	52.127	-8.7266	55.3611	391.5718	1496.7559
0.042	70.6768	73.912	94.3561	69.1566	86.9048	52.3378	-8.6166	55.0882	392.3194	1497.0706
0.0421	70.6792	73.9151	94.3236	69.1411	86.909	52.2775	-8.6084	54.2562	391.0735	1497.8861

0.0424	70.6894	73.9202	94.3239	69.1235	86.9067	52.3165	-8.7367	55.0212	390.6416	1496.3312
0.0424	70.6763	73.9091	94.2946	69.1335	86.894	52.2658	-8.9817	53.9534	391.3236	1495.4913
0.0425	70.6799	73.9176	94.3544	69.155	86.9226	52.304	-8.891	54.6852	392.3352	1496.8176
0.0426	70.6577	73.9125	94.2846	69.1503	86.918	52.2782	-8.5272	55.0634	391.7261	1497.4079
0.0426	70.6409	73.91	94.3415	69.1337	86.9193	52.3648	-8.8115	54.4483	392.7956	1498.375
0.0427	70.6526	73.9245	94.2988	69.1696	86.9322	52.1992	-8.8244	54.3635	392.902	1498.1439
0.0428	70.6516	73.908	94.3242	69.1596	86.9197	52.6862	-8.8828	54.0123	390.8852	1497.838
0.0429	70.6558	73.9179	94.3161	69.1627	86.8793	52.6088	-8.4315	54.6958	391.8427	1494.3107
0.043	70.6834	73.921	94.3313	69.1731	86.9163	52.2329	-8.5702	55.2329	391.8586	1496.8176
0.0431	70.6493	73.9185	94.3062	69.1568	86.8966	52.6398	-8.7591	55.3427	392.0093	1497.9181
0.0434	70.6588	73.9202	94.3513	69.1589	86.9012	52.6165	-8.6285	53.7055	389.8996	1493.9908
0.0435	70.6634	73.9274	94.3337	69.1718	86.8887	52.3425	-8.4928	54.8475	391.965	1495.9865
0.0438	70.6848	73.931	94.3411	69.1511	86.9087	52.2895	-8.5564	54.744	391.9816	1497.9261
0.0439	70.6807	73.9371	94.3211	69.1616	86.9216	52.2923	-8.6136	54.4336	390.2761	1495.0327
0.044	70.6865	73.9486	94.3513	69.1689	86.9025	52.3671	-8.6168	53.6388	392.134	1495.2
0.0441	70.6848	73.9182	94.3111	69.1617	86.9015	52.5162	-8.6928	53.9346	391.3337	1496.3312
0.0442	70.69	73.9276	94.3148	69.1686	86.8779	52.4346	-8.3955	54.4059	391.3554	1497.4769
0.0443	70.6841	73.9302	94.315	69.1733	86.9257	52.493	-8.6726	54.5592	393.2552	1498.3429
0.0444	70.6865	73.9364	94.3104	69.1789	86.9269	51.9868	-8.3953	54.7311	391.3289	1496.672
0.0444	70.7004	73.9287	94.3478	69.1759	86.9181	52.467	-8.722	54.5888	390.9738	1497.9582
0.0446	70.6807	73.9428	94.3184	69.1968	86.8792	52.6239	-8.6639	54.7311	390.3544	1497.2316
0.0447	70.6986	73.9575	94.3302	69.1759	86.8827	52.4595	-8.7286	54.2155	392.347	1495.6098
0.0448	70.6555	73.9176	94.3505	69.1999	86.9089	52.2498	-8.6957	54.9856	391.652	1497.8833
0.0449	70.6538	73.8915	94.307	69.2024	86.8726	52.3662	-8.9186	54.6251	393.2833	1495.2767
0.045	70.6731	73.9108	94.3363	69.1904	86.9092	52.8896	-8.6783	54.0347	391.562	1496.626
0.0451	70.6851	73.9338	94.3325	69.1859	86.9179	52.885	-8.8699	54.4299	391.3503	1496.6678
0.0452	70.6585	73.9506	94.373	69.1707	86.9408	52.7596	-8.6777	54.6738	392.8842	1496.243
0.0453	70.6493	73.921	94.3674	69.1956	86.9123	52.6017	-8.8477	54.197	390.8907	1495.3934
0.0455	70.6389	73.9328	94.3609	69.1688	86.9218	52.4231	-8.8451	54.8301	391.9539	1494.487
0.0456	70.6562	73.933	94.3636	69.1663	86.9364	52.6528	-8.7841	54.7625	390.6139	1491.8107
0.0456	70.669	73.9356	94.358	69.1862	86.9435	52.3267	-8.7924	54.4446	388.3879	1498.1345
0.0457	70.6506	73.9452	94.364	69.1641	86.952	52.9965	-9.1641	54.6035	393.7978	1496.4193
0.0458	70.6394	73.9479	94.3882	69.1598	86.908	52.5181	-8.823	55.5689	392.7431	1495.4223
0.0459	70.6478	73.9373	94.3735	69.1916	86.9286	52.663	-8.7839	54.8622	392.0536	1498.0063
0.046	70.6792	73.9151	94.3699	69.193	86.9477	52.6184	-9.1693	55.3279	391.2839	1498.2868
0.046	70.656	73.9279	94.36	69.1875	86.9015	52.3484	-9.4586	53.7908	389.3162	1497.6149
0.0461	70.67	73.9391	94.3517	69.2002	86.9396	52.6518	-9.043	54.5888	391.4168	1495.9785
0.0464	70.6522	73.9544	94.3552	69.2115	86.9077	52.3369	-8.8563	55.4572	391.9317	1497.9502
0.0465	70.6537	73.9457	94.3703	69.1858	86.9406	52.9249	-8.8624	54.6183	391.7656	1493.9988
0.0465	70.6854	73.9595	94.3853	69.1704	86.9202	52.7512	-8.7433	53.8053	390.337	1495.8663
0.0467	70.6643	73.9289	94.3983	69.1603	86.9424	52.719	-8.8246	54.6746	392.1658	1496.1046
0.0469	70.6949	73.913	94.364	69.1989	86.9468	52.8629	-8.4994	54.7665	392.473	1495.1003
0.047	70.6782	73.9524	94.3967	69.1998	86.962	52.8302	-8.8815	54.8327	389.739	1496.9884
0.0471	70.687	73.9589	94.3751	69.1637	86.9506	52.4586	-8.974	55.2922	391.848	1495.315
0.0472	70.677	73.9513	94.3783	69.1816	86.949	52.6594	-8.9091	55.8234	390.937	1494.4717
0.0472	70.6902	73.9465	94.3522	69.1982	86.9275	52.3731	-8.6865	54.4742	392.9395	1498.4872
0.0473	70.6889	73.9478	94.3312	69.2	86.9293	52.7206	-8.7198	55.8564	392.1588	1497.1727
0.0474	70.6785	73.9357	94.3588	69.179	86.9197	52.695	-8.9283	53.3808	390.8469	1497.8909
0.0475	70.7244	73.9376	94.3783	69.1644	86.9392	52.8682	-8.6219	53.8934	391.1065	1497.7376
0.0476	70.71	73.9501	94.3817	69.2046	86.9257	52.7892	-8.6688	55.9542	392.6107	1493.2987
0.0476	70.7111	73.9317	94.3868	69.1948	86.9394	52.819	-8.8317	55.4277	390.9904	1496.1628
0.0477	70.6946	73.9611	94.3802	69.1907	86.9607	52.8729	-8.8021	54.8659	391.3503	1497.6536
0.0479	70.7098	73.9694	94.3817	69.1948	86.9766	52.5261	-8.5773	54.2327	391.3713	1497.3773

0.048	70.7207	73.9608	94.3633	69.186	86.9097	52.7705	-8.7142	56.5375	390.2802	1494.8857
0.0481	70.7163	73.9751	94.4091	69.2021	86.9212	52.5543	-8.7959	55.387	393.2552	1496.1148
0.0481	70.7014	73.9654	94.3959	69.2091	86.9637	52.6463	-8.8536	55.5053	391.3503	1497.6697
0.0482	70.6979	73.9746	94.3782	69.2066	86.9333	52.9472	-8.8765	54.877	391.0735	1495.7942
0.0483	70.7022	73.9569	94.3734	69.1913	86.9538	52.6576	-8.6129	54.2504	390.7463	1496.948
0.0484	70.7106	73.9567	94.3721	69.2234	86.9475	52.5487	-8.6332	54.3633	390.708	1497.4773
0.0484	70.6736	73.9605	94.3853	69.1831	86.9556	52.7178	-8.684	54.8548	392.5021	1495.4175
0.0487	70.7127	73.9741	94.4358	69.1703	86.9784	53.0085	-8.5053	54.282	391.4722	1496.8201
0.0488	70.7017	73.9613	94.4046	69.1984	86.9947	52.6559	-8.6296	54.8584	390.6721	1495.6293
0.0488	70.6738	73.9555	94.425	69.1872	86.9158	52.7243	-8.6059	55.7775	390.7198	1498.2743
0.0489	70.6846	73.9562	94.4828	69.1974	86.9951	52.6546	-8.6389	55.8748	392.7568	1497.5574
0.049	70.6688	73.9608	94.4436	69.2063	86.9787	52.7317	-8.6136	55.8416	390.8409	1497.8219
0.049	70.6608	73.9631	94.3643	69.2079	86.9447	52.8404	-8.7227	53.676	390.5031	1496.804
0.0492	70.6657	73.9705	94.4143	69.2022	86.9467	52.9249	-8.79	55.3353	391.6604	1495.1209
0.0494	70.6634	73.9809	94.3944	69.2153	86.9141	52.8915	-8.674	54.8733	390.7634	1496.4674
0.0496	70.648	73.9784	94.3981	69.2041	86.9397	52.9304	-8.8379	56.0921	392.3511	1495.913
0.0497	70.6675	73.9662	94.4058	69.2168	86.9863	52.7341	-8.6041	54.968	392.2399	1495.6293
0.0498	70.6726	73.9786	94.3931	69.2185	86.9444	52.7803	-8.7523	54.9715	389.6128	1498.0443
0.0499	70.6631	73.9569	94.3909	69.1723	86.9664	53.1686	-8.5588	55.1518	391.2071	1494.9317
0.05	70.6565	73.9601	94.3675	69.2244	86.9575	52.4782	-8.456	55.325	391.8056	1496.0586
0.0501	70.6591	73.9868	94.4019	69.2102	86.9445	52.5227	-8.6327	55.2835	391.6106	1496.4594
0.0502	70.6665	73.9815	94.4063	69.2018	86.9666	52.9556	-8.8929	54.4077	390.1931	1495.9064
0.0503	70.6472	73.9923	94.425	69.2068	86.9861	52.6808	-8.5637	55.7209	391.6202	1494.3337
0.0504	70.6406	73.9711	94.4344	69.2187	87.0052	52.9873	-8.8138	56.693	392.6848	1497.6609
0.0505	70.6435	73.9738	94.3906	69.1808	86.9508	53.1089	-8.8727	54.8918	391.5165	1496.2029
0.0506	70.6468	73.9873	94.3767	69.1974	86.9673	53.0884	-8.9313	54.1786	389.9328	1496.3632
0.0507	70.6665	73.9815	94.4323	69.1693	86.9495	52.4289	-8.7689	55.1135	392.2806	1494.6961
0.0508	70.6575	73.9635	94.3949	69.2449	86.9511	52.6852	-8.9432	55.3603	391.7579	1498.4276
0.0509	70.6558	73.952	94.4275	69.2118	86.9498	52.8976	-8.6006	53.9711	390.9582	1495.7443
0.051	70.6713	73.9761	94.4217	69.2353	86.9566	52.7661	-8.856	54.4225	389.5673	1495.5938
0.051	70.6552	73.9932	94.4165	69.1994	86.9515	52.7039	-8.7003	55.2946	392.0646	1495.3694
0.0511	70.6445	73.9723	94.3997	69.2053	86.932	52.6388	-8.597	54.9029	392.0646	1496.1628
0.0512	70.6655	73.9789	94.4029	69.2187	86.9615	53.2148	-8.5966	55.2437	391.2124	1494.9317
0.0513	70.6621	73.9828	94.4322	69.2459	86.9666	52.8016	-8.6398	55.0917	389.4328	1498.5886
0.0514	70.6637	73.9659	94.4102	69.2134	86.9806	53.2241	-8.7959	55.9561	392.5187	1495.2892
0.0515	70.6668	73.9777	94.3577	69.2488	86.9283	53.1339	-8.6347	55.0669	391.3501	1496.7256
0.0516	70.6382	73.9784	94.4523	69.1904	87.0183	53.1064	-8.4762	56.1734	391.313	1495.3533
0.0517	70.678	73.9718	94.4339	69.2158	86.9998	52.8585	-8.7448	54.618	390.5503	1494.1037
0.0518	70.6797	74.0024	94.4598	69.2176	86.9696	52.7531	-8.7512	55.7566	391.6826	1496.1067
0.052	70.6606	73.9705	94.4184	69.2345	87.037	52.7336	-8.8157	53.3544	390.4533	1496.4915
0.0521	70.6709	73.972	94.4014	69.2123	86.9576	53.1783	-8.6119	56.3077	391.5726	1495.5833
0.0522	70.6802	73.9886	94.4107	69.2437	86.9911	52.8469	-8.4832	54.8513	391.3289	1497.4309
0.0522	70.7058	73.9621	94.4213	69.2349	86.9588	53.2947	-8.8277	55.5792	391.7546	1496.6117
0.0524	70.6868	74.0001	94.4551	69.2251	86.9727	52.8283	-8.933	54.922	390.5927	1496.0433
0.0524	70.6707	73.9962	94.4346	69.2116	86.9545	53.1161	-8.9882	56.2193	391.8268	1496.1966
0.0525	70.7073	73.9942	94.3627	69.2242	86.9659	53.1646	-8.8743	54.1157	392.1145	1497.5414
0.0526	70.7043	73.9733	94.3612	69.2482	86.934	52.937	-8.828	54.5333	390.265	1496.6037
0.0527	70.6734	73.9916	94.3828	69.2595	86.9365	53.0726	-8.5581	55.5724	391.2865	1496.672
0.0528	70.6897	73.9843	94.4302	69.2618	86.9728	52.6992	-8.8892	55.3759	390.4644	1497.4693
0.053	70.7129	74.0024	94.433	69.2314	86.9756	52.8525	-8.6645	54.6775	391.821	1497.2048
0.053	70.7171	73.9889	94.4018	69.2469	86.9652	53.1526	-9.1225	54.5438	391.3183	1497.4999
0.0531	70.6915	73.9963	94.4222	69.2306	86.9647	53.1507	-8.8062	55.5718	391.6327	1496.1468
0.0533	70.6555	73.9859	94.4351	69.2121	86.9938	53.1997	-8.5824	54.9362	390.8152	1496.994

0.0535	70.6552	73.983	94.4206	69.2137	86.9708	53.238	-8.9771	55.8305	391.6383	1495.2972
0.0537	70.6575	73.9904	94.4204	69.2314	86.9858	52.7181	-8.6968	54.7181	390.4035	1498.0063
0.0538	70.6619	73.9899	94.3819	69.239	86.9817	53.0673	-8.6806	54.9079	390.9582	1497.201
0.0538	70.6695	74.0177	94.4593	69.2529	87.0071	53.1367	-8.7808	55.0766	391.6549	1494.2312
0.0539	70.6665	74.0018	94.4836	69.2222	87.0086	53.0806	-8.83	56.1133	390.3173	1498.0749
0.054	70.6683	74.0164	94.4259	69.2651	86.9457	52.937	-8.7474	56.6916	391.5054	1497.341
0.054	70.6511	73.9866	94.4525	69.2767	86.985	53.343	-8.799	54.489	389.9383	1497.7498
0.0541	70.6453	73.9928	94.4536	69.2334	86.9882	53.0966	-8.8037	56.0284	391.6732	1498.2359
0.0543	70.6774	73.9822	94.4403	69.2234	87.0007	53.2027	-8.8852	55.3094	391.0347	1510.7501
0.0544	70.6731	74.0108	94.444	69.2627	86.9954	53.2521	-8.742	53.5646	389.6923	1514.0826
0.0544	70.6601	74.0108	94.4529	69.1902	86.9981	53.251	-8.9469	56.0744	392.2806	1517.9475
0.0545	70.6703	74.0006	94.5101	69.2276	87.0175	53.2101	-8.7946	56.6657	391.2396	1528.3028
0.0547	70.656	73.994	94.4466	69.2452	86.9969	53.0531	-9.0107	55.6827	389.8221	1536.6945
0.0548	70.6688	73.9965	94.4636	69.2394	86.9936	53.1841	-9.2839	56.1594	391.6051	1545.4789
0.0549	70.6511	73.9866	94.4375	73.9866	86.9928	53.1674	-9.028	55.1468	391.4168	1548.4605
0.0549	70.7032	73.9921	94.493	69.2366	87.0228	53.1339	-8.8852	54.056	390.8681	1547.1788
0.055	70.7007	74.0156	94.4853	69.228	87.0204	52.9797	-8.6125	55.3353	391.3282	1565.3801
0.0551	70.6833	74.0263	94.4899	69.2199	87.0225	53.1089	-8.7665	55.9081	392.3027	1566.5262
0.0553	70.6721	74.0228	94.4895	69.2196	87.0298	53.2556	-8.9089	56.0855	390.7579	1580.2077
0.0554	70.7137	74.0172	94.4873	69.2332	87.0122	53.1233	-8.7003	55.3285	390.937	1583.4336
0.0556	70.6912	74.0113	94.5156	69.1948	87.0432	53.2752	-8.9032	55.6716	391.0403	1599.1231
0.0559	70.7085	74.0243	94.5221	69.2121	87.0592	52.8265	-8.8332	55.2861	389.0037	1622.5097
0.056	70.6859	74.0213	94.5345	69.1551	87.0445	53.5278	-8.7961	55.4092	390.7911	1633.0905
0.0561	70.6922	74.025	94.5257	69.184	87.0434	53.0637	-8.6657	55.12	391.4242	1634.8067
0.0562	70.6587	74.0257	94.5614	69.1957	87.0405	52.9562	-8.8717	55.6643	390.9423	1651.627
0.0564	70.67	74.0258	94.5784	69.1741	87.048	53.8269	-8.8833	56.2703	392.2252	1654.0256
0.0565	70.6757	74.0264	94.5495	69.1856	87.0468	53.0866	-8.9317	55.7455	391.223	1652.5989
0.0566	70.7015	74.0221	94.5377	69.1864	87.041	52.8931	-8.8007	56.0921	392.5312	1663.0731
0.0567	70.6829	74.0157	94.5377	69.1987	87.0434	53.6617	-8.6233	56.5834	392.42	1666.5766
0.0567	70.6849	74.025	94.5595	69.2084	87.0531	53.5657	-8.8138	55.3427	389.4434	1667.1286
0.0568	70.692	74.0274	94.6	69.1831	87.0874	53.1479	-8.6924	54.6738	390.6969	1669.0536
0.0569	70.6807	74.0355	94.5523	69.2011	87.0774	53.7977	-9.1452	55.4629	390.7728	1685.9499
0.057	70.6769	74.0225	94.5482	69.1869	87.0683	53.0336	-8.788	55.7011	392.6682	1684.0576
0.0571	70.669	74.0262	94.5493	69.2055	87.0599	53.03	-8.4837	54.4908	388.7071	1686.1262
0.0572	70.6759	74.0496	94.5697	69.1908	87.057	53.5631	-8.586	55.3205	391.7435	1698.3082
0.0574	70.6675	74.0199	94.5865	69.1527	87.0585	53.2379	-8.6493	54.9927	391.0376	1702.7701
0.0577	70.678	74.0261	94.6093	69.1772	87.0967	53.0104	-8.7099	54.9398	390.0103	1724.974
0.0577	70.6682	73.9987	94.6265	69.1613	87.067	53.2841	-8.6402	56.2724	391.313	1736.426
0.0578	70.6606	73.9935	94.603	69.1784	87.0878	53.1665	-8.6207	54.8438	391.6826	1736.1309
0.0579	70.6712	74.0309	94.5788	69.1962	87.0846	53.4653	-8.6254	55.1094	389.1838	1735.621
0.058	70.6687	74.0382	94.6192	69.1661	87.0839	53.1339	-8.5952	54.7629	390.6774	1743.6555
0.0581	70.6703	74.0389	94.5853	69.2014	87.0802	53.2733	-8.5176	56.3257	390.7136	1753.0024
0.0582	70.6726	74.0309	94.6639	69.1276	87.111	53.068	-8.606	53.894	390.1986	1753.7237
0.0582	70.6851	74.0179	94.6242	69.1272	87.1181	53.1001	-8.6061	56.0815	392.6266	1763.6881
0.0584	70.6946	74.0554	94.6793	69.138	87.134	53.1544	-8.5818	54.9694	391.295	1770.1864
0.0585	70.7109	74.0488	94.6467	69.1383	87.1241	53.173	-8.5233	55.0248	389.9716	1771.004
0.0585	70.7051	74.033	94.6928	69.1673	87.1312	53.253	-8.639	55.5583	391.1276	1784.5562
0.0588	70.6963	74.0365	94.6588	69.1402	87.0776	53.5329	-8.4096	54.2716	390.2431	1787.2012
0.0588	70.6993	74.0492	94.6883	69.1603	87.0927	53.4405	-8.3836	55.2437	390.8046	1792.997
0.059	70.7076	74.0429	94.6379	69.1601	87.0823	53.5241	-8.527	55.8896	390.7745	1804.8031
0.059	70.7108	74.0484	94.6375	69.1431	87.1241	53.2432	-8.7794	55.4098	390.4391	1803.3238
0.0591	70.7149	74.0501	94.66	69.1488	87.1249	53.2165	-8.5519	55.8764	391.4401	1807.1877
0.0592	70.681	74.0598	94.6676	69.1314	87.1654	53.1247	-8.5439	55.1727	392.6571	1823.8787

0.0593	70.6946	74.0631	94.6729	69.1495	87.1402	53.3523	-8.629	55.7085	391.3614	1823.8707
0.0594	70.7039	74.0562	94.6991	69.1223	87.1471	53.3587	-8.5876	56.0143	392.4888	1819.7914
0.0595	70.6925	74.0253	94.6868	69.1533	87.1187	53.3105	-8.5674	54.5038	391.295	1839.1472
0.0596	70.6805	74.0567	94.6949	69.1258	87.1345	53.2334	-8.4901	56.4033	391.4223	1839.043
0.0597	70.6851	74.0521	94.6837	69.1385	87.1486	53.269	-8.5238	55.9825	391.0906	1838.444
0.0598	70.69	74.0457	94.678	69.1445	87.1251	53.3188	-8.4206	55.3131	390.0712	1857.9423
0.0599	70.6846	74.0687	94.7069	69.1327	87.1647	53.2716	-8.5011	56.5021	391.2495	1856.4602
0.0599	70.6739	74.0482	94.7143	69.1377	87.143	52.7385	-8.2858	55.4558	391.2601	1856.3376
0.06	70.6553	74.0711	94.702	69.1033	87.1549	53.1464	-8.5015	55.3215	389.9889	1855.7549
0.0602	70.6643	74.0728	94.7221	69.0942	87.1702	53.0566	-8.5531	55.0846	391.742	1871.4176
0.0603	70.668	74.0697	94.7484	69.0802	87.178	53.2194	-8.2839	53.5725	391.5829	1874.1646
0.0604	70.6753	74.0545	94.7197	69.104	87.1629	53.3623	-8.4809	56.2971	390.063	1886.8425
0.0605	70.6719	74.0659	94.7007	69.1214	87.1377	53.2686	-8.4649	55.7344	390.2207	1891.4689
0.0606	70.6537	74.0784	94.7755	69.1076	87.1773	53.1191	-8.7437	55.6642	393.0004	1897.7046
0.0607	70.658	74.0714	94.7378	69.1175	87.1569	53.2379	-8.4825	55.986	390.0472	1909.037
0.0608	70.6641	74.075	94.7501	69.1421	87.1643	53.2388	-8.4046	55.1836	390.5133	1907.4117
0.0609	70.6604	74.0442	94.7315	69.15	87.1509	53.1813	-8.6919	55.5274	392.3581	1916.8203
0.061	70.6805	74.0767	94.7588	69.0898	87.1683	53.2787	-8.5252	54.5438	390.1478	1926.601
0.0611	70.6925	74.0687	94.7252	69.1155	87.18	52.9816	-8.9028	55.8342	392.2917	1925.6047
0.0612	70.6974	74.0786	94.7787	69.1211	87.216	53.3151	-8.5239	55.8157	391.4223	1927.6004
0.0612	70.68	74.0567	94.7351	69.1172	87.2196	53.2876	-8.5495	55.4098	390.7092	1940.278
0.0613	70.6841	74.0679	94.7223	69.0947	87.2126	53.0977	-8.6042	56.7137	391.3669	1939.8312
0.0614	70.6856	74.0745	94.7632	69.1089	87.1896	53.1828	-8.485	55.0104	391.3766	1940.876
0.0615	70.7076	74.0531	94.7863	69.1288	87.216	53.4582	-8.5992	55.9894	391.1842	1943.2216
0.0616	70.668	74.0799	94.752	69.1068	87.2297	53.4294	-8.3605	55.6457	391.4998	1958.7546
0.0617	70.701	74.0491	94.7972	69.0785	87.2092	52.7494	-8.2837	55.6716	391.8099	1960.4538
0.0618	70.693	74.0514	94.7265	69.1475	87.194	53.2696	-8.3444	55.1801	390.3979	1958.4019
0.0619	70.7025	74.0743	94.7968	69.1038	87.2112	53.5098	-8.2271	56.1274	391.6626	1974.7925
0.062	70.7125	74.0912	94.7947	69.1194	87.227	53.5092	-8.4392	54.622	390.6416	1977.5417
0.0621	70.7037	74.0779	94.8131	69.0812	87.2227	53.3036	-8.4187	56.3537	391.1382	1977.4528
0.0622	70.7015	74.0725	94.8076	69.1043	87.2297	52.6091	-8.0955	55.6531	392.4024	1992.2091
0.0622	70.6861	74.0726	94.7523	69.1223	87.2077	53.0131	-8.2978	54.7735	390.7251	1992.9851
0.0623	70.6987	74.0621	94.7916	69.1111	87.2112	53.1553	-8.4565	56.285	391.3116	1992.8102
0.0624	70.6956	74.0553	94.7762	69.1099	87.2245	53.2663	-8.3482	55.021	391.2601	1999.2793
0.0625	70.7204	74.0812	94.7573	69.1352	87.2325	53.5994	-8.2892	55.557	389.4234	2012.8476
0.0626	70.7354	74.0779	94.7784	69.1097	87.2243	53.1259	-8.2069	55.675	390.7039	2010.1121
0.0627	70.7261	74.1004	94.8525	69.1015	87.2477	53.1597	-8.2419	55.5053	390.9846	2019.2659
0.0628	70.7117	74.098	94.8623	69.1086	87.2416	53.1711	-8.3082	55.6235	392.2529	2029.2222
0.063	70.6938	74.098	94.8543	69.1157	87.2816	53.2129	-8.3644	55.4277	390.7357	2026.8257
0.063	70.7027	74.0867	94.8685	69.1104	87.2759	53.1304	-8.4829	56.0991	391.991	2027.377
0.0631	70.7027	74.0891	94.8742	69.1027	87.2459	53.3337	-8.668	54.3042	391.306	2044.3304
0.0632	70.7127	74.0821	94.8616	69.0912	87.2883	53.2041	-8.5037	55.5265	391.7103	2045.3473
0.0634	70.692	74.0882	94.89	69.1125	87.2829	53.2636	-8.521	54.6993	389.1256	2045.2169
0.0634	70.7004	74.0741	94.9118	69.0922	87.2963	53.0067	-8.4511	55.5238	390.8243	2058.6532
0.0635	70.6812	74.1092	94.8798	69.068	87.2872	53.0939	-8.4398	55.6502	391.4031	2063.6548
0.0636	70.6887	74.0955	94.8434	69.0817	87.2124	52.9175	-8.4552	56.5807	392.9728	2061.0657
0.0638	70.638	74.105	94.8847	69.0631	87.2581	52.9411	-8.5384	55.3531	391.7156	2063.8925
0.0638	70.6701	74.0896	94.9071	69.0874	87.2814	53.1507	-8.2565	54.3486	390.9295	2078.6986
0.0639	70.6929	74.094	94.8558	69.0633	87.2874	53.1401	-8.5076	55.2472	390.3544	2078.2519
0.064	70.6752	74.0922	94.9053	69.0574	87.2897	53.0903	-8.2437	55.3131	390.8797	2081.039
0.0641	70.6762	74.0804	94.9052	69.0701	87.2897	53.1061	-8.3412	56.2887	391.2673	2086.0243
0.0643	70.6772	74.1044	94.881	69.0866	87.2527	53.2185	-8.2929	54.6922	390.6416	2097.9986
0.0644	70.6783	74.1136	94.9139	69.0805	87.2923	53.1224	-8.2257	56.5233	391.4348	2097.3721

0.0645	70.68	74.12	94.9929	69.072	87.3396	53.042	-8.2813	54.8438	389.8553	2099.3612
0.0646	70.6631	74.0911	94.9851	69.0842	87.3177	53.1233	-8.2994	55.4346	391.9698	2112.9581
0.0647	70.6724	74.0919	94.9737	69.0807	87.2976	53.1284	-8.3229	53.9568	390.2761	2115.0465
0.0648	70.6851	74.0894	94.9851	69.0846	87.3014	53.1024	-8.3045	55.7677	390.5973	2115.5514
0.0649	70.656	74.1113	95.0275	69.0738	87.3059	53.2027	-8.2732	54.0973	389.739	2129.9864
0.065	70.6813	74.1136	95.0164	69.0707	87.3151	52.9983	-8.1426	55.8342	391.1399	2133.2325
0.0651	70.6878	74.0962	95.0059	69.0734	87.2877	52.95	-8.2306	55.675	390.1531	2127.0951
0.0652	70.6924	74.1131	95.0102	69.0655	87.3478	53.0673	-8.2957	56.7496	390.312	2146.8976
0.0653	70.6767	74.1109	95.0371	69.0452	87.3409	52.9277	-8.4096	54.5518	390.481	2150.0479
0.0654	70.6922	74.1275	94.9892	69.0981	87.2831	53.0708	-8.3978	56.1345	391.4242	2148.5766
0.0655	70.6949	74.1155	95.0591	69.0587	87.3289	53.1419	-8.3342	55.8305	390.1319	2167.5818
0.0656	70.6749	74.1149	95.0361	69.0979	87.3247	53.0531	-8.2075	57.0242	391.3891	2166.0458
0.0657	70.7076	74.1038	95.0349	69.0758	87.3324	53.141	-8.2862	55.5972	391.027	2165.4889
0.0659	70.6974	74.1118	95.1796	69.0411	87.3546	52.1614	-7.7839	54.8881	389.2296	2180.5128
0.066	70.6954	74.1404	95.0929	69.0343	87.358	53.0077	-8.2268	56.5728	391.2918	2182.4012
0.0661	70.7056	74.1149	95.0879	69.0147	87.3893	52.976	-8.2852	55.3242	391.1178	2199.909
0.0662	70.6966	74.1136	95.1051	69.022	87.361	52.8348	-8.1453	54.8475	389.7999	2198.8831
0.0662	70.7103	74.1309	95.1066	69.0604	87.3645	53.3152	-8.3531	56.191	390.0578	2201.1994
0.0663	70.6951	74.1044	95.1293	69.0414	87.3296	53.1377	-8.4203	55.3242	390.409	2199.4121
0.0664	70.6954	74.1136	95.1757	69.0251	87.3926	52.9598	-8.0972	55.226	389.9836	2209.0422
0.0665	70.6874	74.1121	95.1113	69.0743	87.3596	53.1739	-8.2045	56.1298	391.2784	2217.574
0.0665	70.7051	74.0892	95.1279	69.0526	87.3519	52.9384	-8.1876	55.2331	390.7092	2215.4361
0.0667	70.7142	74.1177	95.1688	69.0378	87.3736	52.9384	-8.3458	54.4201	390.2961	2229.2435
0.0669	70.6934	74.1287	95.1373	69.0401	87.3977	52.607	-8.1623	55.7174	391.6944	2235.507
0.067	70.6959	74.1179	95.1265	69.0487	87.3748	52.7893	-8.1799	56.6435	391.1731	2234.0528
0.0671	70.6829	74.128	95.1291	69.0587	87.3579	52.9562	-8.0455	56.0603	391.7367	2251.875
0.0672	70.7071	74.1301	95.1349	69.0303	87.3517	52.9873	-8.3067	55.6396	391.6573	2250.8783
0.0674	70.6868	74.1294	95.1863	69.0384	87.4081	52.9535	-8.3255	55.7244	390.6298	2266.242
0.0674	70.6864	74.1212	95.1836	69.0579	87.4068	52.8293	-8.1369	56.3146	392.0259	2267.6035
0.0675	70.6757	74.1539	95.1828	69.0418	87.4364	52.8804	-8.106	54.877	390.5807	2267.6596
0.0676	70.7008	74.1141	95.1095	69.0437	87.394	52.9695	-8.061	55.6396	390.8204	2283.3613
0.0679	70.6795	74.1221	95.2262	69.0298	87.4166	52.7314	-8.1775	56.29	392.6001	2304.6588
0.068	70.678	74.123	95.2719	69.0118	87.4396	52.9612	-8.0785	55.6346	390.2041	2301.587
0.068	70.6929	74.1599	95.2494	68.9897	87.4205	52.6941	-8.0193	54.968	390.7198	2303.9228
0.0681	70.6878	74.1133	95.2612	69.0213	87.4348	52.6239	-8.1259	56.2511	389.9147	2319.9688
0.0682	70.6758	74.1453	95.2332	68.9978	87.4091	52.6257	-8.0438	55.2296	391.223	2320.3828
0.0683	70.6777	74.1687	95.2477	69.0359	87.423	52.3425	-7.8927	56.784	390.4256	2319.9412
0.0683	70.7173	74.1368	95.2232	69.0443	87.4034	52.5153	-8.0608	54.5444	390.5031	2318.7069
0.0684	70.6841	74.1394	95.2414	69.0014	87.4496	52.232	-7.9289	55.387	390.8907	2330.521
0.0685	70.6878	74.1304	95.2291	69.0328	87.4074	52.4124	-8.0004	55.4947	392.1446	2335.4628
0.0685	70.6766	74.1484	95.2131	69.0264	87.4301	52.2036	-7.9529	55.8093	391.6043	2338.813
0.0686	70.6923	74.1322	95.2131	69.0418	87.3908	52.2496	-8.1003	55.5903	389.9217	2337.9749
0.0688	70.6882	74.1332	95.203	69.0316	87.4111	52.5515	-8.1365	56.0153	390.4976	2352.3538
0.0689	70.7076	74.1209	95.1743	69.0726	87.3742	52.4169	-8.028	55.1482	389.1732	2353.755
0.069	70.69	74.1326	95.1699	69.0437	87.4207	52.519	-8.0824	56.1451	391.3236	2354.008
0.069	70.6961	74.1411	95.227	69.0453	87.4319	52.4089	-8.1364	55.0775	389.1362	2356.124
0.0691	70.7107	74.1378	95.1696	69.037	87.4156	52.5413	-8.0586	55.2946	390.636	2367.7105
0.0692	70.68	74.1608	95.1818	69.0613	87.4278	52.44	-8.3447	56.0374	390.7246	2372.263
0.0693	70.7054	74.1504	95.1494	69.0866	87.371	52.36	-8.1232	55.021	391.6732	2371.5183
0.0694	70.7071	74.1424	95.1378	69.0455	87.3958	52.6719	-8.203	55.9754	391.8745	2386.6826
0.0694	70.6977	74.1707	95.1239	69.1075	87.3976	52.3954	-8.1821	55.5501	390.9627	2390.3528
0.0697	70.7044	74.1519	94.9489	69.1722	87.2862	52.6834	-8.0417	56.9758	391.8109	2404.7679
0.0698	70.6762	74.1468	94.9136	69.2065	87.255	51.9421	-8.0762	55.0101	389.3569	2405.3568

0.0699	70.7003	74.1502	94.888	69.2035	87.23	52.3369	-7.9322	55.5512	391.6573	2407.8345
0.07	70.679	74.1649	94.8608	69.2195	87.164	52.179	-8.2076	56.2222	390.9184	2421.8036
0.0701	70.6964	74.1694	94.8846	69.2334	87.1397	52.5654	-8.29	55.132	390.8852	2424.3042
0.0702	70.6966	74.1733	94.8621	69.2775	87.0949	53.1064	-8.0171	56.184	391.5037	2439.8881
0.0703	70.6951	74.1427	94.8252	69.3088	87.06	52.466	-8.0309	55.4166	390.1045	2442.394
0.0704	70.6846	74.1492	94.8252	69.3135	87.0434	52.0028	-8.1582	55.6007	392.1499	2442.5561
0.0705	70.6749	74.1565	94.8483	69.2783	87.0133	52.2756	-8.0418	55.1376	390.6721	2455.3361
0.0706	70.6542	74.1631	94.8815	69.3402	86.9846	51.2203	-8.2137	56.1114	389.6449	2458.3599
0.0707	70.6587	74.1575	94.8967	69.3345	86.9478	52.8904	-8.2605	55.1482	390.9687	2456.9001
0.0708	70.6816	74.1547	94.8843	69.2919	86.9469	52.7271	-8.0614	56.4366	391.6106	2462.9284
0.0709	70.6917	74.1733	94.9165	69.3081	86.9144	51.9939	-8.2851	56.2193	391.08	2473.5287
0.071	70.6717	74.1728	94.9685	69.3241	86.935	52.1769	-8.2006	56.2441	390.3014	2476.3347
0.0713	70.7007	74.1891	95.0605	69.2709	86.9033	51.2361	-8.2328	54.3153	391.4112	2490.0992
0.0714	70.6775	74.1616	95.097	69.283	86.8967	51.714	-8.3331	56.0885	391.7156	2492.8636
0.0715	70.7102	74.1297	94.9959	69.3256	86.8536	52.3843	-8.0755	56.6842	391.0956	2492.8633
0.0716	70.7189	74.1664	95.0047	69.3218	86.8523	51.4563	-7.928	55.4609	389.3902	2490.0992
0.0717	70.6856	74.1624	94.9851	69.3067	86.8427	52.5217	-8.1282	56.3501	391.4084	2509.2316
0.0718	70.6976	74.1621	95.0143	69.3363	86.8478	51.1613	-8.0447	55.5159	389.6287	2509.6686
0.0719	70.7042	74.1711	95.0022	69.368	86.8477	52.296	-7.9285	56.2087	390.8469	2508.6873
0.072	70.7099	74.1702	95.0459	69.3481	86.8278	51.7359	-8.1782	56.0448	390.8907	2501.1598
0.0721	70.7153	74.1552	95.0149	69.3397	86.8169	52.0787	-7.8339	55.6235	390.8907	2491.7823
0.0722	70.7155	74.1911	95.1315	69.3044	86.863	51.8994	-7.8442	55.8859	390.5198	2490.9327
0.0723	70.6854	74.1789	95.0077	69.3632	86.7363	51.4591	-7.7857	56.7433	390.9683	2491.069
0.0724	70.6885	74.1692	95.057	69.3594	86.811	50.8274	-7.4579	56.1298	391.0181	2472.6987
0.0725	70.6576	74.1715	95.0187	69.3691	86.7802	51.7461	-8.0351	56.1557	391.8653	2472.4582
0.0726	70.6876	74.157	95.0305	69.3747	86.767	52.6461	-7.7469	57.2727	390.8204	2473.9044
0.0726	70.6931	74.1738	95.006	69.4023	86.7599	52.2236	-7.6786	55.3242	390.0546	2457.7107
0.0727	70.6749	74.157	94.9929	69.4172	86.7196	52.2729	-7.8851	55.9507	391.7632	2458.8167
0.0728	70.6744	74.1804	95.0271	69.3933	86.7734	51.7247	-7.4263	55.3321	390.2749	2453.2278
0.0728	70.6933	74.1868	95.0325	69.3729	86.7611	52.7243	-7.9766	56.0929	391.079	2442.4742
0.0729	70.6749	74.1589	95.0262	69.3972	86.7481	51.9077	-7.5636	55.4629	391.1435	2438.8532
0.073	70.6816	74.1649	95.0252	69.3604	86.7157	50.9742	-7.4288	56.6805	390.9572	2441.1597
0.0731	70.657	74.1924	95.0508	69.3977	86.7705	52.7216	-7.6297	55.0175	389.9359	2433.1876
0.0731	70.677	74.1705	95.105	69.385	86.8339	51.9635	-7.4553	52.7262	389.4012	2423.6149
0.0732	70.6619	74.168	95.0825	69.3906	86.778	51.5789	-7.6718	55.6502	390.8734	2424.0492
0.0733	70.6642	74.1807	95.0494	69.3798	86.7502	52.0536	-7.7776	56.71	390.8797	2422.6852
0.0733	70.6611	74.1674	95.06	69.3573	86.7786	52.493	-7.8686	56.2259	391.1731	2419.9842
0.0735	70.6915	74.1978	95.0919	69.3666	86.7624	51.878	-7.6856	55.6974	389.955	2422.6612
0.0736	70.6854	74.1585	95.0893	69.3818	86.7548	51.5492	-7.8561	56.7433	392.1311	2421.6192
0.0736	70.7201	74.1651	95.1037	69.3964	86.7743	51.3355	-7.8377	56.1261	390.3204	2422.7974
0.0738	70.6828	74.1967	95.0759	69.3913	86.7818	52.1195	-7.9346	56.4513	391.3116	2421.2024
0.074	70.7429	74.1776	95.0719	69.3872	86.7525	51.7173	-7.7095	54.7994	390.6526	2421.9078
0.074	70.7149	74.1428	95.0518	69.4255	86.7496	51.69	-8.3022	56.435	391.3819	2422.9835
0.0741	70.7125	74.16	95.0166	69.4232	86.7502	52.3462	-8.4563	55.3833	390.4422	2422.8455
0.0742	70.6959	74.174	95.0115	69.4156	86.7299	51.7387	-8.2207	57.172	390.6748	2420.97
0.0742	70.6954	74.2014	95.0372	69.428	86.7326	51.7193	-8.1909	56.3006	390.4656	2420.3922
0.0744	70.6961	74.1948	95.0489	69.3982	86.7467	52.4151	-7.7518	56.6152	390.884	2423.6965
0.0745	70.6903	74.2041	95.0886	69.4169	86.7515	52.0424	-7.9079	55.9081	390.6083	2422.3967
0.0746	70.6981	74.1821	95.0959	69.4426	86.7568	52.3351	-7.8736	55.6255	389.1626	2423.1292
0.0747	70.6698	74.1786	95.0711	69.4095	86.7644	52.5348	-7.9449	56.3035	390.6582	2422.6772
0.0748	70.6448	74.1728	95.097	69.4395	86.7489	51.7442	-7.7232	55.5159	390.7993	2425.6591
0.075	70.704	74.1797	95.0368	69.4284	86.7173	51.3309	-7.8186	57.0205	391.8875	2421.7715
0.0751	70.6619	74.1875	95.0609	69.4103	86.7394	51.8189	-7.8808	56.0815	389.8459	2421.1589

0.0752	70.6973	74.1716	95.101	69.4241	86.753	51.8428	-7.9715	56.1451	389.7982	2426.3031
0.0753	70.7118	74.1812	95.1539	69.3871	86.8206	51.539	-8.0023	56.0072	390.1743	2420.0779
0.0753	70.7	74.1858	95.1457	69.3826	86.7961	52.4428	-7.9074	56.2259	392.5519	2422.8375
0.0754	70.6917	74.1855	95.0726	69.4368	86.7802	52.041	-7.9394	54.5968	389.6764	2422.4622
0.0755	70.7037	74.1877	95.0636	69.4718	86.7518	52.1183	-8.0554	54.9185	391.1012	2423.3438
0.0756	70.7047	74.196	95.0663	69.4451	86.7811	51.9095	-7.9158	56.343	391.0694	2422.0865
0.0757	70.6821	74.2189	95.0757	69.4294	86.769	51.7508	-7.9528	56.2222	390.2318	2423.639
0.0759	70.6729	74.2301	95.1421	69.4148	86.7773	51.2816	-7.9827	56.1335	390.1543	2421.8517
0.076	70.6624	74.205	95.1005	69.4284	86.7282	51.5994	-8.1049	56.1946	390.1743	2421.6879
0.0761	70.6717	74.2314	95.1047	69.418	86.7712	51.6305	-8.0288	56.2193	392.1552	2424.4248
0.0762	70.6856	74.199	95.0655	69.4468	86.7246	51.6394	-7.9598	55.7916	389.9306	2423.1062
0.0763	70.6604	74.2024	95.0277	69.4754	86.7335	51.2157	-7.868	56.8431	390.924	2423.0459
0.0764	70.6636	74.177	94.9981	69.4764	86.7321	52.2107	-8.0766	55.1695	389.8353	2425.1225
0.0765	70.6668	74.1802	95.0366	69.4664	86.7537	52.1672	-8.1605	56.0143	390.3755	2425.6591
0.0766	70.688	74.2095	95.0262	69.4636	86.77	52.323	-7.968	55.7787	390.265	2422.3566
0.0767	70.6724	74.1914	95.0878	69.4417	86.7837	52.0759	-7.8818	55.4646	389.4732	2420.3448
0.0767	70.6785	74.2026	95.051	69.453	86.7619	52.506	-7.9913	56.1964	390.9461	2421.515
0.0769	70.7135	74.2146	95.0305	69.4724	86.7452	52.2729	-8.1923	55.2331	391.0906	2422.1785
0.0769	70.6929	74.2136	95.0846	69.4514	86.7607	51.5941	-8.0116	55.8906	391.0747	2421.5882
0.0772	70.7199	74.2031	95.0176	69.4601	86.7132	51.8622	-8.1262	56.4033	392.192	2422.581
0.0773	70.7198	74.1941	95.0375	69.4673	86.7207	51.5976	-8.1232	55.9754	389.3798	2422.3779
0.0774	70.7069	74.2202	95.0609	69.4984	86.6958	51.0938	-8.026	55.5618	391.0164	2423.7655
0.0774	70.7023	74.1855	95.0695	69.4615	86.7273	52.6806	-8.5656	56.2518	390.1155	2425.1298
0.0775	70.7012	74.1998	95.0759	69.4859	86.754	53.4517	-8.2069	56.7581	391.7379	2422.06
0.0776	70.6921	74.2238	95.0254	69.4986	86.7362	53.5548	-8.1957	56.3331	391.3559	2421.4108
0.0776	70.7	74.2133	95.0418	69.4913	86.7711	54.122	-8.2723	55.127	389.9624	2424.2485
0.0777	70.689	74.2146	95.0658	69.4838	86.7637	53.8519	-8.1315	56.2335	392.2505	2423.0908
0.0778	70.701	74.2046	95.0271	69.4984	86.7442	53.0442	-8.2384	55.7209	390.8575	2422.1019
0.0778	70.6961	74.2126	95.0848	69.4616	86.7882	53.3142	-8.2433	55.9414	392.9783	2421.6753
0.0779	70.6864	74.2182	95.0932	69.4778	86.7561	54.0963	-8.5114	56.2813	390.4588	2420.5612
0.078	70.6599	74.2171	95.0795	69.4818	86.7879	52.7865	-8.2962	56.3183	390.9517	2422.8696
0.0782	70.6721	74.2268	95.0387	69.4917	86.7572	52.8822	-8.224	56.2407	391.2673	2421.7795
0.0782	70.704	74.223	95.0231	69.5296	86.7415	54.741	-8.5244	56.8579	391.6936	2420.6975
0.0783	70.6844	74.2416	95.0095	69.5133	86.7507	54.8163	-8.2679	55.8083	390.0214	2421.8436
0.0784	70.6695	74.2219	94.907	69.5676	86.7062	54.3957	-8.2136	55.6431	390.9476	2420.8599
0.0785	70.6983	74.1848	94.9595	69.5448	86.7248	54.0465	-7.9007	56.4809	389.7876	2421.9409
0.0786	70.7054	74.2333	94.929	69.5531	86.7185	54.3166	-8.019	56.2335	390.5927	2422.3319
0.0787	70.6844	74.2391	94.7708	69.6219	86.6709	54.8469	-8.0402	56.9613	390.254	2422.2203
0.0788	70.7089	74.2075	94.8363	69.6268	86.7011	54.8358	-8.3004	56.6287	390.6526	2422.5009
0.0789	70.6995	74.2261	94.8421	69.6147	86.7499	54.5859	-7.9772	56.9724	391.594	2420.457
0.079	70.6873	74.2324	94.8976	69.6142	86.6967	54.457	-7.9121	56.9369	390.5821	2420.6606
0.0791	70.7056	74.2245	95.0102	69.537	86.754	53.8474	-7.8905	57.5785	390.4921	2421.6032
0.0792	70.7204	74.2011	94.9054	69.5817	86.7375	55.7573	-8.1446	56.8431	391.594	2421.9959
0.0792	70.6929	74.2282	94.942	69.5908	86.7098	56.976	-8.2983	56.6612	390.0948	2421.8719
0.0793	70.7193	74.2229	95.0114	69.5509	86.7406	55.7711	-8.083	56.1451	391.4931	2419.8556
0.0794	70.6827	74.2424	95.0198	69.5301	86.7709	51.5692	-8.1934	56.6612	389.9624	2421.9332
0.0794	70.6842	74.217	94.9832	69.5493	86.785	51.2191	-8.0652	55.3674	389.9306	2421.8029
0.0796	70.6761	74.2285	95.0278	69.5431	86.7862	51.3586	-7.8191	56.6117	390.7516	2426.5024
0.0797	70.6765	74.249	95.1656	69.4999	86.8085	47.7257	-7.6179	55.7011	391.0403	2420.2326
0.0797	70.6766	74.2168	95.1527	69.5131	86.8073	49.258	-7.8677	56.9263	392.7113	2425.2835
0.0798	70.6736	74.2138	95.0051	69.5299	86.7634	49.9129	-7.8172	56.1168	390.1319	2421.0362
0.08	70.6614	74.2314	94.9039	69.6083	86.7359	49.5705	-7.9223	55.3575	389.4345	2422.3726
0.0801	70.6746	74.227	94.8046	69.635	86.7197	50.1262	-7.756	56.7178	390.5556	2424.6318

0.0802	70.7056	74.2458	94.737	69.6351	86.7246	50.8779	-7.8629	56.4844	391.313	2422.9835
0.0803	70.6854	74.2452	94.7135	69.6585	86.7071	50.6295	-7.7442	56.37	391.3946	2420.7536
0.0804	70.6624	74.2294	94.7844	69.617	86.7552	50.8779	-7.4725	55.9754	389.0514	2419.9399
0.0805	70.6693	74.2546	94.8312	69.6267	86.7568	50.2886	-7.7273	56.0855	389.5563	2424.6489
0.0806	70.689	74.2292	94.843	69.5982	86.7462	50.7197	-7.7696	56.2299	391.2759	2422.2705
0.0807	70.6793	74.2316	94.7217	69.6587	86.6802	51.0636	-7.8302	55.3391	390.9529	2423.8115
0.081	70.7052	74.2331	95.0174	69.5424	86.8	50.8263	-7.6652	55.4169	389.5811	2421.6342
0.081	70.6929	74.2209	95.037	69.5304	86.805	51.6962	-7.9926	55.7633	392.3141	2423.9188
0.0811	70.7027	74.2551	95.0136	69.541	86.784	51.2893	-7.8239	56.9475	391.08	2423.3285
0.0812	70.7324	74.2539	95.1375	69.5022	86.8411	48.9574	-7.7536	56.4033	392.0757	2423.639
0.0814	70.6989	74.246	95.0901	69.5258	86.8214	49.2473	-7.5676	57.0131	390.1045	2424.6569
0.0815	70.6951	74.2294	94.9855	69.5886	86.795	49.3699	-7.7695	55.4388	390.9683	2423.086
0.0816	70.7051	74.2572	95.0376	69.5646	86.8017	50.6128	-7.7945	55.3611	391.4555	2422.9898
0.0817	70.6744	74.247	95.0173	69.5799	86.7712	50.6509	-7.9169	55.9709	391.0956	2423.7512
0.0817	70.7038	74.2534	94.9557	69.5917	86.7651	50.8562	-7.9234	57.5009	391.0015	2422.6451
0.0819	70.7069	74.247	95.0126	69.5742	86.8096	50.9419	-7.5746	56.5481	390.8628	2422.2169
0.0819	70.7032	74.2629	95.039	69.5593	86.8119	50.6415	-7.7297	55.5583	390.7092	2422.4622
0.0823	70.6988	74.2877	95.1044	69.5448	86.8412	50.6815	-7.891	56.8768	391.6361	2422.8148
0.0824	70.7025	74.2499	95.1836	69.5248	86.8528	50.6166	-7.6676	55.7775	390.6245	2423.9035
0.0825	70.6818	74.2748	95.2257	69.4995	86.9018	48.8116	-7.7879	56.747	391.6549	2421.3708
0.0826	70.6842	74.2536	95.222	69.4781	86.8768	49.7396	-7.8211	55.675	389.9677	2420.7066
0.0826	70.6746	74.2831	95.188	69.5365	86.8669	48.9186	-7.7017	56.2936	391.0217	2423.9418
0.0827	70.6617	74.2699	95.2168	69.5109	86.8599	51.2417	-7.8954	56.7692	391.1953	2420.4651
0.0828	70.6609	74.2641	95.1721	69.5296	86.853	51.8511	-7.9353	54.9029	390.4312	2422.1081
0.0829	70.671	74.2746	95.214	69.5287	86.8518	49.9618	-7.697	56.0965	390.1478	2421.7339
0.083	70.6772	74.2906	95.2004	69.5403	86.8764	49.9068	-7.7949	55.0064	391.0956	2423.3665
0.0831	70.6701	74.2452	95.2446	69.5084	86.8776	50.5385	-7.9465	57.1092	391.7158	2422.9738
0.0831	70.6641	74.258	95.1699	69.5304	86.8487	48.9435	-7.8376	55.53	391.3925	2420.8522
0.0832	70.6736	74.2675	95.2249	69.525	86.853	50.9463	-7.7191	56.3855	392.3352	2423.2672
0.0833	70.6619	74.2804	95.1206	69.5491	86.8673	52.61	-7.8921	54.792	389.5175	2421.7154
0.0834	70.6524	74.2731	95.1585	69.558	86.8373	53.1917	-7.6991	56.1698	390.5344	2422.2322
0.0835	70.6636	74.2746	95.1637	69.5682	86.845	53.2672	-8.2871	56.435	389.6764	2422.7228
0.0835	70.6937	74.2802	95.1713	69.5368	86.8284	52.4213	-7.9717	56.5728	390.7092	2421.8182
0.0836	70.6986	74.2655	95.1548	69.5568	86.8627	53.0504	-8.0879	55.8729	389.3268	2421.4579
0.0837	70.6795	74.2827	95.1506	69.5666	86.8416	51.1534	-7.6178	57.2311	390.9517	2421.6593
0.0837	70.702	74.2414	95.2393	69.5464	86.8495	50.9036	-7.8045	56.9724	390.9683	2422.597
0.0838	70.715	74.2467	95.2358	69.5404	86.8688	51.7266	-7.7813	56.0116	389.8774	2422.9738
0.0839	70.7103	74.2699	95.2544	69.5182	86.8826	51.4528	-8.0599	57.2232	391.3448	2423.4972
0.084	70.7105	74.2677	95.23	69.5497	86.8606	51.1089	-7.9599	54.8513	388.3046	2422.5619
0.084	70.7206	74.2533	95.2336	69.5387	86.852	50.5767	-7.9483	55.5901	391.6785	2423.2902
0.0841	70.701	74.271	95.2082	69.5534	86.864	51.7025	-7.6778	56.3737	389.7169	2423.9115
0.0842	70.6954	74.2781	95.195	69.5451	86.8786	51.0736	-7.7412	56.2444	390.553	2420.5773
0.0843	70.6993	74.2736	95.1742	69.569	86.8506	51.6411	-8.1123	56.5481	390.6827	2423.9878
0.0844	70.7118	74.2763	95.1833	69.5636	86.838	51.6429	-8.015	56.8415	389.5811	2420.7372
0.0844	70.6878	74.2499	95.195	69.5632	86.8642	51.8215	-8.1158	56.0603	389.8353	2423.5738
0.0845	70.7007	74.2886	95.1579	69.5434	86.8566	50.7011	-7.7512	56.1927	390.6969	2421.0662
0.0847	70.6857	74.2888	95.1911	69.5462	86.8898	51.2473	-7.6712	56.1705	390.9793	2423.118
0.0847	70.7	74.2852	95.2443	69.5362	86.9027	50.5078	-7.9188	56.3996	389.1853	2423.7031
0.0848	70.6724	74.276	95.2056	69.5616	86.8772	50.4985	-8.0039	55.6714	390.545	2421.5269
0.0849	70.678	74.289	95.1843	69.567	86.8365	50.5438	-7.9482	55.8234	390.937	2422.2935
0.0849	70.6821	74.3031	95.2135	69.569	86.8693	49.9867	-7.7545	56.8431	390.3592	2421.1784
0.085	70.6857	74.2786	95.1704	69.5917	86.8082	49.5984	-7.6268	56.1224	391.3946	2422.3566
0.0851	70.6898	74.2958	95.2469	69.5644	86.8412	49.6659	-7.7318	56.2229	390.2114	2420.8216

0.0852	70.6992	74.2896	95.2602	69.5216	86.8604	49.1441	-7.6687	56.6176	389.1354	2425.795
0.0853	70.6709	74.2893	95.2868	69.5288	86.8896	49.7944	-7.7951	55.945	390.2983	2422.8696
0.0854	70.6966	74.3002	95.3053	69.5331	86.9071	49.5477	-7.7146	55.8941	390.312	2423.9495
0.0855	70.6663	74.2669	95.2617	69.5206	86.8999	50.2552	-7.9386	56.8246	389.368	2423.8314
0.0856	70.6822	74.2882	95.2609	69.5345	86.9085	49.1887	-7.6782	55.675	390.1955	2422.4162
0.0857	70.6877	74.2807	95.2463	69.5536	86.8819	49.5185	-7.7561	56.5031	391.3282	2425.795
0.0858	70.6847	74.2834	95.222	69.5685	86.8792	48.7871	-7.7437	55.6078	389.2686	2424.2945
0.0858	70.6984	74.2837	95.2249	69.5779	86.83	36.3071	-6.9902	56.577	390.2374	2423.4386
0.0859	70.7235	74.3026	95.2242	69.5609	86.8135	18.4706	-6.8271	56.0567	391.2018	2422.1479
0.086	70.7052	74.3234	95.2302	69.5695	86.8195	10.5749	-6.7304	56.4208	390.116	2424.4171
0.0861	70.7355	74.2824	95.2997	69.5258	86.8037	2.3849	-6.9768	56.5179	390.7745	2423.1501
0.0861	70.6921	74.2697	95.3751	69.5331	86.8515	0.279	-7.2736	56.614	390.6693	2422.5089
0.0862	70.7269	74.2987	95.3602	69.525	86.807	-1.6436	-6.8958	56.3289	391.4295	2421.7492
0.0863	70.7171	74.2819	95.4185	69.549	86.8495	-1.6745	-6.8469	55.9487	389.213	2421.6593
0.0864	70.7074	74.3003	95.338	69.5697	86.8244	-1.6727	-6.795	54.6701	388.7644	2423.6791
0.0865	70.6978	74.3038	95.3439	69.5624	86.8246	-1.6161	-7.0378	55.9401	390.9052	2423.2442
0.0865	70.714	74.2865	95.317	69.574	86.8566	-1.2686	-7.1657	56.285	389.1908	2423.8233
0.0866	70.711	74.2951	95.296	69.5652	86.7838	-1.6569	-7.2299	56.4067	391.4454	2419.3036
0.0867	70.6775	74.3011	95.2909	69.5987	86.8024	-0.1083	-7.3289	55.2688	389.0081	2424.9454
0.0868	70.6873	74.3007	95.3656	69.5526	86.8561	-0.6822	-7.2263	55.0811	390.1637	2424.8005
0.0869	70.6812	74.3117	95.3433	69.5641	86.8482	-1.672	-7.2563	55.2861	389.5705	2421.1282
0.0869	70.6881	74.316	95.3428	69.5538	86.8719	-0.6884	-7.1201	56.1628	390.6933	2421.8719
0.0872	70.6515	74.3031	95.2769	69.6203	86.8036	9.2675	-7.2704	56.237	389.9439	2423.5027
0.0873	70.6837	74.2848	95.2442	69.6155	86.7706	10.4843	-7.3133	56.488	390.508	2420.7526
0.0874	70.6767	74.285	95.2468	69.5975	86.781	11.2043	-6.7693	56.9576	390.3426	2421.6032
0.0874	70.6478	74.3124	95.2003	69.615	86.7677	14.4854	-6.8548	55.6502	390.741	2422.6998
0.0875	70.6744	74.3286	95.2727	69.611	86.769	8.5113	-7.2137	56.0005	390.9074	2423.1741
0.0876	70.6695	74.3024	95.3024	69.6011	86.8024	4.5007	-7.3089	56.8768	389.6393	2424.1028
0.0877	70.6812	74.319	95.2894	69.5805	86.816	0.4703	-7.4824	56.5445	390.8893	2421.5039
0.0878	70.6824	74.2909	95.327	69.555	86.8368	-0.2806	-7.1306	56.5339	388.7018	2421.7185
0.0878	70.6588	74.3156	95.3131	69.5547	86.845	2.8763	-6.9389	56.5437	390.7191	2424.3844
0.088	70.702	74.3104	95.3405	69.576	86.8891	13.2174	-7.0085	56.0426	390.8681	2425.5901
0.088	70.6987	74.3146	95.253	69.5987	86.8481	19.0557	-7.11	56.7507	390.2927	2424.4565
0.0881	70.7232	74.3024	95.1732	69.6071	86.8036	21.4428	-6.9401	56.184	389.8088	2422.1939
0.0882	70.7164	74.3175	95.1669	69.6179	86.807	22.812	-7.0475	56.7142	389.9412	2419.8096
0.0883	70.6849	74.311	95.228	69.604	86.823	16.4538	-6.8566	56.5253	390.924	2423.4547
0.0884	70.7083	74.2997	95.2464	69.6054	86.831	19.3609	-6.878	56.9263	389.7929	2422.0789
0.0885	70.7306	74.3219	95.3032	69.5798	86.8976	26.7688	-6.7246	55.9189	390.8999	2424.2791
0.0886	70.7061	74.3097	95.3507	69.5692	86.8872	39.1561	-7.2786	56.032	391.3183	2422.6079
0.0887	70.7306	74.3362	95.3244	69.5508	86.9248	45.1804	-7.5556	55.6642	389.2517	2422.7253
0.0887	70.7289	74.3324	95.2717	69.5651	86.9073	43.279	-7.3667	55.5548	390.3967	2425.4981
0.0889	70.7171	74.338	95.2065	69.59	86.8546	47.1098	-7.6159	55.2503	389.3071	2419.9681
0.089	70.7093	74.3275	95.1899	69.6192	86.83	48.2646	-7.8601	56.4597	391.0164	2423.6198
0.0891	70.7033	74.3319	95.2711	69.594	86.8257	47.5891	-7.8787	55.7225	389.5563	2422.8215
0.0892	70.7133	74.3368	95.2446	69.6029	86.8523	49.0215	-8.0325	56.9059	390.4976	2422.7413
0.0892	70.6905	74.3307	95.1771	69.6306	86.8632	48.2229	-7.8814	56.1416	391.027	2421.7645
0.0893	70.6978	74.338	95.2631	69.5881	86.8817	48.8147	-7.769	57.0748	389.6764	2420.6299
0.0894	70.7047	74.3351	95.2899	69.5712	86.8746	49.8996	-7.7915	55.6431	388.6171	2423.6198
0.0894	70.6974	74.3131	95.2734	69.5888	86.8848	47.775	-7.6754	57.1561	390.6033	2422.9145
0.0896	70.6847	74.3443	95.2906	69.5939	86.9092	48.5712	-7.8728	56.0497	390.1001	2421.1819
0.0897	70.679	74.3306	95.2677	69.5829	86.9186	51.6003	-7.9739	56.0929	389.7224	2423.5749
0.0898	70.6637	74.3306	95.162	69.6267	86.8555	48.6184	-7.9969	55.9155	390.5585	2423.8714
0.0899	70.6908	74.3475	95.2037	69.6305	86.8036	48.7178	-7.873	55.6346	389.9937	2423.8073

0.09	70.6683	74.3174	69.6374	86.851	48.6026	-7.592	56.5068	390.4367	2423.9115
0.0901	70.6624	74.3465	69.6348	86.8697	48.5579	-7.6495	55.6608	391.5461	2422.2629
0.0902	70.6793	74.3365	69.6128	86.8576	48.8786	-7.6889	56.191	391.1488	2423.8115
0.0903	70.6912	74.3168	69.6392	86.8911	49.3807	-7.7379	57.0147	390.8204	2422.9145
0.0904	70.711	74.3609	69.6428	86.8753	48.4388	-7.8923	56.5834	390.9529	2424.3941
0.0906	70.6778	74.3421	69.6499	86.8786	49.0364	-7.6416	56.3553	390.9793	2424.8412
0.0906	70.6886	74.3604	69.6568	86.8576	48.7258	-7.6692	56.0178	391.4454	2424.3788
0.0907	70.691	74.3409	69.6506	86.8443	49.4402	-7.9534	58.2625	390.2484	2422.8455
0.0908	70.7074	74.3462	69.6574	86.8581	49.2278	-7.9024	56.4218	390.8575	2423.0619
0.0909	70.7096	74.3424	69.6338	86.8736	49.0279	-7.9789	55.9189	390.6616	2422.3089
0.091	70.7245	74.3524	69.656	86.8472	49.6188	-7.8568	56.1628	390.4974	2422.7612
0.0911	70.7169	74.3448	69.6161	86.8973	49.1443	-7.7736	56.4703	391.0959	2423.8805
0.0912	70.7273	74.3457	69.6203	86.8745	48.8153	-7.6894	57.5748	390.1931	2422.6211
0.0912	70.724	74.369	69.6357	86.8464	49.2705	-7.9504	55.4911	390.6404	2423.4052
0.0913	70.7245	74.3658	69.6469	86.9034	49.2073	-7.7267	56.4329	390.636	2422.4608
0.0914	70.7087	74.3449	69.6456	86.9072	48.4112	-7.7894	56.6066	392.0093	2423.4947
0.0915	70.7193	74.3399	69.6384	86.8564	48.5641	-7.8592	56.0214	391.3236	2423.3362
0.0916	70.6932	74.3602	69.6524	86.8484	48.9933	-7.8822	56.8839	391.0323	2422.7152
0.0917	70.6938	74.3301	69.6208	86.8802	48.6425	-7.7166	56.9724	389.0081	2421.6593
0.0917	70.6913	74.368	69.632	86.8694	48.5285	-7.8805	55.3851	391.0111	2422.2859
0.0919	70.68	74.3641	69.623	86.9017	48.7498	-7.7805	56.4703	390.1372	2420.8982
0.0922	70.6757	74.3579	69.6249	86.8918	48.7466	-7.7883	55.5792	389.7667	2421.8597
0.0923	70.7003	74.3624	69.6944	86.8683	48.8937	-7.9963	55.1341	390.2643	2422.7152
0.0924	70.679	74.3638	69.6729	86.9065	49.2426	-7.7831	55.6272	390.4699	2424.2401
0.0924	70.6742	74.368	69.6506	86.8927	48.5836	-7.8692	56.9016	391.2442	2421.1895
0.0925	70.7105	74.3671	69.6651	86.8936	48.832	-7.812	56.7248	391.5774	2422.3566
0.0926	70.7064	74.3809	69.6573	86.9088	48.663	-7.8925	56.2333	390.0823	2422.8215
0.0929	70.6768	74.3756	69.6377	86.9235	48.9764	-7.9434	56.343	390.3649	2421.7952
0.0931	70.691	74.3604	69.6651	86.878	49.5211	-7.8613	55.8517	390.6827	2425.6361
0.0933	70.7237	74.3907	69.6986	86.8772	49.1807	-8.1282	56.1451	389.5652	2423.6122
0.0933	70.7135	74.3778	69.713	86.8702	49.5575	-7.8971	57.3089	391.0735	2422.549
0.0934	70.6734	74.3868	69.7458	86.8634	50.0231	-8.0243	56.2017	389.5546	2423.9572
0.0935	70.6891	74.356	69.7306	86.8557	51.012	-8.1413	57.453	390.6457	2420.9519
0.0936	70.7233	74.3682	69.7245	86.8884	51.9806	-7.9511	56.8591	390.3014	2422.2552
0.0937	70.7152	74.3895	69.6959	86.9133	51.3817	-8.2254	57.0606	390.5133	2423.0218
0.0938	70.7071	74.3893	69.6862	86.9627	52.3648	-8.2097	55.764	390.4256	2421.0341
0.094	70.7153	74.3567	69.7307	86.8902	49.6114	-8.0246	56.7655	391.0624	2422.2604
0.0941	70.7247	74.3965	69.711	86.8896	49.8347	-7.9917	56.7248	390.5397	2421.0209
0.0942	70.7007	74.3957	69.6936	86.9042	49.3578	-8.0259	55.7677	389.7002	2422.8776
0.0943	70.6983	74.3604	69.6751	86.946	49.0337	-7.7868	56.5304	390.3014	2423.7808
0.0944	70.7167	74.3714	69.7565	86.8862	49.306	-7.7483	56.5728	389.92	2421.4119
0.0946	70.7013	74.3585	69.7312	86.9314	49.2545	-8.1051	56.6612	391.3766	2423.9035
0.0947	70.735	74.3848	69.7235	86.9431	49.3993	-7.9246	57.0606	389.83	2421.6419
0.0947	70.6954	74.4005	69.6944	86.9556	48.8385	-7.8276	55.0803	389.9273	2427.39
0.0948	70.7147	74.4036	69.6876	86.9754	48.4788	-7.8116	56.7743	390.5503	2421.1742
0.0949	70.7041	74.3964	69.6358	86.9989	49.1033	-7.9257	55.5459	389.1853	2421.0261
0.0949	70.7281	74.3731	69.6824	86.98	49.1168	-8.1371	56.7955	390.937	2422.4929
0.095	70.7069	74.4043	69.7258	86.9234	48.976	-7.9188	56.9207	390.4644	2422.9257
0.0951	70.6742	74.4227	69.7024	86.9432	49.551	-7.7394	57.9776	389.8885	2421.8597
0.0952	70.6596	74.4031	69.722	86.9399	49.2463	-7.889	55.6679	389.0192	2424.8973
0.0953	70.6997	74.3793	69.741	86.908	49.4934	-8.0108	56.0448	389.6116	2424.7611
0.0955	70.6913	74.3888	69.7445	86.9166	49.3011	-7.9634	55.9857	390.0491	2420.5212
0.0957	70.6908	74.401	69.7067	86.9298	48.9807	-7.7791	55.5644	389.667	2423.2062

0.0957	70.701	74.3924	95.3169	69.6939	86.9744	48.3508	-7.6386	58.1812	389.6446	2420.8446
0.0958	70.7	74.3923	95.2983	69.6803	86.9569	49.3959	-8.0114	56.6953	390.8077	2422.1402
0.0959	70.675	74.426	95.2933	69.6957	86.9518	49.3931	-8.1474	56.2924	391.3946	2422.6051
0.0961	70.6514	74.4014	95.3123	69.6819	86.9795	49.3993	-7.8429	56.131	391.0694	2422.4009
0.0962	70.6921	74.387	95.2889	69.6964	86.9804	49.6504	-7.9785	55.4018	388.8973	2422.052
0.0962	70.671	74.3917	95.2702	69.6956	86.9397	49.0359	-7.7082	56.0673	389.8936	2423.4128
0.0963	70.6756	74.45	95.2696	69.6827	86.9076	48.7329	-7.9093	56.7814	390.8257	2423.8345
0.0965	70.6705	74.4034	95.2971	69.7203	86.9521	49.5051	-8.1297	57.651	391.6096	2423.9495
0.0965	70.6619	74.4206	95.2897	69.6844	86.9609	48.8952	-8.0783	56.1816	390.78	2423.3184
0.0966	70.6798	74.3882	95.2968	69.7005	86.9616	48.8058	-7.7752	57.2692	390.0948	2423.3285
0.0967	70.6747	74.3926	95.2986	69.6985	86.9572	49.0187	-7.9899	56.9466	390.2761	2420.8658
0.0968	70.6867	74.3867	95.3154	69.7283	86.931	48.7391	-8.1597	56.9059	390.8409	2422.0681
0.0969	70.6702	74.4104	95.3127	69.7142	86.9436	49.3656	-7.9649	57.2409	391.419	2423.1598
0.097	70.6913	74.4117	95.3314	69.7087	87.0078	48.6063	-7.8344	55.2983	389.6504	2423.6069
0.0971	70.6961	74.4046	95.2612	69.7549	86.9283	48.995	-8.1398	56.8591	390.3014	2424.5551
0.0972	70.6872	74.4127	95.2973	69.7253	86.9457	49.7814	-8.0768	56.0485	389.2517	2421.9158
0.0973	70.6905	74.4209	95.2625	69.7074	86.9514	49.2474	-7.9859	56.6082	390.651	2423.1062
0.0974	70.6859	74.4319	95.3102	69.7179	86.9409	48.5106	-8.0355	56.4218	389.6283	2422.581
0.0974	70.691	74.419	95.3145	69.711	86.9769	49.2438	-7.8979	56.9687	391.0164	2422.9988
0.0975	70.68	74.43	95.2635	69.7157	86.9354	49.4526	-7.9777	56.4279	390.7039	2423.0065
0.0977	70.6981	74.4236	95.3427	69.6785	86.9737	48.7631	-8.0313	56.9192	390.1531	2422.1709
0.0978	70.7197	74.4375	95.3398	69.6788	86.9706	48.6537	-8.1764	56.3996	389.8664	2424.0958
0.0979	70.7044	74.408	95.3561	69.692	86.975	48.9417	-8.0104	55.5017	391.4878	2422.6002
0.098	70.7038	74.437	95.3369	69.7296	86.9728	49.2547	-8.1854	56.9687	392.3415	2420.5372
0.0981	70.7271	74.4092	95.2945	69.7123	86.9632	48.5905	-7.6587	56.9503	389.8054	2422.2684
0.0981	70.7132	74.4119	95.3294	69.6846	86.9385	48.9604	-7.9886	56.9475	391.2759	2421.2279
0.0982	70.7338	74.4251	95.2797	69.7247	86.9525	49.3798	-8.1503	56.0002	390.5503	2421.6572
0.0983	70.7179	74.4459	95.2645	69.7534	86.9179	49.1943	-8.1826	56.5844	389.5175	2420.433
0.0984	70.7222	74.4094	95.2935	69.7828	86.9216	49.8929	-8.0092	56.6103	388.6925	2424.3603
0.0985	70.7232	74.4411	95.3352	69.6998	86.9913	48.897	-7.7317	56.1261	390.3149	2423.8794
0.0986	70.7279	74.4558	95.3596	69.7201	86.9785	49.3238	-8.0222	57.7535	390.5927	2422.9758
0.0987	70.6951	74.4258	95.3483	69.7283	86.9867	48.8209	-7.8717	56.1261	389.6892	2422.9978
0.0988	70.6908	74.4316	95.3132	69.7057	86.9668	48.3787	-7.8256	56.5733	389.9051	2426.3801
0.0989	70.6936	74.4395	95.32	69.7202	86.9761	49.1451	-8.1242	56.7507	390.5198	2424.8573
0.099	70.7064	74.4293	95.2943	69.7274	86.9554	49.4173	-8.188	56.3109	390.481	2422.565
0.0991	70.704	74.4709	95.3275	69.7193	86.9754	48.621	-7.8151	56.3501	388.7336	2423.0218
0.0992	70.6911	74.437	95.2945	69.725	86.9733	48.8952	-8.1023	56.3405	391.1178	2420.7776
0.0992	70.6918	74.4441	95.2603	69.7418	86.9637	48.8538	-7.8518	56.9016	391.0164	2424.0262
0.0994	70.6895	74.4507	95.3347	69.735	86.9579	48.4855	-8.1016	56.4218	390.6028	2424.3283
0.0997	70.7051	74.4484	95.3824	69.7348	87.0007	49.4591	-8.0977	56.444	391.295	2421.0502
0.0998	70.6966	74.4221	95.3326	69.7269	86.9611	49.5193	-8.1615	56.8945	390.1584	2421.1512
0.0999	70.6737	74.4334	95.3226	69.756	86.9608	48.812	-7.8808	57.1808	390.1584	2423.4052
0.1	70.6954	74.4526	95.3441	69.7411	86.9678	49.3709	-7.9529	56.8874	390.7781	2425.1991
0.1001	70.6916	74.4706	95.3731	69.7355	86.9635	48.7493	-8.0957	55.7159	390.2263	2422.1322
0.1002	70.6936	74.4727	95.3783	69.7306	87.0245	48.9491	-8.1948	55.6568	389.3957	2422.8776
0.1003	70.6903	74.4499	95.3837	69.72	87.0027	49.314	-8.1113	56.1628	389.2474	2422.6845
0.1003	70.7191	74.4497	95.3622	69.7169	87.0007	48.9797	-7.9485	55.6937	390.9074	2419.9441
0.1005	70.6893	74.4632	95.3569	69.7498	87.0004	49.5371	-8.2106	56.0116	390.7246	2422.2764
0.1005	70.7026	74.4689	95.3649	69.7376	86.9832	48.9927	-7.957	56.6657	391.2396	2421.5471
0.1006	70.7394	74.4697	95.348	69.7572	87.0008	49.2891	-8.155	55.7916	390.3861	2421.0822
0.1007	70.7181	74.4589	95.3554	69.7534	87.0116	48.7754	-7.9947	56.3109	389.5507	2422.7573
0.1009	70.7255	74.4765	95.3768	69.7624	86.9774	48.8636	-8.0592	57.0611	389.4234	2422.4768
0.101	70.7248	74.4579	95.3596	69.722	86.9627	49.368	-7.939	57.7818	390.3259	2423.9596

0.1011	70.7243	74.4676	95.3647	69.7424	87.0058	49.5733	-8.0038	56.614	391.0126	2421.0101
0.1012	70.733	74.4878	95.3837	69.7249	86.993	48.916	-8.1148	56.739	390.3067	2421.2739
0.1014	70.7008	74.4875	95.3233	69.7286	86.9617	48.7698	-7.9625	54.0086	391.3946	2422.3165
0.1015	70.7057	74.4458	95.3026	69.7772	86.9455	48.7409	-8.0021	56.1875	389.8618	2420.1546
0.1016	70.6815	74.4753	95.3335	69.7328	86.9839	48.9293	-8.0151	55.9224	389.1521	2424.7238
0.1017	70.7054	74.4538	95.3528	69.7381	87.0166	49.0327	-7.943	57.3644	391.1012	2421.5551
0.1018	70.6959	74.4979	95.3648	69.7502	87.0312	49.6932	-8.0832	56.965	391.1676	2421.1944
0.1019	70.6766	74.4851	95.3999	69.7266	87.0529	49.1425	-8.1554	56.4562	390.455	2422.5235
0.1021	70.6835	74.4919	95.3947	69.736	87.0234	49.6925	-8.1739	55.9118	390.5715	2423.0065
0.1022	70.7061	74.503	95.3452	69.7968	87.009	48.989	-8.0244	57.2163	389.894	2423.1821
0.1023	70.6944	74.4687	95.3355	69.791	87.0052	49.1221	-8.1347	55.7209	390.9529	2421.5805
0.1024	70.7152	74.4797	95.3342	69.7555	86.9797	48.8458	-8.0331	56.5269	389.9095	2424.1105
0.1026	70.6903	74.4865	95.3857	69.7513	86.9998	49.1132	-8.0663	56.3112	390.508	2422.8608
0.1027	70.7166	74.4931	95.4493	69.7156	87.0628	48.9175	-8.0707	56.9244	390.0712	2422.0841
0.1029	70.7135	74.4902	95.3489	69.7679	86.9993	49.1994	-7.9206	55.5512	390.2114	2422.4622
0.103	70.714	74.4982	95.3127	69.7869	86.9891	49.3188	-8.1431	56.2074	388.9029	2425.5706
0.1032	70.7145	74.5034	95.4301	69.7254	87.0298	48.9906	-7.9649	56.7107	391.8903	2423.9802
0.1033	70.6969	74.5193	95.4266	69.7412	87.0223	49.1159	-7.9506	56.6066	391.8985	2422.1562
0.1034	70.7113	74.5075	95.4229	69.745	87.0081	49.5655	-8.1978	56.039	389.4698	2422.8378
0.1035	70.7069	74.4936	95.3818	69.7495	87.0103	48.7493	-8.2523	56.8948	392.2917	2422.4367
0.1035	70.6903	74.5025	95.3867	69.7698	87.038	48.8627	-8.2837	56.6324	387.9671	2424.152
0.1036	70.6937	74.4997	95.3257	69.7518	86.9882	49.1612	-8.3486	56.9617	390.5027	2423.6122
0.1037	70.6816	74.5244	95.3705	69.7867	86.9863	49.0968	-8.0362	56.3072	390.2041	2422.4127
0.1037	70.6793	74.5073	95.3632	69.7799	87.0209	48.9319	-7.9905	55.6926	391.1065	2423.3055
0.1038	70.6874	74.4958	95.3386	69.8063	87.0156	48.7498	-7.9953	56.7849	389.3374	2423.2058
0.1039	70.6888	74.4984	95.3564	69.78	87.0456	49.5222	-8.2497	56.4957	391.3116	2422.7173
0.104	70.6942	74.4953	95.3523	69.7909	87.0342	49.3176	-8.2192	57.499	388.8713	2422.6768
0.104	70.71	74.4915	95.3864	69.7925	87.0225	48.95	-8.2793	56.7433	390.7966	2421.2986
0.1041	70.701	74.5046	95.3995	69.7946	87.0476	49.5459	-8.0211	55.8729	389.8565	2420.6299
0.1042	70.714	74.5441	95.3546	69.7936	87.0387	49.5343	-8.1268	57.7448	390.8963	2422.9898
0.1042	70.7179	74.5043	95.383	69.778	87.0384	49.3167	-7.9397	56.7955	389.777	2422.1632
0.1043	70.7046	74.4989	95.3864	69.7976	87.0377	49.1116	-8.2308	56.8357	390.0602	2422.5249
0.1044	70.7	74.53	95.4006	69.7736	87.019	49.5612	-8.197	56.4994	390.4367	2419.0945
0.1045	70.7026	74.5173	95.3945	69.7828	87.0204	48.9175	-8.1341	56.6546	390.7136	2422.6692
0.1046	70.6969	74.5102	95.3642	69.7882	87.0001	49.1088	-8.0362	56.343	390.2749	2423.9035
0.1047	70.7194	74.4984	95.3727	69.7915	87.0138	48.7531	-8.075	57.4122	390.8464	2424.729
0.1048	70.7164	74.5175	95.4207	69.7819	87.0689	48.8991	-8.0155	56.7566	389.6552	2419.9936
0.1049	70.7203	74.5068	95.4088	69.7797	87.0522	49.5291	-8.1586	57.2232	391.5143	2423.1292
0.105	70.7142	74.4983	95.406	69.7914	87.0541	49.2136	-8.1062	56.1663	388.9455	2423.6352
0.1051	70.7098	74.5012	95.3511	69.7994	87.0233	48.9666	-8.1807	56.2123	389.2209	2422.2245
0.1052	70.7352	74.5321	95.3733	69.792	87.0397	49.5139	-8.1202	56.3405	390.4145	2423.2863
0.1055	70.6954	74.5051	95.3703	69.8299	87.019	48.9091	-8.0718	57.3568	390.5973	2423.4066
0.1055	70.6785	74.5188	95.4207	69.8119	87.0519	48.9036	-8.0682	57.2422	390.3979	2420.7456
0.1056	70.6708	74.5158	95.4159	69.7745	87.0325	48.9861	-7.9817	56.4279	390.1266	2422.8378
0.1057	70.7128	74.5199	95.4445	69.7772	87.0833	49.5408	-8.0731	56.88	392.2363	2423.0779
0.1058	70.6993	74.5151	95.4233	69.7821	87.0667	48.8227	-8.2106	56.3183	389.5599	2423.8422
0.1058	70.6952	74.5085	95.4598	69.7848	87.0863	48.7187	-8.2707	56.3112	390.9952	2423.1982
0.106	70.7112	74.5464	95.466	69.7734	87.0263	49.355	-8.0454	56.6768	389.8774	2421.0181
0.106	70.6681	74.516	95.3909	69.8201	87.06	48.9751	-7.9325	56.1816	388.6592	2422.4448
0.1061	70.6874	74.4934	95.3446	69.8051	87.0168	49.0786	-7.9627	56.0497	390.3914	2422.2629
0.1063	70.6985	74.5158	95.4303	69.8063	87.0514	49.1023	-7.9858	56.2629	390.3093	2422.02
0.1064	70.7158	74.5408	95.4727	69.7879	87.0914	49.5362	-7.9783	56.5696	390.2374	2424.0878
0.1065	70.7052	74.5258	95.4586	69.7787	87.073	49.5593	-8.1327	56.6152	391.2442	2437.8565

0.1065	70.7059	74.5487	95.4475	69.7956	87.0838	48.9491	-7.9888	55.6383	389.8553	2439.0598
0.1066	70.7213	74.5175	95.4613	69.7789	87.0757	49.5708	-8.2355	56.7425	390.7781	2441.0841
0.1067	70.6946	74.5272	95.4265	69.7922	87.007	48.859	-8.195	56.5844	390.625	2455.4023
0.1069	70.7197	74.5344	95.4588	69.807	87.047	49.5752	-8.0757	56.3035	391.6826	2475.8005
0.1069	70.7152	74.5309	95.4789	69.7747	87.1054	49.5184	-8.2609	55.9613	390.6616	2471.9801
0.107	70.7194	74.5112	95.494	69.7838	87.0873	49.3857	-8.3104	57.1313	390.3647	2482.525
0.1071	70.6982	74.5334	95.4647	69.8079	87.0985	49.2017	-8.1273	55.3501	391.1288	2492.0228
0.1072	70.7112	74.5311	95.4967	69.7636	87.1357	49.0745	-8.0671	56.1187	389.7722	2507.4115
0.1073	70.7206	74.5363	95.4695	69.7677	87.0984	48.8573	-8.312	57.0111	390.8046	2508.0127
0.1075	70.7182	74.5534	95.5052	69.7549	87.1682	48.5899	-8.3378	57.096	390.3067	2529.6015
0.1076	70.6695	74.5365	95.5518	69.719	87.1811	48.7347	-8.2572	56.2264	389.4804	2544.9499
0.1076	70.7033	74.5334	95.5735	69.7544	87.2077	48.8478	-7.9178	57.1202	390.5585	2543.3347
0.1077	70.7049	74.5502	95.6134	69.6875	87.1996	48.688	-8.1577	56.2592	389.5673	2561.3123
0.1079	70.6993	74.5468	95.5528	69.7738	87.1118	48.4797	-8.3226	56.0956	392.6901	2577.1262
0.108	70.681	74.5382	95.6332	69.7525	87.1319	49.0786	-8.2658	56.3749	390.5291	2579.0121
0.1081	70.6708	74.5597	95.6392	69.7513	87.0895	49.0688	-8.2593	55.6926	389.3798	2595.6868
0.1082	70.6865	74.5446	95.7661	69.6944	87.1451	48.5849	-8.0334	56.3331	389.8497	2595.3759
0.1083	70.6745	74.5351	95.7684	69.6834	87.1043	48.8878	-8.1659	55.2909	389.4843	2606.6289
0.1083	70.6832	74.5356	95.8392	69.7117	87.1568	48.9142	-8.1552	56.9581	389.973	2614.9067
0.1084	70.7186	74.5173	95.787	69.7053	87.1457	47.999	-7.7427	56.64	389.8936	2609.6168
0.1085	70.6877	74.5688	95.7873	69.7204	87.1258	48.9323	-8.3155	56.8098	390.708	2624.0615
0.1085	70.7166	74.5466	95.8143	69.735	87.1555	48.4697	-7.8866	56.4809	389.7335	2628.0931
0.1086	70.7056	74.5637	95.8189	69.6808	87.1271	47.5742	-7.5531	57.1942	389.811	2641.4059
0.1087	70.6915	74.5487	95.7834	69.6601	87.1372	48.9453	-8.2684	55.0882	390.3702	2645.8947
0.1087	70.7269	74.5622	95.7989	69.6708	87.1236	47.9048	-7.874	56.8132	388.3046	2646.048
0.1088	70.7152	74.5456	95.8175	69.6702	87.1254	47.7537	-7.7854	56.8061	390.974	2663.566
0.1089	70.7082	74.5663	95.7553	69.6905	87.081	48.6462	-7.8397	54.3744	389.5507	2664.1204
0.109	70.7265	74.5787	95.8605	69.655	87.1612	47.5014	-7.8158	57.7924	391.1647	2662.7533
0.109	70.7488	74.5711	95.83	69.6716	87.1611	47.9728	-8.0588	56.4587	389.6615	2680.7034
0.1091	70.7184	74.5902	95.832	69.6628	87.1108	48.0789	-7.7066	55.8376	390.9423	2681.8812
0.1092	70.7135	74.5756	95.8288	69.6889	87.1391	47.656	-7.8879	56.0885	388.5112	2679.0063
0.1092	70.7184	74.5609	95.8438	69.6919	87.1784	48.397	-8.1979	56.6718	390.8363	2699.3379
0.1093	70.7465	74.5866	95.7989	69.7066	87.1527	47.774	-7.7361	57.5009	389.4843	2697.4707
0.1094	70.7072	74.5703	95.7275	69.7032	87.1164	48.4744	-8.1419	57.7965	389.6836	2715.1678
0.1095	70.6969	74.5761	95.7702	69.7151	87.1433	47.1682	-7.7778	55.8694	388.7177	2715.9972
0.1096	70.7118	74.5617	95.7636	69.706	87.1222	47.4916	-7.7309	57.1561	388.8449	2730.8395
0.1097	70.7133	74.5631	95.8151	69.6873	87.1617	48.5614	-8.2958	55.4664	389.7347	2730.3795
0.1097	70.6962	74.5874	95.8097	69.6792	87.1433	47.5315	-7.7752	56.6953	389.9937	2733.0412
0.1098	70.7181	74.5635	95.8101	69.6898	87.1132	47.6523	-7.8304	56.3959	389.7279	2750.1452
0.1099	70.7148	74.5652	95.8287	69.6882	87.1192	47.2779	-7.6975	56.1816	390.1654	2746.322
0.11	70.7172	74.5646	95.8018	69.7203	87.146	47.4481	-7.6845	56.3996	390.2325	2767.4318
0.1101	70.6927	74.567	95.8105	69.7217	87.1377	48.3695	-8.209	55.629	389.7241	2766.6498
0.1101	70.7115	74.5721	95.854	69.6882	87.1699	47.2751	-7.6102	56.6731	389.8553	2767.0087
0.1102	70.7064	74.5951	95.8326	69.6895	87.1535	47.7164	-7.9735	57.0131	389.6116	2783.1669
0.1103	70.6979	74.577	95.8829	69.6484	87.1813	47.3992	-7.695	56.3324	389.8141	2783.9991
0.1104	70.6783	74.577	95.8636	69.6875	87.1619	47.4161	-7.6441	56.1981	389.7559	2795.8592
0.1105	70.6775	74.5867	95.8876	69.6915	87.1808	47.3922	-7.3664	57.4602	389.7279	2800.9522
0.1106	70.6857	74.577	95.9057	69.6511	87.1737	47.2705	-7.8289	57.342	390.5807	2814.8261
0.1107	70.6801	74.5688	95.8761	69.6646	87.1769	47.4247	-7.6282	57.3715	389.7058	2818.3847
0.1108	70.7018	74.5907	95.8761	69.6757	87.1236	47.0162	-7.6715	56.7602	389.8141	2833.356
0.1109	70.6931	74.5589	95.8606	69.7102	87.1613	47.3894	-7.4906	57.1555	390.5696	2836.6669
0.111	70.6893	74.5805	95.9009	69.6693	87.174	47.1785	-7.7401	55.5311	389.4289	2840.1775
0.1111	70.691	74.5995	95.9008	69.686	87.1847	47.6835	-8.1318	57.1632	390.7569	2844.4111

0.1112	70.6935	74.6043	95.8416	69.675	87.1447	47.3636	-7.5244	55.6113	390.9052	2852.8673
0.1112	70.6908	74.587	95.8867	69.6963	87.1828	46.8785	-7.5604	55.5583	389.9095	2855.0752
0.1113	70.6793	74.6	95.8848	69.6919	87.222	47.4907	-7.8464	56.039	389.8088	2853.1969
0.1115	70.7052	74.5795	95.9301	69.7157	87.2239	47.305	-7.4298	57.2763	390.6774	2868.4073
0.1115	70.7092	74.5953	95.8385	69.7185	87.2051	47.957	-7.982	56.8394	390.7246	2868.8791
0.1116	70.7038	74.59	95.8684	69.6619	87.1945	47.1562	-7.7183	56.965	390.5807	2882.2642
0.1117	70.7025	74.589	95.8595	69.7053	87.2087	47.1086	-7.5896	57.4565	390.7834	2890.3872
0.1117	70.715	74.6112	95.8508	69.7137	87.217	48.0727	-7.9819	55.5548	389.3586	2885.7183
0.1118	70.7049	74.5808	95.8223	69.7124	87.1863	47.3513	-7.2622	56.0337	390.1654	2885.406
0.1119	70.7398	74.5979	95.9196	69.6856	87.2105	47.1506	-7.4952	55.5607	388.4765	2890.3833
0.112	70.736	74.6053	95.9367	69.6784	87.2281	47.3183	-7.2145	55.2048	388.1404	2888.5855
0.1121	70.7123	74.5524	97.0654	69.1418	87.3022	46.9789	-7.2705	57.4919	391.0853	2887.4509
0.1122	70.7267	74.618	96.112	69.6334	87.2295	47.4969	-7.314	56.9546	390.0683	2886.7379
0.1122	70.722	74.5928	95.8759	69.7232	87.2224	48.087	-7.7842	56.832	390.6305	2888.5639
0.1123	70.7372	74.6163	95.8544	69.7344	87.2181	46.9469	-7.2588	56.9086	389.74	2888.3325
0.1124	70.7332	74.6091	95.9216	69.703	87.2758	47.3782	-7.2984	55.1948	389.1022	2886.5522
0.1124	70.7217	74.6078	95.8693	69.7216	87.2233	48.1873	-7.7714	57.2792	390.6748	2888.067
0.1125	70.7363	74.6121	95.8431	69.7488	87.2097	48.4911	-7.6942	56.8763	390.4921	2884.1878
0.1126	70.7243	74.6034	95.8783	69.6999	87.2737	48.6272	-7.6885	54.4271	388.633	2887.6809
0.1127	70.7222	74.6185	95.9732	69.7092	87.2769	47.9588	-7.4941	56.8505	391.0735	2889.0769
0.1128	70.7501	74.6208	96.0024	69.68	87.3062	47.3699	-7.5495	56.9133	389.8387	2887.4579
0.1128	70.7262	74.6224	95.977	69.685	87.2976	48.4619	-7.7269	56.3961	390.9211	2887.4202
0.1129	70.7265	74.6275	96.0353	69.6951	87.3173	48.1385	-7.5006	57.2056	390.1955	2904.6009
0.113	70.7384	74.5834	96.0495	69.6655	87.3267	47.9332	-7.5252	56.8203	389.0938	2904.4092
0.1131	70.7278	74.642	96.0397	69.6948	87.3234	48.4075	-7.9068	56.0744	389.8054	2906.1568
0.1131	70.712	74.618	96.0328	69.7366	87.2809	48.0549	-7.5708	56.7602	389.5811	2922.2952
0.1132	70.7391	74.6175	96.1125	69.6739	87.3305	47.3178	-7.3052	56.8337	390.5973	2922.0024
0.1133	70.7488	74.6093	96.0885	69.6803	87.3141	48.3397	-7.7563	56.5511	389.4123	2924.5512
0.1133	70.7438	74.64	96.1487	69.6364	87.3585	47.5654	-7.5917	58.4393	389.4698	2939.6598
0.1134	70.7492	74.6136	96.1217	69.6872	87.3531	46.7772	-7.2927	57.4919	391.3289	2935.8419
0.1135	70.7217	74.6435	96.075	69.682	87.3513	48.0759	-7.5329	56.3109	390.4533	2945.9592
0.1135	70.7046	74.6086	96.1645	69.6601	87.3903	46.9862	-7.3638	57.3383	393.5708	2956.8837
0.1136	70.7363	74.5969	96.2438	69.6381	87.404	47.1571	-7.6797	56.5105	389.5452	2953.9261
0.1137	70.7382	74.627	96.3033	69.6144	87.4481	47.1513	-7.6212	56.6683	390.6774	2967.4739
0.1139	70.7135	74.6328	96.337	69.615	87.4495	47.0159	-7.2644	55.9561	389.2849	2989.9936
0.114	70.7105	74.6119	96.3419	69.6353	87.4215	47.7043	-7.8151	56.8283	388.9195	2990.3142
0.114	70.6844	74.6216	96.3633	69.6161	87.4227	47.9607	-7.4268	56.6842	391.4112	2991.853
0.1141	70.7054	74.6119	96.3669	69.6324	87.444	47.8241	-7.7431	55.9783	389.7002	3005.4465
0.1142	70.7035	74.6412	96.392	69.6236	87.4718	48.0203	-7.8144	57.1066	389.8777	3009.6167
0.1143	70.6773	74.6195	96.4947	69.6392	87.4456	47.8836	-7.7175	57.3937	391.7324	3022.1737
0.1144	70.7161	74.6252	96.509	69.6486	87.4524	47.7535	-7.5029	56.5548	389.5784	3023.2878
0.1144	70.6844	74.6445	96.5986	69.6013	87.4689	47.0958	-7.4266	55.387	390.2761	3026.4858
0.1145	70.7006	74.6236	96.6707	69.6002	87.4825	47.6773	-7.7856	55.7845	389.5811	3025.034
0.1146	70.6825	74.6275	96.6721	69.6041	87.4573	47.3477	-7.5317	56.6718	389.9042	3027.1193
0.1147	70.6871	74.6248	96.7337	69.6102	87.5167	46.5702	-7.2906	56.5764	389.7982	3025.5937
0.1147	70.6924	74.6422	96.7387	69.5821	87.498	47.8185	-7.7484	56.625	389.9107	3027.9846
0.1148	70.6928	74.6351	96.7656	69.5967	87.5428	46.9063	-7.002	58.5541	389.8774	3025.2355
0.1149	70.7056	74.6453	96.8103	69.6189	87.5902	47.3634	-7.7853	54.999	389.811	3027.3995
0.1149	70.6857	74.6535	96.8292	69.5639	87.5763	47.08	-7.3958	57.7596	390.9572	3025.0191
0.115	70.6788	74.6336	96.9304	69.5698	87.6536	46.8403	-7.5036	56.5198	390.3597	3024.3824
0.1151	70.7143	74.6387	96.9824	69.6015	87.6313	47.1544	-7.5233	56.662	389.2849	3026.1011
0.1152	70.7054	74.645	96.9907	69.6048	87.6928	47.0735	-7.6025	56.7137	389.6504	3024.0733
0.1153	70.7091	74.659	97.0873	69.6334	87.7772	46.5959	-7.3683	57.0288	388.5112	3019.5295

0.1154	70.7196	74.6573	97.0221	69.6603	87.7772	47.0873	-7.761	56.4173	390.2378	3023.6924
0.1155	70.692	74.6419	97.1145	69.6023	87.7924	48.0425	-7.7566	57.0889	390.6933	3023.8457
0.1156	70.7199	74.6478	97.3534	69.5485	87.9354	47.656	-7.8698	57.4353	390.8046	3025.149
0.1157	70.7322	74.6514	97.3483	69.5811	87.8846	47.6281	-7.6545	55.6346	389.3182	3024.0733
0.1158	70.7521	74.656	97.3507	69.5862	87.9048	47.4117	-8.0882	57.342	390.1931	3029.7719
0.1158	70.724	74.647	97.3723	69.5921	87.9228	47.8986	-8.0403	55.8994	389.3374	3044.392
0.1159	70.7202	74.6573	97.4496	69.5713	87.9078	47.185	-7.6523	57.2681	389.5507	3051.749
0.116	70.7218	74.6546	97.4355	69.5975	87.9111	47.7235	-7.8808	55.9507	389.777	3059.7327
0.116	70.7061	74.628	97.5844	69.5468	87.962	47.8771	-7.9772	56.9872	390.2706	3059.5156
0.1161	70.7434	74.6575	97.5427	69.6299	87.9203	46.8088	-7.6782	57.5711	390.4367	3073.9105
0.1162	70.7267	74.6619	97.556	69.5826	87.9013	47.6507	-8.0244	56.1946	390.5715	3074.299
0.1162	70.7448	74.6921	97.6372	69.5793	87.9513	48.0034	-7.878	57.3364	390.7675	3078.2013
0.1163	70.7304	74.6582	97.6478	69.595	87.9475	46.4147	-7.4407	55.5406	390.1213	3095.2669
0.1164	70.7368	74.6739	97.6679	69.5624	87.9674	47.6829	-7.9127	56.8726	390.2484	3095.9357
0.1165	70.723	74.6601	97.7397	69.556	87.9838	46.8004	-7.5709	57.3124	390.2927	3107.862
0.1165	70.7097	74.6596	97.8548	69.555	88.0335	46.1743	-7.3728	55.6124	390.0712	3110.5229
0.1166	70.7253	74.6522	97.8192	69.5981	88.023	47.3857	-7.8706	56.795	390.9406	3111.7332
0.1167	70.7218	74.6741	97.8647	69.5825	87.9956	46.7488	-7.5368	55.9825	389.0461	3126.6766
0.1167	70.7279	74.668	97.9827	69.548	88.0342	45.7109	-7.7944	57.8171	389.348	3126.2856
0.1169	70.7225	74.6672	98.0225	69.5537	88.0043	46.427	-7.5652	56.625	390.4035	3142.9115
0.1169	70.7148	74.6647	98.0394	69.558	87.9884	46.1409	-7.3886	56.8246	388.4322	3144.2981
0.117	70.6976	74.6573	97.9938	69.5837	87.9363	47.3246	-7.8299	56.4102	390.4709	3155.61
0.1171	70.6964	74.6795	98.1589	69.5846	87.9793	47.0094	-8.0375	56.8172	389.9328	3163.6463
0.1172	70.6957	74.6558	98.3007	69.5647	88	47.0224	-7.864	56.614	390.8188	3176.6546
0.1173	70.6944	74.6647	98.3031	69.5621	88.0582	45.9588	-7.5483	56.7026	389.3625	3179.1713
0.1174	70.6763	74.6695	98.2999	69.5997	88.0195	45.7136	-7.7041	57.1646	388.9361	3183.2189
0.1175	70.7059	74.6924	98.4816	69.5598	87.9998	45.5501	-7.781	56.9687	389.0514	3195.1462
0.1176	70.6813	74.6678	98.6003	69.553	88.0488	45.5297	-7.6523	56.6188	389.883	3214.2282
0.1176	70.6964	74.6616	98.5238	69.5737	87.9887	45.8288	-7.649	55.4794	389.6449	3216.5132
0.1177	70.6844	74.6598	98.6054	69.5541	88.0757	45.4005	-7.6411	57.2976	389.7058	3223.4541
0.1178	70.6946	74.6598	98.5919	69.5762	88.0469	46.6676	-8.1755	57.342	390.5862	3231.4691
0.1178	70.6779	74.6741	98.6226	69.5732	88.0301	45.7109	-7.4708	56.9157	389.4169	3228.7639
0.118	70.6954	74.6989	98.9179	69.4875	88.1489	45.6857	-7.4435	56.2518	390.78	3249.7112
0.118	70.7174	74.6876	98.9369	69.5068	88.1352	45.4748	-7.8794	57.2681	389.7335	3249.2624
0.1181	70.6954	74.6657	98.9925	69.4941	88.1023	46.2078	-7.8715	55.9416	389.9051	3259.4254
0.1182	70.7205	74.6754	99.0876	69.4831	88.1446	46.3601	-7.6007	56.4144	389.9328	3264.4268
0.1184	70.7036	74.679	99.1811	69.5473	88.1753	46.2449	-8.1571	54.8622	389.4843	3283.1738
0.1185	70.7148	74.6902	99.2966	69.5136	88.2027	45.9904	-7.8094	56.7507	390.2706	3300.7267
0.1186	70.737	74.6843	99.3121	69.5216	88.1631	44.6776	-7.2607	56.1274	389.597	3301.1128
0.1187	70.7157	74.6704	99.3244	69.5439	88.1609	45.9153	-7.7527	56.8556	390.0154	3300.3231
0.1188	70.7061	74.6968	99.4364	69.5481	88.2242	46.2654	-7.5893	57.5859	389.6283	3317.3177
0.1189	70.7008	74.6915	99.4957	69.5238	88.2381	45.3513	-7.3381	56.784	389.7833	3317.494
0.119	70.7247	74.6819	99.5356	69.5283	88.2714	45.4746	-7.83	55.9047	389.687	3327.2786
0.119	70.7365	74.6736	99.6751	69.514	88.2411	46.2198	-7.8124	56.795	389.4123	3334.045
0.1192	70.7157	74.6826	99.9191	69.4331	88.3394	45.5865	-7.5666	57.4954	389.6552	3349.7338
0.1192	70.7335	74.6756	100.1169	69.3743	88.4268	44.3805	-7.1359	56.3405	390.2152	3352.5516
0.1193	70.7028	74.6843	100.2428	69.3336	88.4686	44.6473	-7.6703	56.0497	390.4815	3361.5326
0.1194	70.7031	74.6989	100.3779	69.3553	88.5194	44.6444	-7.8381	56.5474	389.8497	3368.5976
0.1195	70.7003	74.7063	100.5787	69.2881	88.6269	44.507	-7.3451	57.0925	390.2643	3384.5858
0.1196	70.6979	74.7136	100.5833	69.3099	88.6073	43.8663	-7.5291	56.5587	389.5864	3386.4104
0.1197	70.7106	74.7287	100.6798	69.2855	88.6364	44.0645	-8.0325	55.8376	389.7664	3394.4909
0.1197	70.7204	74.7187	100.7737	69.2584	88.7121	43.7173	-7.1119	56.71	390.4533	3401.956
0.1198	70.7086	74.7	100.8708	69.3277	88.7388	44.4945	-7.8606	56.6683	389.1362	3403.7674

0.1199	70.7187	74.6991	100.9691	69.3238	88.7769	44.9816	-7.2872	58.155	389.9882	3412.9205
0.1199	70.6732	74.6869	100.9338	69.3878	88.7668	44.0721	-8.0222	55.6642	388.9472	3418.0982
0.12	70.7106	74.7141	101.1917	69.2964	88.841	44.5389	-7.4505	57.8913	390.4709	3421.3007
0.1201	70.7074	74.7006	101.3721	69.2369	88.9061	43.1924	-7.5187	57.4565	390.625	3431.7959
0.1202	70.7123	74.7208	101.5096	69.2973	88.9709	43.7563	-7.2892	57.0981	390.2761	3439.0574
0.1203	70.6993	74.7199	101.6717	69.2629	89.0573	44.0689	-7.6993	57.2374	390.169	3456.1451
0.1204	70.7145	74.7131	101.8998	69.2402	89.2478	43.7437	-7.7269	56.6082	390.9635	3455.5931
0.1205	70.7091	74.7346	101.9629	69.2773	89.2556	44.2999	-7.5375	56.1769	390.0842	3477.4426
0.1206	70.6941	74.7078	101.9389	69.3113	89.2759	44.4038	-7.8357	56.8468	391.3503	3473.4338
0.1206	70.7076	74.7136	102.2254	69.248	89.4081	43.5491	-7.4718	56.845	389.0355	3486.4891
0.1207	70.7041	74.7101	102.3865	69.2341	89.493	42.7196	-7.4015	55.8342	388.4654	3490.9305
0.1208	70.7281	74.7136	102.4152	69.2505	89.4789	43.9012	-7.6659	55.6753	390.564	3489.9847
0.1208	70.7338	74.7056	102.5628	69.2654	89.573	43.1954	-7.4105	56.3112	390.8257	3491.3267
0.1209	70.7353	74.7284	102.7185	69.2492	89.6801	42.8729	-7.371	57.2976	389.8996	3506.9444
0.1211	70.7225	74.7106	103.0207	69.2929	89.8068	42.975	-7.5305	55.9709	389.894	3515.0316
0.1212	70.7421	74.726	103.1826	69.2544	89.8647	43.0515	-7.8367	57.7853	390.0419	3526.5927
0.1212	70.7472	74.7336	103.339	69.2641	89.9905	44.0236	-7.4996	57.2657	390.0313	3524.9981
0.1214	70.7516	74.6988	103.5091	69.2829	90.093	43.6569	-7.5205	57.1831	389.7833	3538.9083
0.1215	70.7309	74.7221	103.6936	69.2747	90.1704	43.0088	-7.3326	55.2614	388.5218	3540.7681
0.1215	70.7079	74.7317	103.8529	69.2538	90.2414	43.1153	-7.8804	56.9798	390.0214	3560.0037
0.1217	70.7201	74.7334	104.0767	69.285	90.3137	43.6824	-7.8629	56.2158	389.9677	3557.6574
0.1217	70.7164	74.7274	104.2823	69.3042	90.4556	43.0252	-7.2846	56.5918	391.1067	3573.6853
0.1218	70.6837	74.7385	104.3555	69.3165	90.4441	43.98	-7.8019	56.5834	388.9243	3574.8458
0.1219	70.7051	74.7289	104.6907	69.2439	90.6059	43.7145	-7.644	56.4661	389.1631	3573.7815
0.122	70.7174	74.7331	104.8152	69.2482	90.5992	42.7245	-7.2725	57.757	390.884	3590.7998
0.1221	70.7138	74.7246	104.9868	69.2981	90.6388	42.9218	-7.8249	58.0433	390.7463	3590.8995
0.1222	70.6818	74.7292	105.141	69.2763	90.6778	43.749	-7.65	56.0815	387.4837	3594.4031
0.1222	70.7146	74.7435	105.1969	69.3085	90.6851	43.3095	-7.7887	55.7122	391.3559	3591.2782
0.1223	70.6749	74.7541	105.3842	69.2717	90.7748	42.968	-7.3347	56.1168	388.919	3592.9387
0.1224	70.7153	74.7213	105.5435	69.3006	90.8214	42.3842	-7.2712	56.6805	389.9605	3594.8369
0.1224	70.72	74.733	105.6777	69.2453	90.8932	43.0679	-7.3767	56.189	386.6824	3593.7148
0.1225	70.6972	74.7568	105.8886	69.2199	90.9534	42.6987	-7.3646	56.64	390.6774	3593.8894
0.1226	70.7153	74.7213	105.9415	69.2861	91.0069	42.8747	-7.6321	58.4876	389.8608	3590.7573
0.1226	70.7306	74.7438	106.1194	69.2297	91.0647	42.3584	-7.2069	56.0779	389.3004	3594.0121
0.1227	70.7197	74.746	106.2912	69.284	91.1793	42.9342	-7.6369	56.2666	389.9882	3591.3263
0.1228	70.7712	74.7453	106.3557	69.3013	91.1742	43.5038	-7.5887	56.435	390.1478	3593.4064
0.1229	70.7206	74.7387	106.6004	69.2812	91.3165	43.3305	-7.3864	57.1066	390.455	3594.2804
0.123	70.7494	74.7285	106.7686	69.291	91.4229	42.5726	-7.1878	56.2547	390.4179	3593.3221
0.1231	70.7657	74.7333	106.8259	69.2987	91.462	43.3466	-7.6744	57.2348	390.6637	3594.1636
0.1232	70.7184	74.7414	107.0054	69.329	91.5427	43.1368	-7.6065	56.3537	390.6245	3594.587
0.1232	70.7286	74.7243	107.1864	69.3129	91.6352	42.7335	-7.2497	56.8505	389.7169	3589.3306
0.1233	70.704	74.7465	107.3537	69.3167	91.7289	42.5175	-7.5824	55.7563	390.4444	3592.7164
0.1234	70.6962	74.7531	107.4424	69.31	91.8019	43.2547	-7.6523	56.4735	390.5087	3593.6988
0.1235	70.7309	74.7547	107.6578	69.3145	91.91	43.459	-7.54	56.5585	389.8719	3593.3301
0.1236	70.6999	74.74	107.9101	69.3377	92.0471	43.4665	-7.6082	56.6188	389.4275	3593.1227
0.1237	70.7105	74.7521	108.0226	69.328	92.1002	42.6378	-7.2741	56.3627	391.2285	3593.3621
0.1238	70.7067	74.7541	108.1851	69.3414	92.203	42.8942	-7.5593	56.3749	390.3173	3591.6584
0.124	70.7179	74.7629	108.2949	69.326	92.2894	43.3518	-7.6182	56.0002	390.9317	3595.7677
0.1241	70.7077	74.757	108.4715	69.3274	92.355	43.4711	-7.5422	56.9503	392.2308	3593.1057
0.1242	70.7018	74.7395	108.6241	69.3458	92.454	42.8374	-7.1083	56.7178	389.8035	3593.2377
0.1242	70.7169	74.7611	108.705	69.3505	92.489	42.8766	-7.5527	56.7692	390.0878	3594.0354
0.1243	70.6915	74.756	108.8318	69.3127	92.5422	42.481	-7.1391	55.0387	391.5567	3590.8765
0.1244	70.7084	74.7475	108.9017	69.354	92.6138	42.8515	-7.5268	56.3959	388.6482	3591.9275

0.1244	70.7226	74.7651	108.9675	69.3629	92.6475	43.7934	-7.4908	57.2268	391.4984	3592.0724
0.1245	70.7531	74.7419	109.029	69.3473	92.6925	42.3789	-7.4254	55.7951	390.1425	3592.4558
0.1246	70.7263	74.7705	109.1826	69.3844	92.793	43.6671	-7.386	57.5785	390.4644	3594.4281
0.1247	70.7392	74.7524	109.2151	69.3485	92.8411	42.4055	-7.2878	57.3045	392.2982	3589.3738
0.1247	70.7123	74.7514	109.2049	69.3892	92.866	43.5501	-7.499	56.6768	391.295	3595.3739
0.1248	70.7204	74.7482	109.4047	69.3436	92.9474	42.9866	-7.1475	57.6474	390.4285	3592.5478
0.1249	70.7322	74.756	109.5455	69.4064	93.0346	42.6295	-7.2657	57.2126	388.9416	3591.663
0.125	70.7158	74.7269	109.6021	69.4052	93.1496	42.9899	-7.6703	56.795	390.6748	3593.9312
0.1251	70.7123	74.767	109.6701	69.3768	93.2002	43.6735	-7.3115	56.8097	391.4137	3592.3638
0.1252	70.7314	74.7705	109.8138	69.378	93.2769	42.6611	-7.2568	56.2037	388.3658	3593.3702
0.1253	70.7191	74.7763	109.8202	69.3536	93.3489	43.247	-7.817	56.0567	388.8343	3592.2641
0.1253	70.7069	74.7664	109.8911	69.3903	93.3395	42.6332	-7.4601	56.0744	390.2263	3589.2745
0.1254	70.7125	74.7593	109.9195	69.4295	93.3883	43.4832	-7.7887	57.7152	390.7412	3593.5866
0.1255	70.6786	74.7504	110.0496	69.404	93.4253	43.4371	-7.5504	56.891	389.9095	3592.5094
0.1257	70.7044	74.769	110.3021	69.3821	93.6068	42.3536	-7.259	56.7137	389.6061	3590.5409
0.1258	70.7116	74.7614	110.4388	69.38	93.677	42.6188	-7.6495	57.1419	390.4603	3591.9191
0.1259	70.6834	74.7633	110.4357	69.3624	93.696	43.1358	-7.3592	56.8468	390.6914	3592.6168
0.126	70.7074	74.7865	110.4971	69.4248	93.7551	43.0195	-7.7372	57.202	390.8152	3593.4064
0.126	70.7153	74.7697	110.513	69.39	93.7839	43.5287	-7.4533	56.8024	389.2905	3591.3103
0.1261	70.7008	74.7458	110.645	69.3725	93.8725	42.8356	-7.5289	56.6683	392.4306	3592.5631
0.1262	70.675	74.7677	110.6114	69.3855	93.8956	43.4683	-7.2929	57.2496	389.9494	3592.8332
0.1262	70.6658	74.7891	110.7102	69.4146	93.9723	42.9676	-7.4829	56.6435	390.2041	3594.0514
0.1263	70.6957	74.7724	110.7059	69.4175	93.9677	43.964	-7.623	57.1207	389.8724	3594.3877
0.1265	70.6972	74.7714	110.7846	69.417	94.0832	43.6433	-7.6553	56.5163	390.7887	3592.6704
0.1265	70.714	74.7638	110.941	69.371	94.1054	42.5486	-7.1937	56.898	390.0736	3593.1304
0.1266	70.7072	74.782	110.9395	69.4054	94.1325	43.7879	-7.6924	56.3663	389.2573	3591.0057
0.1267	70.7084	74.7756	110.9597	69.4798	94.2287	44.2579	-7.5108	56.3109	389.4566	3589.8917
0.1268	70.7419	74.777	111.0549	69.426	94.3264	42.8374	-7.4374	57.0394	389.634	3592.1491
0.1269	70.7153	74.7672	111.1847	69.4356	94.3643	43.2639	-7.7499	57.5046	389.8553	3595.398
0.1269	70.7321	74.7624	111.1735	69.4368	94.4434	43.4354	-7.1733	55.8835	390.026	3592.4328
0.127	70.7419	74.7835	111.1985	69.4701	94.454	44.1966	-7.6271	57.0389	389.7833	3593.0896
0.1271	70.7284	74.7853	111.2805	69.436	94.5113	42.9741	-7.1694	57.1572	389.8331	3590.9015
0.1272	70.723	74.7704	111.427	69.4165	94.5924	42.8214	-7.3011	56.4915	389.2951	3592.9847
0.1272	70.7396	74.7736	111.3951	69.3995	94.6217	43.4469	-7.3088	57.2644	391.2784	3592.8091
0.1273	70.7485	74.7714	111.4528	69.4379	94.6667	43.1341	-7.6156	55.9153	390.5027	3590.7691
0.1274	70.7261	74.7804	111.5044	69.4624	94.7343	44.1613	-7.5049	54.8844	389.6836	3594.3159
0.1274	70.7222	74.7562	111.5262	69.4539	94.8193	43.1813	-7.651	58.4063	390.5696	3594.4121
0.1275	70.7485	74.7934	111.5641	69.4463	94.8609	43.5642	-7.4723	55.3886	389.115	3591.1218
0.1276	70.7442	74.7756	111.6117	69.4414	94.9004	42.27	-7.2877	56.6398	389.213	3592.4805
0.1277	70.7255	74.7997	111.7215	69.4282	95.0508	42.5299	-7.4019	56.8415	390.2114	3590.7231
0.1278	70.7243	74.8067	111.8006	69.3809	95.1385	42.8682	-7.5301	56.03	389.3846	3590.5489
0.1279	70.7289	74.8036	111.8546	69.4795	95.1879	43.4999	-7.694	57.002	390.2374	3593.1538
0.128	70.7174	74.8228	111.8782	69.4448	95.2344	43.7117	-7.7414	56.3479	387.1586	3592.3843
0.1281	70.7025	74.7792	111.9666	69.4287	95.341	43.016	-7.0995	57.7853	390.9158	3593.0461
0.1282	70.7118	74.7916	111.9422	69.4767	95.3896	43.1125	-7.6181	55.3131	390.3979	3593.1938
0.1283	70.7102	74.785	111.9901	69.4975	95.4227	43.734	-7.3623	57.0094	390.3481	3592.4324
0.1283	70.7177	74.7821	111.9935	69.4488	95.4671	43.3065	-7.6175	58.6796	390.6933	3594.2881
0.1284	70.7133	74.7855	112.0169	69.5043	95.48	43.9114	-7.7901	56.5437	389.5784	3592.6248
0.1285	70.6998	74.7848	112.0466	69.5193	95.5453	44.1204	-7.6374	56.3811	389.6449	3593.6587
0.1287	70.6891	74.778	112.1482	69.5406	95.6326	44.0929	-7.4432	57.4495	390.1584	3590.4165
0.1287	70.7261	74.7881	112.1577	69.4945	95.7101	42.9397	-7.4781	55.7307	390.2097	3593.282
0.1288	70.6969	74.798	112.2264	69.5127	95.8054	43.9249	-7.9214	56.6329	389.8512	3590.3321
0.1289	70.7049	74.7924	112.2314	69.5135	95.8071	43.054	-7.3585	56.5548	390.1266	3594.5243

0.129	70.694	74.7829	112.2963	69.5644	95.8613	43.9525	-7.7399	55.325	389.9995	3589.8491
0.129	70.6998	74.7822	112.3191	69.5288	95.9585	43.8901	-7.531	56.7248	389.8276	3592.9854
0.1291	70.7082	74.7983	112.3547	69.56	95.9893	44.0647	-7.7585	56.4033	388.1055	3591.9996
0.1292	70.7277	74.7921	112.3977	69.5285	96.0382	43.1777	-7.4238	56.7354	390.6721	3592.9694
0.1292	70.7008	74.7883	112.4525	69.5549	96.0524	43.485	-7.8261	56.0744	389.3459	3592.4725
0.1293	70.7064	74.8026	112.4852	69.5786	96.1118	43.2185	-7.3243	56.8839	389.5705	3593.6057
0.1294	70.7056	74.8059	112.4984	69.5966	96.1414	43.6114	-7.9065	56.8542	390.7579	3594.4281
0.1294	70.735	74.7946	112.4915	69.5874	96.1616	44.0334	-7.8358	57.3823	389.205	3593.3911
0.1296	70.7204	74.7876	112.5999	69.5928	96.2563	43.9922	-7.6179	57.1202	390.8464	3592.7209
0.1297	70.7421	74.7895	112.6595	69.5926	96.3525	43.4798	-7.748	56.5516	390.1584	3590.4778
0.1297	70.7273	74.7919	112.664	69.5687	96.3662	43.3262	-7.4402	57.7189	390.2761	3589.9638
0.1298	70.7338	74.8177	112.6998	69.6067	96.4027	43.4096	-7.9134	58.3509	390.4338	3588.2468
0.1299	70.7061	74.809	112.6996	69.6331	96.4097	43.7702	-7.6393	57.1794	388.8087	3592.0477
0.1299	70.7465	74.7702	112.7656	69.6365	96.4609	43.9941	-7.8291	57.5268	390.5585	3591.0458
0.13	70.7338	74.8056	112.8335	69.5817	96.5421	43.6957	-7.565	57.5202	390.6351	3591.2061
0.1301	70.7355	74.8128	113.0848	69.4918	96.6789	43.0011	-7.6058	56.0929	389.1687	3592.4084
0.1301	70.705	74.8012	113.1046	69.5037	96.733	43.398	-7.3739	57.5308	390.1001	3592.5708
0.1302	70.7184	74.8048	113.1192	69.5382	96.7574	43.4265	-7.6898	56.4915	389.5493	3592.1568
0.1303	70.7194	74.7942	113.1929	69.5074	96.828	43.7191	-7.8228	57.5231	390.6969	3593.1938
0.1304	70.7174	74.8075	113.1778	69.538	96.9087	44.1585	-7.5746	56.8135	389.069	3591.3424
0.1305	70.7332	74.7978	113.2011	69.5312	96.912	43.0531	-7.588	55.9303	389.3514	3594.2358
0.1306	70.7108	74.7924	113.2431	69.5375	96.9786	42.7263	-7.5847	57.0147	389.2898	3591.7734
0.1307	70.7166	74.8041	113.2324	69.5606	97.0595	43.6838	-7.8774	56.2887	390.1432	3591.9355
0.1308	70.6842	74.8177	113.2464	69.5544	97.0711	42.9574	-7.3682	56.3811	389.739	3587.1185
0.1308	70.7072	74.8156	113.2769	69.6013	97.1212	43.7117	-7.8836	57.1773	390.2802	3591.4821
0.1309	70.7123	74.8304	113.3474	69.568	97.1753	43.5092	-7.4103	56.8837	388.853	3592.4324
0.131	70.7414	74.8229	113.3	69.6322	97.1927	43.8405	-7.9188	56.6082	390.0313	3593.1764
0.131	70.7062	74.8141	113.3605	69.5711	97.2389	44.3155	-7.4785	56.5881	390.8686	3592.8412
0.1311	70.6991	74.8392	113.3881	69.5852	97.3055	43.1866	-7.56	57.2621	391.027	3592.8697
0.1312	70.6942	74.8124	113.4062	69.5425	97.3044	43.5393	-7.5608	56.7354	389.401	3591.4821
0.1313	70.716	74.8243	113.5235	69.5742	97.478	43.1137	-7.311	56.4738	390.116	3587.7945
0.1314	70.6814	74.825	113.5583	69.5404	97.5036	43.5491	-7.7148	56.4403	389.5618	3592.9454
0.1315	70.7028	74.8331	113.5157	69.5613	97.5232	44.3488	-7.6203	57.7393	390.1531	3593.5137
0.1315	70.7	74.8488	113.5666	69.5386	97.6078	42.6889	-7.4162	57.2126	391.677	3593.5144
0.1316	70.7123	74.833	113.5358	69.5735	97.6196	44.2226	-7.5812	56.747	389.523	3595.0213
0.1318	70.7406	74.8294	113.5568	69.6448	97.6948	43.1786	-7.6216	57.2268	389.3162	3593.4217
0.1319	70.7306	74.8438	113.6112	69.5952	97.7544	43.3349	-7.1976	55.4204	390.0366	3591.3211
0.132	70.7401	74.8338	113.5782	69.6251	97.8056	43.8041	-7.8872	56.5445	390.3226	3591.3058
0.1321	70.7202	74.823	113.659	69.5818	97.8723	43.7349	-7.4169	58.9754	390.3149	3591.9114
0.1322	70.7421	74.8407	113.8624	69.5312	98.0434	43.1777	-7.3922	56.8132	388.1934	3591.8501
0.1322	70.7353	74.8483	113.7976	69.5902	98.0092	43.8482	-7.402	57.7448	389.8221	3594.6606
0.1323	70.7868	74.8414	113.8177	69.581	98.1118	43.6433	-7.711	56.9617	389.3162	3592.6628
0.1324	70.7483	74.8434	113.8457	69.5728	98.1559	43.9458	-7.6688	57.2016	389.0247	3593.4022
0.1324	70.7386	74.8261	113.8449	69.5797	98.1879	43.7693	-7.776	57.1831	390.0934	3591.4706
0.1325	70.7664	74.8386	113.9274	69.5693	98.2836	43.6587	-7.9445	57.6229	389.9771	3590.3084
0.1326	70.734	74.8277	113.8602	69.5803	98.3306	44.1897	-7.6935	56.6824	389.1521	3592.4788
0.1327	70.7243	74.8577	113.8606	69.6111	98.3626	43.131	-7.5939	56.2555	388.9416	3593.9793
0.1328	70.7478	74.8302	113.8667	69.5892	98.4494	43.4971	-7.7412	56.3183	390.6803	3591.7271
0.1329	70.7115	74.8296	113.9253	69.6055	98.5109	44.3183	-7.8524	56.2111	389.4898	3592.9534
0.133	70.6947	74.8409	113.903	69.616	98.5388	43.9328	-7.8206	55.9857	391.3171	3590.2523
0.1331	70.7328	74.8265	113.9668	69.5839	98.6259	43.1626	-7.4444	56.3289	390.0683	3592.1108
0.1332	70.6987	74.8475	114.0426	69.5897	98.7423	42.9853	-7.4463	57.6265	389.955	3591.8553
0.1333	70.7292	74.8473	114.0503	69.6643	98.7654	44.004	-7.8272	57.2621	389.6393	3595.3997

0.1334	70.6996	74.8568	114.1631	69.574	98.8523	43.8308	-7.8	56.4385	389.1309	3593.2377
0.1336	70.7253	74.8511	114.1372	69.5943	98.9131	44.2263	-7.7267	56.3811	388.6869	3592.9534
0.1336	70.7062	74.8702	114.1902	69.5435	98.9715	43.1032	-7.45	56.5437	390.2872	3590.9817
0.1338	70.7231	74.8631	114.242	69.6081	99.0451	42.984	-7.4964	56.7213	390.4444	3593.0997
0.1339	70.7051	74.8462	114.1823	69.6428	99.0694	43.8129	-7.9008	57.3605	389.213	3593.0736
0.134	70.7145	74.8399	114.1853	69.5967	99.0917	43.972	-7.4432	57.3894	389.6499	3593.2991
0.134	70.7179	74.8702	114.2495	69.606	99.125	43.032	-7.4117	55.735	389.6128	3592.1108
0.1342	70.7277	74.8702	114.2569	69.6184	99.2312	43.438	-7.6789	59.1286	390.0154	3591.1064
0.1342	70.7358	74.859	114.2915	69.5881	99.2674	44.2217	-7.7708	56.3405	389.1188	3591.126
0.1343	70.749	74.8304	114.2131	69.6495	99.2835	43.2425	-7.7472	57.4424	390.4656	3594.5487
0.1344	70.7468	74.8502	114.2612	69.6546	99.3585	44.1142	-7.5783	55.6643	389.7241	3591.0221
0.1344	70.7321	74.8477	114.262	69.6407	99.3881	42.9031	-7.6629	56.7354	389.4169	3591.7351
0.1346	70.7514	74.8796	114.282	69.65	99.4393	43.0744	-7.439	56.9576	389.1078	3592.4244
0.1347	70.7524	74.8551	114.3286	69.649	99.5567	43.0326	-7.7216	58.1883	390.0602	3592.1599
0.1348	70.7465	74.8646	114.3372	69.649	99.5939	43.8334	-8.0956	57.9267	390.1478	3593.9354
0.1349	70.7272	74.8673	114.3153	69.6853	99.6081	43.566	-7.4634	56.4774	388.8237	3591.1601
0.1349	70.7394	74.8804	114.3516	69.6903	99.6403	43.7609	-8.0004	56.7285	389.6781	3593.0496
0.135	70.7255	74.8802	114.3351	69.6713	99.7099	44.2164	-7.835	57.5767	390.2008	3591.2138
0.1351	70.7604	74.8712	114.4134	69.6754	99.7887	43.0782	-7.6237	56.5657	390.1796	3592.6244
0.1352	70.7453	74.8829	114.3501	69.6988	99.7949	44.1684	-8.0192	56.9228	389.5122	3591.4974
0.1355	70.7164	74.8753	114.4686	69.6948	99.9344	43.2556	-7.6205	56.2813	389.5175	3592.0797
0.1356	70.6994	74.8687	114.5164	69.7194	100.02	44.2288	-7.8824	57.8489	389.6393	3592.1184
0.1356	70.7099	74.8768	114.5075	69.6664	100.0858	42.9555	-7.983	56.9546	389.2739	3592.1644
0.1357	70.7256	74.8615	114.6066	69.6848	100.1437	43.145	-7.9202	57.5859	389.6781	3594.7648
0.1358	70.7072	74.8838	114.5784	69.702	100.1474	43.8388	-8.1941	57.4071	389.3851	3591.3824
0.1359	70.7106	74.8677	114.5997	69.714	100.2363	44.0485	-8.1348	56.5233	392.0757	3591.6201
0.136	70.7008	74.8801	114.6263	69.7203	100.2467	43.5426	-7.4571	56.3146	389.4677	3594.2117
0.1361	70.7018	74.8882	114.7044	69.7182	100.332	43.2994	-7.6365	57.1278	389.0885	3592.1031
0.1363	70.7304	74.8944	114.7197	69.7286	100.4136	43.7182	-7.7931	57.6561	389.8442	3592.8011
0.1363	70.7162	74.8855	114.7248	69.7121	100.444	44.562	-7.6676	56.1451	389.2527	3593.5751
0.1364	70.7097	74.8967	114.7378	69.7369	100.4545	43.7786	-7.808	57.2976	390.5198	3592.1439
0.1365	70.7218	74.8838	114.7734	69.725	100.5194	43.9632	-7.6973	57.9762	389.8512	3591.3671
0.1367	70.7272	74.8917	114.9094	69.7049	100.6514	43.0648	-7.4027	55.6149	390.6033	3593.6211
0.1367	70.7376	74.8913	114.877	69.7052	100.6927	43.8566	-7.9919	56.7396	390.1045	3595.2377
0.1369	70.7538	74.8914	114.8958	69.7106	100.7533	44.1453	-7.9376	57.7181	390.2749	3591.6508
0.1369	70.7294	74.8963	114.89	69.7488	100.7644	43.8183	-7.3697	56.8026	390.5609	3592.2948
0.137	70.7266	74.8957	114.9406	69.7548	100.7869	44.1725	-7.7299	56.3146	389.6504	3593.843
0.1371	70.7363	74.8811	114.9286	69.7612	100.808	44.0876	-7.7937	57.1596	389.5864	3594.61
0.1372	70.7279	74.8715	115.0083	69.7165	100.9406	43.3633	-7.5329	56.6953	390.337	3596.5361
0.1373	70.7277	74.8799	115.001	69.7446	100.9627	43.9623	-7.8306	56.5587	389.5228	3591.1601
0.1374	70.7465	74.9036	114.9952	69.7387	101.0098	43.7099	-7.6224	57.6863	391.5302	3589.1362
0.1374	70.747	74.888	115.0702	69.7517	101.0306	44.4316	-7.6137	56.9909	390.1211	3593.9152
0.1375	70.7289	74.9007	115.1223	69.7072	101.1449	43.4442	-7.1767	57.4636	390.1796	3593.4217
0.1376	70.7174	74.9145	115.1737	69.7141	101.1447	44.1706	-7.6624	57.1572	390.7191	3593.1377
0.1377	70.7382	74.9051	115.1925	69.7103	101.2251	44.3204	-7.8248	58.0469	387.6267	3590.5008
0.1378	70.7165	74.9126	115.2854	69.7025	101.2824	43.3296	-7.2507	56.7884	389.5917	3593.2761
0.1378	70.7396	74.9138	115.1777	69.7081	101.2746	44.0767	-7.6029	57.2311	390.636	3591.5187
0.1379	70.7409	74.8819	115.2605	69.7108	101.305	43.1998	-7.3217	56.5733	390.6969	3593.298
0.138	70.7542	74.8875	115.2195	69.7175	101.3443	44.4697	-7.6137	57.9591	389.0025	3593.8671
0.1381	70.737	74.9014	115.2799	69.7287	101.4021	44.2093	-7.4686	56.693	389.9095	3594.0887
0.1382	70.6957	74.9236	115.2799	69.7336	101.431	43.2523	-7.3104	57.4954	389.6711	3593.5137
0.1383	70.7368	74.9059	115.3644	69.7402	101.5153	43.2862	-7.5121	56.4624	390.5142	3593.3141
0.1384	70.745	74.9242	115.3018	69.7658	101.4976	44.3267	-7.7563	58.0848	390.0103	3591.9114

0.1385	70.7279	74.9046	115.3647	69.7345	101.5572	43.797	-7.4788	56.1946	389.6234	3593.0461
0.1386	70.736	74.9077	115.3998	69.738	101.649	43.5854	-7.6813	56.3884	388.8863	3592.1599
0.1386	70.7401	74.9117	115.4886	69.6983	101.688	44.2208	-7.6049	56.2629	388.9139	3592.7851
0.1387	70.7631	74.9372	115.5832	69.6697	101.7881	43.0912	-7.3587	56.7026	389.8221	3592.0477
0.1388	70.743	74.9375	115.6734	69.6211	101.8234	43.6457	-7.8199	57.5637	390.4367	3592.3442
0.1389	70.7284	74.9294	115.6488	69.6286	101.867	43.3332	-7.4502	56.283	388.9031	3594.2114
0.139	70.7172	74.9377	115.6893	69.6651	101.8957	44.0769	-7.5658	57.8206	391.1647	3593.1534
0.139	70.7543	74.9455	115.6467	69.6729	101.9154	43.6113	-7.1408	57.3258	389.491	3592.1031
0.1391	70.7447	74.9367	115.6766	69.6858	101.9248	44.4483	-7.5917	56.4255	389.8664	3591.9836
0.1392	70.734	74.9184	115.6436	69.7134	101.9344	44.1111	-7.554	56.8653	389.3735	3591.663
0.1393	70.7074	74.928	115.6707	69.7317	101.9925	43.0933	-7.2057	56.7248	390.0048	3592.1184
0.1394	70.71	74.9199	115.729	69.7342	102.0304	43.0233	-7.2907	57.4196	389.4234	3590.8294
0.1395	70.7355	74.9377	115.7122	69.7221	102.0638	44.0666	-7.66	57.8076	390.1543	3593.1057
0.1396	70.7123	74.9572	115.7725	69.7353	102.1574	44.4305	-7.6567	57.3505	389.1944	3592.1798
0.1397	70.6991	74.9538	115.8329	69.7115	102.2254	43.1679	-7.4625	56.7496	389.8777	3591.8041
0.1398	70.6923	74.9421	115.8026	69.7465	102.219	44.1924	-7.8174	57.3116	389.5069	3591.5358
0.1399	70.6928	74.9499	115.822	69.7199	102.2553	44.0751	-7.3391	57.05	389.8989	3591.3748
0.1399	70.696	74.9212	115.8951	69.7325	102.3106	44.113	-7.7271	56.8763	389.8276	3591.0378
0.14	70.7113	74.9416	115.8543	69.7358	102.2951	44.132	-7.4801	58.0257	390.3544	3593.4754
0.1401	70.7097	74.9681	115.8994	69.7548	102.3853	43.5538	-7.5104	56.7063	389.512	3590.9015
0.1402	70.7233	74.9281	115.9144	69.7625	102.4357	43.2398	-7.402	57.4492	389.4898	3594.3159
0.1403	70.709	74.9265	115.9041	69.7648	102.4832	43.6569	-7.7389	56.6657	388.7257	3593.9312
0.1404	70.7082	74.9716	115.9056	69.7688	102.4872	43.8352	-7.5834	57.135	389.7002	3591.4546
0.1405	70.7326	74.9385	115.9151	69.7759	102.556	43.9107	-7.4045	57.3505	389.0832	3590.8765
0.1406	70.7133	74.9753	115.9948	69.7619	102.6096	43.8414	-7.941	57.5591	390.4709	3592.6321
0.1407	70.7223	74.938	116.0202	69.7952	102.6833	44.3506	-7.6158	56.5127	390.0789	3594.3954
0.1408	70.7282	74.9482	116.0245	69.7829	102.6846	43.9885	-7.8973	55.8083	389.3791	3593.5064
0.1408	70.7187	74.9566	116.0438	69.7464	102.7042	44.0981	-7.5215	57.2866	388.7811	3592.6729
0.1409	70.7299	74.9576	116.273	69.7095	102.8314	43.4748	-7.6543	57.1905	389.4289	3591.2221
0.141	70.7172	74.9627	116.2604	69.7044	102.8918	43.9384	-7.5345	55.897	389.8996	3591.8553
0.141	70.7409	74.9663	116.2588	69.7015	102.9015	43.2194	-7.5903	56.2052	389.1732	3593.0997
0.1411	70.7292	74.9546	116.2586	69.7087	102.9567	44.2351	-7.8473	55.5229	388.4264	3594.1041
0.1412	70.747	74.9518	116.2508	69.7277	102.9651	43.8018	-7.7865	57.8815	389.9439	3592.2881
0.1413	70.7355	74.9607	116.244	69.7617	102.9809	44.2616	-7.6435	56.5105	388.471	3593.7228
0.1415	70.7546	74.9726	116.2806	69.7677	103.0943	43.9338	-7.8176	56.9793	390.2855	3590.7461
0.1415	70.7392	74.9572	116.2749	69.7545	103.1005	44.483	-7.9513	58.3898	389.0832	3590.5008
0.1417	70.7559	74.9714	116.3095	69.7929	103.1575	44.7865	-7.7679	58.2511	389.224	3592.0397
0.1418	70.7475	74.9854	116.3954	69.7425	103.2287	44.596	-7.6742	58.2511	387.4189	3591.7271
0.1419	70.738	74.9755	116.3845	69.7125	103.2925	43.9081	-7.5361	57.2268	387.8544	3592.9924
0.1419	70.7502	74.978	116.4166	69.76	103.3633	44.3435	-7.8924	57.6227	388.5271	3593.8741
0.1422	70.7387	74.986	116.4233	69.7081	103.4229	44.6216	-7.7404	60.189	389.7082	3590.2401
0.1422	70.7436	74.9689	116.4161	69.8377	103.435	45.3813	-7.7975	57.0147	387.8385	3591.4744
0.1423	70.7585	74.9765	116.4484	69.7852	103.506	45.073	-7.5404	59.277	387.5366	3593.3451
0.1424	70.7441	74.9694	116.4364	69.7851	103.5156	46.1526	-8.2371	59.3407	387.7432	3593.4601
0.1424	70.7442	74.9872	116.4209	69.7916	103.4958	45.9263	-7.7887	59.9215	388.2938	3591.5427
0.1425	70.7209	74.9609	116.6856	69.7022	103.6385	47.2259	-8.1543	61.3131	387.3512	3593.5367
0.1426	70.7335	74.9637	116.7508	69.7223	103.659	47.8752	-7.85	61.7102	384.5783	3590.9737
0.1426	70.7324	75.0138	116.658	69.7279	103.6854	48.8315	-8.2238	63.222	385.0737	3590.9148
0.1427	70.6933	74.9943	116.6851	69.6994	103.7439	49.3194	-7.875	64.1305	384.9996	3595.7064
0.1428	70.7172	74.9865	116.7026	69.7049	103.747	49.6579	-8.1113	63.8583	382.4096	3593.5521
0.1428	70.7026	74.9762	116.6739	69.7126	103.7727	49.5752	-7.807	64.6001	381.8097	3592.6168
0.1429	70.7302	74.9732	116.6558	69.7504	103.7973	51.0215	-8.2141	64.748	382.0422	3591.8874
0.143	70.7016	75.0002	116.6614	69.746	103.8139	52.4142	-8.414	65.8484	381.0219	3594.0044

0.1431	70.705	74.9719	116.6908	69.7321	103.9228	53.6066	-7.8877	67.7184	379.5548	3593.5597
0.1432	70.724	74.9763	116.6928	69.7683	103.8887	53.4298	-8.0738	68.4298	379.5972	3592.8314
0.1433	70.7166	74.9954	116.6556	69.7706	103.8851	54.3583	-7.7797	69.2677	379.772	3590.3886
0.1433	70.7343	75.0155	116.6931	69.7374	103.9505	54.7011	-8.0536	69.7038	378.587	3593.5385
0.1434	70.7126	75.0193	116.7912	69.7225	104.0289	56.3221	-8.0215	70.672	377.4076	3592.9133
0.1435	70.7116	74.9882	116.7928	69.7604	104.0758	57.2923	-8.0724	72.2325	377.2349	3592.6474
0.1436	70.7126	74.9913	116.864	69.7663	104.1499	56.8646	-7.8342	72.4754	377.2525	3594.3801
0.1437	70.7241	75.0028	116.7819	69.7617	104.1755	57.0745	-8.0329	72.3831	376.1118	3593.7148
0.1439	70.7055	75.0187	116.8004	69.7804	104.2206	57.0053	-8.1756	71.8331	376.1544	3592.2334
0.144	70.6965	74.995	116.8115	69.7942	104.2557	58.1071	-7.8989	71.6705	376.4616	3591.7198
0.144	70.7255	75.007	116.826	69.7993	104.3449	56.5948	-7.6075	72.4269	377.7328	3591.9651
0.1441	70.7404	75.0089	116.7749	69.8133	104.3344	57.7601	-8.1777	71.522	376.2558	3593.8671
0.1442	70.7114	75.005	116.7603	69.781	104.3414	57.853	-8.0338	72.335	377.5209	3592.1491
0.1443	70.7149	75.0216	116.8107	69.7936	104.3805	56.0165	-7.6733	72.1761	376.7099	3595.5182
0.1444	70.7314	75.0299	116.7868	69.8497	104.3945	56.9893	-8.2136	74.0459	376.1915	3595.9287
0.1444	70.7265	75.0299	116.7675	69.8079	104.4352	57.8059	-8.0346	71.6811	376.271	3593.6211
0.1445	70.7348	75.0262	116.8114	69.8378	104.4516	57.1897	-8.1029	70.794	377.546	3592.3282
0.1446	70.7378	75.0216	116.7977	69.8212	104.5031	56.9491	-7.8035	73.3809	377.4297	3594.5724
0.1447	70.7294	75.0255	116.8582	69.7979	104.5383	56.5522	-7.716	72.1866	376.7635	3592.5938
0.1447	70.7353	75.0241	116.8436	69.7903	104.5958	56.8161	-7.9394	70.9423	376.8536	3592.5631
0.1448	70.7126	75.0184	116.8677	69.8052	104.596	56.7308	-7.9529	72.2219	376.4828	3591.9268
0.1449	70.7519	75.0305	116.8673	69.8233	104.6636	56.1363	-7.9917	70.9603	374.9379	3592.2
0.145	70.7404	75.0219	117.0558	69.7798	104.8211	57.1306	-7.9188	70.3661	380.5347	3589.0825
0.1451	70.743	75.0267	117.2252	69.688	104.9151	56.0415	-7.9302	70.1805	388.543	3593.7308
0.1451	70.7567	75.0354	117.2532	69.6706	105.0162	57.1767	-8.0592	71.2522	389.7667	3591.8072
0.1452	70.7712	75.0526	117.4384	69.6035	105.1671	55.7187	-7.8133	71.4831	396.8108	3593.9737
0.1453	70.756	75.0372	117.4289	69.6354	105.1952	56.3667	-8.3583	71.182	403.931	3595.1655
0.1453	70.7509	75.0397	117.278	69.6719	105.1526	55.732	-8.2166	71.0695	405.5129	3590.0715
0.1454	70.7979	75.0382	117.0649	69.8182	105.0205	56.5385	-8.4155	71.1709	411.1737	3593.258
0.1455	70.7534	75.0348	117.0761	69.8103	105.0122	56.4296	-7.9605	71.5679	411.7893	3592.2871
0.1456	70.7846	75.0197	117.1041	69.7998	105.0956	57.0551	-8.4772	70.207	410.248	3593.6057
0.1456	70.7495	75.0431	117.0902	69.8247	105.1178	56.3371	-8.0979	70.0762	411.1484	3590.7615
0.1457	70.778	75.035	117.1243	69.7861	105.1447	56.4562	-8.3373	71.727	412.1653	3593.6517
0.1458	70.757	75.0433	117.0601	69.8082	105.1187	55.8205	-7.8339	71.1413	411.5724	3591.4145
0.1458	70.7568	75.0163	117.086	69.8057	105.1687	56.0484	-8.2287	69.7404	412.4355	3592.7087
0.1459	70.7396	75.0438	117.0308	69.8345	105.1848	57.082	-8.1161	69.8738	411.6333	3590.7412
0.146	70.7631	75.0543	117.0752	69.8363	105.2205	56.4464	-8.4166	73.4697	412.2501	3590.7308
0.146	70.7702	75.0589	117.1606	69.8282	105.2606	56.625	-8.057	70.3802	412.1177	3594.7174
0.1461	70.7473	75.0591	117.3063	69.7709	105.3837	55.5845	-8.0987	71.3483	413.2557	3590.2844
0.1462	70.758	75.0516	117.1989	69.8111	105.3519	56.6561	-7.9858	71.1225	411.784	3592.8314
0.1463	70.7514	75.0402	117.1952	69.8133	105.4203	55.5501	-7.9814	70.8605	413.1726	3592.7209
0.1463	70.7429	75.0511	117.2386	69.8198	105.411	56.2901	-8.3328	71.3276	411.2437	3593.8357
0.1464	70.7331	75.0487	117.2654	69.7909	105.498	55.8093	-7.8068	70.5142	410.301	3591.4974
0.1465	70.7329	75.0558	117.2271	69.8301	105.5125	56.7956	-8.228	71.2286	411.1643	3594.0811
0.1465	70.7304	75.0411	117.2592	69.8091	105.5687	55.7996	-7.817	71.2533	410.1897	3592.5248
0.1466	70.7197	75.0494	117.2132	69.8496	105.5942	56.9928	-8.1907	70.7348	410.1105	3594.0755
0.1467	70.7299	75.0382	117.2065	69.8311	105.5855	55.7063	-7.6738	71.3664	407.0224	3593.7284
0.1467	70.732	75.0642	117.3608	69.7806	105.7576	56.3546	-8.2977	71.012	412.7684	3593.1057
0.1468	70.7211	75.0538	117.3004	69.7998	105.7351	55.4255	-7.9594	70.5322	410.7988	3593.4677
0.1469	70.727	75.045	117.3965	69.8125	105.8412	56.0262	-8.644	70.8574	410.4757	3593.5061
0.1469	70.7309	75.0587	117.4261	69.7572	105.8518	56.7974	-8.1805	70.6524	410.9577	3592.3484
0.147	70.7093	75.0772	117.4394	69.7663	105.8943	56.3072	-8.5513	71.1044	410.4372	3592.5526
0.1471	70.717	75.057	117.4073	69.7673	105.9002	56.3318	-8.588	70.9529	411.2914	3590.3628

0.1472	70.7448	75.0458	117.4193	69.8137	105.9987	56.4073	-8.0329	71.9957	412.6367	3594.1577
0.1473	70.7309	75.0562	117.4197	69.7971	106.0256	56.4358	-8.4177	70.9069	409.6177	3592.2488
0.1474	70.725	75.0528	117.4321	69.8073	106.0861	56.6286	-8.3224	71.013	409.5542	3591.5588
0.1475	70.7281	75.0527	117.4241	69.8401	106.0849	56.7791	-8.3157	69.4229	409.9112	3590.3485
0.1476	70.7593	75.0609	117.4601	69.8054	106.1035	56.4215	-8.1953	70.8235	408.9034	3594.2678
0.1476	70.7519	75.0739	117.4409	69.8087	106.1646	56.6008	-8.0588	71.6365	410.1825	3591.5668
0.1477	70.7385	75.0736	117.4661	69.8127	106.1828	55.0958	-8.0816	72.0345	409.7607	3590.7001
0.1478	70.739	75.0521	117.4292	69.8606	106.1625	56.6055	-8.1805	69.1395	409.4164	3591.5818
0.1478	70.7399	75.0644	117.4266	69.8453	106.2206	56.0908	-8.2822	70.5574	409.291	3592.4725
0.1479	70.7493	75.0611	117.3903	69.867	106.2168	56.1437	-8.3613	71.7992	410.3597	3591.0378
0.148	70.7404	75.0599	117.4375	69.8692	106.2567	56.3778	-7.9066	71.5294	410.9799	3590.9096
0.1481	70.779	75.0604	117.4324	69.8492	106.2378	56.2981	-8.4618	69.9984	410.2109	3592.3024
0.1481	70.7544	75.087	117.4888	69.858	106.2873	56.2048	-8.0324	69.9702	409.2205	3590.9531
0.1482	70.7473	75.0726	117.4611	69.8712	106.3027	55.3393	-8.1913	69.0122	409.0192	3591.7658
0.1483	70.7366	75.0841	117.4593	69.8454	106.374	56.8144	-8.3341	71.7511	409.59	3592.3442
0.1483	70.7427	75.0953	117.5474	69.8511	106.3695	55.4433	-8.1556	71.2485	410.4317	3592.224
0.1484	70.7338	75.0787	117.3958	69.9109	106.3555	56.742	-8.5917	72.2944	408.5047	3592.1599
0.1485	70.7619	75.0813	117.5079	69.8721	106.3977	55.5501	-8.3082	70.7496	409.2135	3593.282
0.1485	70.7226	75.0577	117.5116	69.847	106.4519	56.5442	-8.5593	71.1473	409.3476	3593.7514
0.1486	70.7432	75.0983	117.5294	69.8737	106.5073	56.4493	-8.5629	70.4761	408.0451	3589.8596
0.1487	70.7675	75.0818	117.5436	69.9137	106.5241	55.7452	-8.2437	70.4798	409.0031	3593.0896
0.1488	70.7641	75.0918	117.523	69.91	106.5883	55.9311	-8.4939	71.0448	407.033	3593.2301
0.1489	70.7556	75.0736	117.4874	69.8981	106.567	55.6476	-8.1923	72.0522	409.5859	3592.1108
0.149	70.7636	75.0865	117.5745	69.9161	106.6424	56.0173	-8.5099	71.8896	409.3423	3593.8357
0.149	70.7715	75.0918	117.5441	69.9095	106.6023	56.9414	-8.4474	70.6877	408.4525	3592.1951
0.1492	70.7509	75.1006	117.5891	69.9115	106.6787	56.7068	-8.3519	69.7227	407.8699	3592.3561
0.1492	70.7698	75.0917	117.6007	69.8801	106.7974	55.1377	-8.0209	71.4629	407.6908	3592.737
0.1493	70.7276	75.0777	117.6462	69.8728	106.7878	56.6844	-8.3967	70.9566	409.147	3592.745
0.1494	70.7421	75.1016	117.664	69.8756	106.8332	55.5765	-8.1331	70.7736	409.5383	3594.6024
0.1494	70.7539	75.104	117.6969	69.917	106.889	56.2088	-8.5919	71.0489	407.4305	3593.6347
0.1495	70.7553	75.0928	117.6829	69.9242	106.8978	55.6005	-8.261	71.1897	408.2353	3593.3987
0.1496	70.7361	75.0938	117.7003	69.8924	106.9451	55.9552	-8.2885	72.3387	408.7539	3593.2499
0.1497	70.7153	75.104	117.714	69.89	106.9603	56.9387	-8.3857	70.8044	408.5796	3594.0504
0.1498	70.7545	75.1172	117.6919	69.9324	107.002	56.9017	-8.2514	71.3483	408.3331	3593.819
0.15	70.7236	75.0915	117.6985	69.9442	107.0764	56.0425	-8.6253	70.4392	407.9399	3592.8893
0.1501	70.698	75.1093	117.7459	69.9058	107.1039	56.5766	-8.1999	71.9137	408.9256	3591.7271
0.1501	70.7233	75.1014	117.7875	69.9099	107.118	56.5153	-8.514	70.5168	408.322	3592.3603
0.1502	70.704	75.1148	117.8154	69.8689	107.1654	56.211	-8.1913	70.4827	407.4462	3589.6958
0.1503	70.7053	75.1209	117.8247	69.8883	107.2084	55.2629	-8.4521	72.3209	407.5786	3593.8894
0.1503	70.7333	75.1164	117.7583	69.9312	107.1439	56.6667	-8.2488	70.9713	408.0673	3594.1957
0.1504	70.7276	75.1312	117.8388	69.9061	107.275	55.5966	-8.201	70.5648	408.549	3592.1118
0.1505	70.7277	75.1165	117.8431	69.9609	107.2461	56.6366	-8.3442	71.1473	407.1178	3592.6321
0.1506	70.7158	75.0972	117.8871	69.8909	107.3071	55.3064	-8.4609	72.1724	408.2459	3592.3101
0.1506	70.7248	75.1135	117.8022	69.9558	107.2579	56.952	-8.668	71.1508	407.0913	3592.2258
0.1507	70.7307	75.1114	117.871	69.9339	107.3501	56.7355	-8.5693	70.3948	408.2445	3594.1476
0.1508	70.7289	75.1351	118.0951	69.8128	107.4997	55.5622	-8.0687	71.4481	406.9764	3594.2358
0.1509	70.7417	75.1172	118.1353	69.8513	107.5753	56.0527	-8.2508	70.0659	407.3696	3595.4621
0.151	70.7506	75.1057	118.0981	69.8669	107.5479	55.7917	-7.7043	70.7422	407.0097	3591.3664
0.1511	70.743	75.1287	118.0828	69.8667	107.6179	55.3959	-7.6777	71.2374	407.1592	3598.2753
0.1511	70.7601	75.1203	118.1001	69.8767	107.6654	55.7675	-8.4186	71.0009	407.9067	3593.5385
0.1513	70.759	75.1184	118.1154	69.8895	107.8196	55.7027	-7.8195	71.2604	407.6474	3597.807
0.1515	70.7729	75.1421	118.1785	69.9051	107.895	55.7063	-7.7608	70.1504	406.6623	3591.9804
0.1515	70.7773	75.1465	118.0699	69.9531	107.9084	56.6028	-7.8186	71.0271	409.9673	3591.7121

0.1516	70.779	75.134	118.1113	69.9342	107.9303	56.0527	-7.4531	70.6572	408.6598	3593.3942
0.1517	70.7568	75.1479	118.0389	69.9189	107.9565	57.056	-7.6066	71.1367	407.0118	3590.0408
0.1517	70.7608	75.144	118.1096	69.9222	108.0089	55.552	-7.441	70.8272	405.7084	3592.9534
0.1518	70.779	75.1442	118.1086	69.9339	108.033	56.8274	-7.8969	72.1983	407.7627	3592.5606
0.1519	70.7561	75.1252	118.1672	69.9328	108.1286	55.5366	-7.6228	71.6775	406.6199	3591.8424
0.1519	70.7634	75.1338	118.1186	69.939	108.1459	56.702	-8.0011	72.0135	407.9455	3592.761
0.152	70.7495	75.1504	118.1237	69.9616	108.1521	55.6503	-7.5019	70.002	408.0658	3592.1798
0.1521	70.7529	75.1641	118.0971	69.9656	108.182	56.5311	-7.9274	71.1303	407.0706	3592.6007
0.1522	70.769	75.1431	118.1118	69.9665	108.289	56.7681	-7.771	71.5609	407.3349	3594.4031
0.1523	70.7491	75.1425	118.1611	69.9467	108.3617	56.5571	-7.964	71.2744	406.085	3592.8011
0.1524	70.7509	75.1621	118.1506	69.9411	108.3889	56.0007	-7.5597	71.3076	406.312	3591.6389
0.1525	70.7329	75.1533	118.1661	69.9609	108.4419	55.8653	-7.356	71.4053	406.7629	3590.8611
0.1526	70.7412	75.16	118.2131	69.9717	108.4591	56.3843	-7.9539	70.8826	407.1038	3592.5526
0.1527	70.7328	75.1363	118.1953	69.9945	108.5141	56.4326	-7.9287	71.6218	406.1126	3596.6403
0.1528	70.7526	75.156	118.2895	69.9404	108.6115	56.3771	-7.4857	71.4796	406.6305	3590.4165
0.1529	70.7338	75.1526	118.2844	69.9501	108.6763	55.6384	-7.6371	70.9196	406.8048	3592.4164
0.153	70.7336	75.1516	118.2395	69.9895	108.6765	56.3087	-7.991	71.6104	405.6559	3593.4217
0.1531	70.7605	75.1784	118.2342	69.9914	108.7144	57.0187	-7.7237	71.0554	406.6729	3593.9891
0.1532	70.7045	75.1421	118.2971	69.9555	108.7991	55.5668	-7.6186	70.5357	407.1813	3591.0834
0.1533	70.7156	75.16	118.2901	69.9789	108.7974	56.8897	-7.9526	72.1798	407.5246	3592.6087
0.1533	70.7426	75.1825	118.3947	69.9574	108.9066	55.5143	-7.7068	72.3633	405.8731	3592.1568
0.1534	70.7427	75.1667	118.3549	69.9582	108.9076	55.2064	-7.9811	70.5574	406.766	3592.4404
0.1535	70.7223	75.1769	118.3239	69.9726	108.9292	55.4851	-7.5341	71.0305	406.4559	3593.819
0.1535	70.7282	75.1706	118.3495	69.9479	109.0005	56.0688	-7.9373	71.0837	406.2915	3592.5708
0.1537	70.7084	75.1752	118.3963	69.9591	109.1003	56.4607	-8.1918	72.2007	406.3551	3591.6354
0.1537	70.7287	75.1807	118.4169	69.9781	109.1405	56.9352	-7.7988	71.4555	407.0318	3592.2481
0.1538	70.717	75.2081	118.442	69.9457	109.1711	55.5996	-7.8351	72.2997	406.7205	3594.817
0.1539	70.7343	75.1694	118.4112	70.0012	109.2065	57.136	-7.9269	71.0695	405.9896	3592.4864
0.1542	70.7407	75.1465	118.4195	70.0489	109.3804	57.6877	-8.1013	71.9002	406.3445	3592.9541
0.1542	70.744	75.1628	118.4304	70.0124	109.43	57.0977	-7.6756	72.6824	404.457	3592.2721
0.1543	70.7619	75.1858	118.5073	69.9837	109.4746	58.3323	-8.0057	72.9004	405.2045	3593.5144
0.1544	70.7343	75.1582	118.5103	69.9817	109.5177	58.6426	-8.0649	74.5487	404.7837	3591.2943
0.1546	70.7509	75.1774	118.5106	69.9921	109.5857	59.9747	-8.1009	73.3033	403.7261	3592.8973
0.1547	70.7514	75.1889	118.5552	69.9797	109.6773	60.0122	-8.1891	75.3362	403.3149	3594.1271
0.1548	70.7751	75.1455	118.5931	69.987	109.7588	59.3755	-8.1126	76.0269	403.0616	3594.1556
0.155	70.7632	75.1981	118.6036	70.0194	109.8026	61.8275	-8.209	76.2128	402.4145	3592.5018
0.1551	70.7279	75.2003	118.6149	70.0093	109.851	62.1846	-8.1564	76.9286	400.7747	3593.5144
0.1552	70.7424	75.1969	118.6025	69.9939	109.8615	61.5947	-7.8051	76.28	402.388	3592.9081
0.1553	70.7555	75.2023	118.8826	69.9124	110.0217	61.8223	-8.1896	78.3034	400.4813	3592.5045
0.1553	70.7414	75.2082	118.9093	69.9408	110.0758	61.9795	-8.086	79.366	401.5459	3591.8808
0.1554	70.7642	75.1983	118.8824	69.9505	110.0967	62.9092	-8.2525	77.8119	400.9187	3594.8529
0.1555	70.7596	75.1962	118.8789	69.9393	110.1684	63.6291	-8.4506	79.7632	399.5953	3595.1495
0.1556	70.7631	75.2074	118.8551	69.9303	110.1822	64.6203	-8.1781	80.1771	400.6142	3594.2598
0.1557	70.7612	75.1816	118.9138	69.9406	110.2098	63.171	-8.0893	80.331	400.3383	3592.2564
0.1558	70.769	75.2089	118.839	69.935	110.2523	65.2369	-8.1188	80.8047	397.78	3593.2991
0.1559	70.7624	75.1939	118.8739	69.9316	110.2662	67.0718	-8.2992	82.5681	397.1644	3594.2678
0.156	70.7671	75.2216	118.9297	69.9103	110.3385	69.6361	-8.2568	84.3042	396.3182	3596.749
0.1561	70.7611	75.1927	118.8576	69.9482	110.3578	69.0272	-8.0099	85.6909	394.2795	3593.1057
0.1562	70.7651	75.1977	118.9105	69.9445	110.396	71.5279	-8.3032	87.3867	395.921	3594.4874
0.1562	70.7455	75.2434	118.8559	69.972	110.4137	72.508	-8.0467	89.5269	394.0414	3592.0236
0.1563	70.7649	75.234	118.8615	69.9898	110.4236	75.5574	-8.3697	91.2574	394.3002	3591.9651
0.1564	70.7629	75.225	118.8834	70.0001	110.4889	75.3487	-7.9375	91.5965	391.4666	3590.8535
0.1565	70.7647	75.2549	118.8399	70.0324	110.4654	79.0774	-8.2459	94.2942	391.7546	3592.8091

0.1565	70.7637	75.2206	118.8987	69.9618	110.5425	79.3551	-7.8722	97.387	390.9158	3593.2837
0.1566	70.7626	75.2248	118.9196	69.9707	110.5654	81.475	-8.3727	96.822	390.1155	3593.0335
0.1567	70.7622	75.2191	118.9961	69.9562	110.6282	82.7361	-7.774	98.861	388.4953	3592.5631
0.1567	70.7739	75.2309	119.0111	69.9977	110.6747	83.9033	-8.0665	101.4083	388.0557	3593.9553
0.1568	70.7695	75.2087	118.9199	69.9633	110.651	84.6762	-7.6089	102.6759	388.6758	3591.9435
0.1569	70.7536	75.2179	119.0102	69.956	110.7622	86.7319	-8.1322	103.9584	386.9964	3592.3638
0.1569	70.77	75.2194	118.9999	69.9582	110.8315	88.6976	-8.14	104.6567	387.2528	3592.0958
0.157	70.7546	75.2311	119.0242	69.9409	110.8794	87.8008	-8.163	104.319	386.1225	3589.4198
0.1571	70.7713	75.2284	118.9834	69.9694	110.8801	90.2536	-8.22	106.5267	387.4244	3592.0557
0.1572	70.7563	75.2328	118.915	69.9931	110.9234	90.2044	-7.9891	107.3767	385.847	3591.8731
0.1574	70.7414	75.2423	118.9545	70.0164	110.9798	91.0503	-8.5048	106.6414	384.8566	3591.0604
0.1574	70.7644	75.2572	118.9869	69.9884	111.0641	89.6953	-7.9559	106.9591	385.1597	3593.2499
0.1575	70.7678	75.2589	118.9647	70.0293	111.0548	91.2946	-8.3637	106.6591	384.2316	3591.6354
0.1576	70.8002	75.2164	118.9325	70.0197	111.0748	92.3623	-8.1507	108.5999	385.5307	3592.1679
0.1578	70.7724	75.2472	119.0924	69.9838	111.215	91.0654	-8.1784	107.7499	384.1464	3592.3523
0.158	70.7512	75.2388	119.0582	69.9769	111.286	91.0627	-7.8594	108.2045	385.1708	3594.0675
0.158	70.7596	75.2472	119.0526	70.0096	111.3281	91.1834	-8.2982	108.356	384.2405	3592.4645
0.1581	70.7953	75.2676	119.0433	69.9464	111.3539	91.6869	-8.1681	107.7795	385.8519	3593.6667
0.1582	70.7556	75.2491	119.0424	69.9523	111.3653	90.0853	-8.1898	109.4552	384.7983	3593.0767
0.1583	70.7805	75.2426	119.036	69.9696	111.3866	91.9972	-8.1792	107.5356	384.163	3593.843
0.1583	70.781	75.2574	119.048	69.9359	111.462	89.8516	-7.9893	108.2957	384.5865	3594.0044
0.1584	70.782	75.2462	119.0809	70.0063	111.5478	91.8091	-8.2338	108.0801	385.8629	3591.4744
0.1585	70.7603	75.248	119.1019	69.9577	111.5805	89.8253	-8.1057	107.7314	384.2405	3591.2782
0.1586	70.7912	75.2763	119.1348	69.9454	111.6211	91.0497	-8.1611	108.101	384.1021	3591.695
0.1587	70.7651	75.2489	119.1336	69.9868	111.7516	91.2431	-8.5219	108.5538	384.8566	3593.0384
0.1587	70.7818	75.2719	119.0704	70.0226	111.7219	92.065	-8.4726	109.3649	382.8894	3594.5083
0.1588	70.7715	75.2576	119.0929	69.9868	111.7588	91.0352	-8.4117	109.1477	384.0621	3589.3968
0.1589	70.7511	75.2694	119.1156	69.9922	111.7823	91.9396	-8.1514	108.2045	384.9161	3593.5625
0.159	70.7762	75.2842	119.1293	69.9985	111.8562	90.5341	-8.1284	108.4927	385.1265	3593.2499
0.1591	70.7851	75.2625	119.1613	69.9878	111.9083	91.1602	-8.4737	108.7514	384.4786	3592.1439
0.1592	70.783	75.252	119.1178	70.0098	111.9276	92.4737	-8.5472	109.5436	384.2899	3592.8851
0.1592	70.7759	75.2669	119.1266	70.009	111.9388	91.0076	-8.0814	107.4014	382.8439	3591.7198
0.1593	70.7312	75.2877	119.1728	70.02	112.0101	92.3585	-8.2512	109.4721	384.8662	3592.6568
0.1594	70.7417	75.2791	119.1281	70.0007	111.9906	90.9765	-8.3236	108.8931	384.6447	3591.8041
0.1595	70.7971	75.2784	119.251	69.9455	112.1186	90.6984	-8.1357	108.9073	384.0092	3591.8808
0.1596	70.7839	75.2652	119.3059	69.9968	112.1977	92.2249	-8.3814	108.6528	383.3206	3591.4361
0.1597	70.7632	75.2689	119.3422	69.9581	112.2916	92.2818	-8.6179	108.8436	383.5431	3592.4404
0.1598	70.757	75.288	119.3588	69.9571	112.3368	91.725	-8.2505	108.9842	384.1132	3592.0878
0.1599	70.7424	75.2847	119.369	69.9611	112.3472	91.9575	-8.1702	108.5538	384.793	3592.9157
0.16	70.7705	75.2835	119.3703	69.955	112.358	91.9282	-8.4289	110.2399	384.417	3592.7777
0.1601	70.7717	75.2847	119.3437	69.9816	112.3985	92.9544	-8.6836	109.3527	383.3683	3591.9881
0.1601	70.766	75.2612	119.3902	69.9918	112.3959	91.856	-8.2324	109.5645	382.8396	3591.8954
0.1602	70.7671	75.2971	119.3131	69.9992	112.4589	93.0229	-8.627	109.7344	383.988	3591.9268
0.1603	70.8053	75.275	119.3265	69.96	112.4173	92.7078	-8.2374	109.8638	384.3956	3592.0156
0.1603	70.7688	75.2891	119.3255	69.9851	112.4498	92.7092	-8.7015	109.9854	384.7666	3592.3408
0.1605	70.7606	75.2839	119.2793	70.0164	112.4225	94.0789	-8.7055	110.0707	384.019	3591.5668
0.1605	70.7676	75.2903	119.2581	70.053	112.4325	92.4373	-8.4699	109.0593	383.1617	3594.0351
0.1607	70.7619	75.2798	119.2579	70.0112	112.4707	92.4977	-8.2739	111.3322	383.8132	3593.2761
0.1607	70.762	75.2969	119.2634	70.0413	112.4475	93.3427	-8.4261	111.1025	384.4488	3594.9857
0.1609	70.77	75.2832	119.2265	70.0749	112.4323	94.1681	-8.7556	110.104	383.1165	3594.6526
0.161	70.755	75.3114	119.2845	70.0065	112.4804	92.8054	-8.3855	111.4714	384.235	3595.6304
0.161	70.7514	75.3132	119.2495	70.0173	112.4359	93.6404	-8.4421	110.3531	383.5801	3592.2871
0.1611	70.7596	75.2931	119.3043	70.019	112.4701	94.9884	-8.5228	110.2703	383.1608	3593.6186

0.1612	70.7851	75.3054	119.2749	70.0188	112.4374	93.5658	-8.5709	110.7207	385.4021	3592.6014
0.1612	70.7683	75.3154	119.2727	70.0777	112.4352	94.9199	-8.3776	110.3566	384.6288	3589.6958
0.1613	70.7729	75.3274	119.2822	70.0606	112.4591	93.0291	-8.2623	111.2014	382.452	3595.622
0.1615	70.7823	75.3285	119.3125	70.0351	112.4483	93.0302	-8.4124	111.2386	384.6613	3591.5267
0.1615	70.7683	75.2911	119.2873	70.0608	112.4354	95.2105	-8.4734	111.0636	384.3534	3596.1357
0.1616	70.7693	75.3079	119.3315	70.0392	112.4899	93.6962	-8.1119	111.9112	383.8363	3592.4965
0.1617	70.7578	75.2903	119.31	70.0547	112.4726	94.4632	-8.3018	111.4347	384.0727	3591.6814
0.1619	70.7414	75.3081	119.3614	70.051	112.4833	95.0825	-8.2725	112.8275	382.9816	3590.8228
0.1619	70.7767	75.3382	119.3913	70.0645	112.5072	94.2369	-8.563	112.022	383.5428	3590.4206
0.162	70.7544	75.3137	119.4326	70.0432	112.5332	95.2833	-8.148	111.5408	383.453	3591.3594
0.1621	70.77	75.3265	119.4017	70.0547	112.5603	93.751	-8.315	112.2585	383.6646	3593.274
0.1622	70.7649	75.3071	119.3578	70.0645	112.5781	95.3482	-8.7017	112.0109	383.4901	3592.3484
0.1622	70.7764	75.3023	119.4119	70.0575	112.593	94.9159	-8.3317	113.6333	382.9005	3593.1698
0.1623	70.7601	75.3318	119.4043	70.0803	112.6079	95.9563	-8.7593	112.0664	384.307	3593.2499
0.1624	70.7987	75.3066	119.393	70.0842	112.727	95.817	-8.5983	113.5261	383.5041	3589.3386
0.1625	70.77	75.3269	119.4023	70.0513	112.7688	96.2465	-8.3772	112.7179	383.1246	3593.7284
0.1626	70.7611	75.3125	119.4505	70.0381	112.8171	95.0776	-8.2253	113.26	382.7731	3591.2622
0.1626	70.7767	75.3025	119.4388	70.0619	112.863	96.5611	-8.552	113.7109	382.8728	3590.6611
0.1627	70.7815	75.3481	119.4474	70.0877	112.9075	94.9306	-8.5402	113.4108	384.3693	3590.4931
0.1628	70.7563	75.3153	119.4478	70.0586	112.9474	96.143	-8.9581	113.5631	383.565	3592.8893
0.1628	70.7492	75.333	119.5285	70.0972	113.0151	95.9533	-8.1257	111.4312	383.6119	3592.9847
0.1629	70.7744	75.3104	119.4637	70.09	113.0383	96.8453	-8.5294	113.2674	384.1187	3591.9756
0.1631	70.7637	75.315	119.4697	70.0706	113.1019	96.7181	-8.6812	113.2268	383.0112	3589.8756
0.1631	70.7563	75.3331	119.5699	70.0581	113.1773	97.176	-8.6093	114.8861	384.1962	3590.2363
0.1632	70.7417	75.3474	119.568	70.0692	113.2224	96.5389	-8.688	113.4355	383.1458	3591.1831
0.1633	70.7593	75.3162	119.5486	70.0713	113.2102	96.8099	-8.9979	113.4744	382.1713	3592.0648
0.1634	70.7571	75.3286	119.6162	70.0452	113.2444	98.1409	-8.8365	114.3829	383.6596	3592.2181
0.1635	70.7593	75.3336	119.5777	70.0941	113.2602	97.4844	-8.9918	113.2896	383.1774	3591.8393
0.1636	70.7626	75.3344	119.5779	70.0714	113.2229	97.6953	-9.1463	114.2394	383.0445	3591.663
0.1636	70.739	75.3203	119.5569	70.0383	113.2377	97.5056	-8.8453	115.1853	383.5272	3592.6091
0.1638	70.7481	75.3377	119.5834	70.0489	113.251	97.9164	-8.6687	115.5033	384.6558	3592.9774
0.1639	70.7591	75.3232	119.6034	70.0565	113.286	97.4891	-8.978	114.5313	383.2327	3590.2283
0.164	70.7563	75.3401	119.664	70.0574	113.2899	97.5331	-9.0114	114.8459	382.6903	3593.7514
0.1642	70.761	75.3423	119.6676	70.0317	113.3343	96.6126	-8.8196	115.1924	382.4361	3594.1807
0.1642	70.7263	75.354	119.6437	70.0904	113.3127	98.2689	-9.1921	115.4398	382.5632	3594.8554
0.1643	70.7667	75.3487	119.6739	70.0621	113.3341	97.6749	-8.2569	115.8654	383.6314	3594.4281
0.1644	70.7426	75.3483	119.6373	70.0838	113.3613	98.4164	-9.9541	114.7116	382.1713	3590.3091
0.1644	70.7417	75.3441	119.7069	70.0601	113.3998	99.3433	-9.6875	115.1337	381.6214	3594.4522
0.1645	70.7449	75.3798	119.6867	70.0586	113.3894	99.0446	-10.061	115.6802	381.9541	3592.2258
0.1646	70.7491	75.3668	119.8918	70.0064	113.5099	98.9475	-9.6675	114.7531	381.5162	3593.0736
0.1647	70.7422	75.343	119.9303	69.9484	113.5377	97.869	-9.6772	115.6272	382.8227	3593.1994
0.1647	70.7494	75.3543	119.894	70.0113	113.5623	98.8333	-9.0967	117.6467	382.8673	3591.8393
0.1648	70.72	75.3555	119.9425	70.0072	113.5808	98.3502	-9.1469	116.9593	383.4376	3593.8992
0.1649	70.7542	75.3515	119.8798	70.053	113.5555	98.7655	-8.8912	116.405	382.8174	3594.0835
0.165	70.7451	75.3605	119.7881	70.0841	113.5916	99.9927	-8.8075	116.7725	381.4086	3590.5238
0.1651	70.7461	75.3331	119.8953	70.0023	113.6862	98.7144	-7.5358	116.4863	383.2604	3590.621
0.1651	70.7422	75.3624	119.7688	70.0877	113.6121	100.6057	-7.7853	116.9556	381.7986	3591.0859
0.1652	70.732	75.3446	119.8285	70.0772	113.7696	100.4208	-6.9772	116.0022	382.2028	3592.7049
0.1653	70.7343	75.3474	119.9833	70.0148	113.792	98.6927	-7.0391	116.221	382.6797	3592.3638
0.1654	70.7369	75.3622	119.9133	70.0131	113.857	100.5016	-7.2072	117.5506	383.194	3589.5711
0.1655	70.7368	75.3864	119.9289	70.0569	113.8955	100.1855	-6.7225	115.698	382.6162	3591.6278
0.1656	70.7384	75.3713	119.9222	70.0504	113.9361	100.3995	-7.4715	117.1589	382.8728	3591.9355
0.1656	70.7121	75.3629	119.9121	70.0579	113.9685	99.7009	-7.2602	116.7967	382.8451	3591.8233

0.1657	70.7578	75.3831	119.9503	70.0305	114.0894	99.8375	-7.2929	117.1109	382.4963	3592.7209
0.1658	70.7385	75.3588	119.9467	70.0899	114.0931	101.409	-7.6592	118.0486	381.4721	3592.1414
0.166	70.7491	75.3566	119.8621	70.1217	114.1312	101.6591	-7.9044	118.6371	382.5406	3592.0557
0.1661	70.7496	75.3647	119.915	70.1068	114.1817	101.6285	-8.0127	117.4693	382.906	3594.4923
0.1662	70.7436	75.4005	119.9738	70.0882	114.2303	100.3401	-7.5625	116.6063	382.0442	3594.9167
0.1662	70.7358	75.3732	120.012	70.054	114.2639	99.974	-7.9946	117.6951	382.1077	3591.8961
0.1663	70.7441	75.3864	119.963	70.0869	114.3057	101.8293	-8.0142	118.1193	383.792	3593.8587
0.1664	70.7348	75.378	119.9633	70.0616	114.3127	100.7125	-7.7276	118.0163	382.3468	3592.8973
0.1665	70.7529	75.391	119.9908	70.0924	114.3854	100.8063	-7.4531	118.445	381.5162	3593.6908
0.1666	70.7375	75.3847	119.9319	70.0992	114.3728	101.7689	-7.8441	119.049	382.1872	3592.5171
0.1667	70.7356	75.3949	119.984	70.0816	114.4561	100.9141	-7.5333	118.752	384.4541	3593.8127
0.1667	70.7334	75.3635	119.9152	70.1163	114.4662	101.6347	-8.1577	119.6039	382.0971	3593.0154
0.1668	70.7547	75.3775	119.939	70.1186	114.5213	100.6624	-7.8791	119.2876	383.3767	3592.1679
0.1669	70.7356	75.3889	119.9495	70.1089	114.5418	102.6949	-8.2065	118.2824	382.6679	3594.6205
0.1669	70.7371	75.3879	119.9525	70.112	114.5874	101.9424	-7.9178	119.465	381.9315	3591.5748
0.1672	70.7444	75.3988	119.9847	70.1165	114.725	101.521	-7.901	118.8651	381.684	3592.1874
0.1673	70.7305	75.394	120.0579	70.1252	114.8432	102.9541	-8.0656	119.1656	382.4188	3596.9529
0.1674	70.7561	75.3764	120	70.1199	114.9007	101.9484	-8.1927	119.9362	381.3609	3593.9201
0.1675	70.7673	75.39	120.0301	70.1458	114.9261	103.1213	-7.967	119.6075	382.6162	3590.0255
0.1676	70.7514	75.392	120.0854	70.1125	115.0209	103.046	-7.7144	119.7089	383.2106	3593.8335
0.1677	70.7463	75.4056	119.9959	70.15	114.9996	101.7813	-7.7995	120.6538	382.5261	3593.2377
0.1678	70.744	75.4075	120.0164	70.1671	115.0769	103.53	-8.0331	119.7939	380.6745	3592.9935
0.1678	70.7422	75.3795	120.0426	70.1415	115.0775	102.2665	-7.9914	119.968	381.8217	3594.0351
0.1679	70.7629	75.4052	119.9932	70.1422	115.1069	103.8783	-8.3094	121.0497	381.8482	3594.0734
0.168	70.7651	75.4	120.0402	70.117	115.1613	102.1554	-7.8474	119.9433	381.7581	3591.1524
0.1681	70.7895	75.4045	120.1049	70.158	115.2231	104.1561	-8.326	119.4465	381.7321	3593.5625
0.1681	70.7788	75.4167	120.0102	70.1353	115.2159	103.1036	-7.9544	120.1819	381.9149	3592.6408
0.1682	70.7773	75.4147	120.0957	70.1493	115.3341	102.1003	-7.8829	121.4739	382.3249	3592.1261
0.1683	70.7475	75.419	120.0536	70.1552	115.3399	104.0045	-8.1297	120.6715	381.6628	3591.2138
0.1684	70.7673	75.4002	120.0669	70.1779	115.4303	103.6034	-8.378	120.3667	380.7354	3590.8134
0.1685	70.7835	75.4037	120.0821	70.1623	115.4737	103.5744	-7.9694	120.9932	382.5049	3593.6134
0.1686	70.7501	75.3958	120.0967	70.1803	115.5377	103.3721	-8.1687	121.0725	381.5992	3594.3239
0.1687	70.7739	75.4064	120.1217	70.154	115.5565	103.482	-7.6727	120.3675	378.9192	3593.0997
0.1687	70.7622	75.402	120.1257	70.1581	115.6251	104.2995	-8.219	120.4099	381.8058	3592.6704
0.1688	70.7397	75.4356	120.1274	70.1793	115.6627	105.0921	-8.0955	121.2866	382.9816	3595.1927
0.169	70.7803	75.4182	120.1429	70.138	115.7141	103.5068	-7.8934	121.2499	381.7709	3592.6168
0.1691	70.7703	75.4109	120.1174	70.1401	115.7862	103.4092	-7.9551	121.978	381.2006	3592.6007
0.1692	70.7722	75.4388	120.2295	70.1713	115.8917	104.1378	-8.2772	121.0108	381.7793	3593.6594
0.1692	70.7461	75.4176	120.1654	70.1522	115.8755	105.3977	-8.0577	120.4028	381.6151	3595.1314
0.1694	70.7852	75.4273	120.1729	70.1647	115.9835	105.3889	-7.9529	121.0603	381.9064	3592.0571
0.1694	70.7708	75.4394	120.2745	70.15	116.0736	104.0734	-7.8789	121.7193	382.3412	3592.192
0.1695	70.7887	75.4445	120.2091	70.1572	116.0406	104.6048	-8.0875	122.6506	380.3368	3591.9194
0.1696	70.7852	75.4347	120.2593	70.1822	116.125	103.889	-8.1723	122.499	382.1342	3594.3264
0.1697	70.7913	75.4286	120.2362	70.205	116.1569	105.8322	-8.3326	121.4421	382.0812	3593.5521
0.1698	70.7895	75.407	120.2423	70.1784	116.1714	105.5857	-7.9993	121.7304	382.0921	3592.2481
0.1699	70.7637	75.4578	120.2523	70.1759	116.214	103.7214	-8.0641	121.2536	381.1729	3592.3603
0.17	70.7568	75.4407	120.3475	70.1147	116.3318	105.1956	-7.948	121.0799	381.0677	3592.0477
0.1701	70.7504	75.4292	120.3275	70.1863	116.3518	104.5732	-8.3151	122.026	381.6823	3590.2603
0.1702	70.7544	75.4503	120.2749	70.2275	116.344	106.1032	-8.438	121.5481	381.4774	3594.0427
0.1703	70.7542	75.4356	120.3163	70.1493	116.4531	104.0818	-8.113	122.2477	381.5494	3591.687
0.1703	70.7313	75.4458	120.318	70.1843	116.4399	105.8839	-7.9862	122.1886	382.8507	3593.3381
0.1704	70.7463	75.4373	120.3449	70.1818	116.5242	104.056	-7.8434	121.5057	382.2878	3591.7121
0.1705	70.7551	75.4266	120.3253	70.1838	116.5668	106.1326	-8.2507	122.3682	381.2391	3591.7734

0.1706	70.7392	75.446	120.3735	70.1541	116.6054	104.3512	-8.1542	122.4695	383.4653	3592.8412
0.1706	70.7609	75.4855	120.3725	70.2017	116.6845	105.5867	-8.3467	123.0423	381.6159	3592.4484
0.1707	70.7338	75.433	120.3602	70.1789	116.6947	105.739	-8.0079	122.8058	381.7598	3588.2406
0.1709	70.7525	75.4695	120.3805	70.1945	116.7875	105.387	-7.846	123.1495	381.4664	3594.4682
0.171	70.7349	75.4649	120.4321	70.1977	116.8986	105.9415	-8.276	122.7818	382.9181	3593.6364
0.1711	70.7415	75.4662	120.4159	70.1822	116.9256	106.4933	-7.9829	122.4953	381.3113	3593.0816
0.1712	70.7361	75.4736	120.4204	70.2073	116.8976	106.2481	-8.3412	122.7393	382.2969	3591.8874
0.1714	70.7256	75.4555	120.4439	70.193	117.0336	106.1283	-7.964	121.1908	382.0035	3591.4786
0.1715	70.7427	75.4394	120.4803	70.1919	117.1126	105.412	-8.2143	123.0792	3592.1439	
0.1715	70.7167	75.4542	120.4664	70.1776	117.0886	105.9583	-8.4375	123.5855	380.1208	3591.5267
0.1716	70.7209	75.4754	120.4723	70.1874	117.1087	104.9108	-7.9592	123.6797	381.1226	3593.1917
0.1717	70.7358	75.4512	120.5052	70.2064	117.1608	106.2996	-8.1584	124.1074	381.4139	3590.3628
0.1718	70.7519	75.4792	120.4934	70.2002	117.1932	107.1724	-8.3377	123.2603	381.2615	3592.9133
0.1719	70.7349	75.4819	120.5107	70.212	117.2738	106.9332	-8.1728	122.8384	381.541	3595.254
0.172	70.7402	75.4623	120.4961	70.2234	117.2659	105.9545	-7.8423	123.7223	382.4188	3595.422
0.1721	70.7529	75.4683	120.5466	70.2048	117.3146	106.6568	-8.467	123.7893	381.0166	3594.5794
0.1722	70.7598	75.4751	120.4488	70.2172	117.31	107.0842	-8.1417	124.4645	380.6777	3593.6364
0.1722	70.7376	75.4674	120.5593	70.2139	117.3842	106.4199	-8.3447	123.1199	382.0201	3595.6785
0.1723	70.7522	75.4386	120.5111	70.2183	117.3835	107.0739	-8.0737	123.0016	379.2736	3593.0415
0.1724	70.7489	75.4608	120.5211	70.1978	117.4185	105.9304	-7.9241	122.7466	384.534	3593.1778
0.1724	70.7502	75.4729	120.5439	70.2119	117.4387	107.5018	-8.2747	123.5418	381.1808	3593.2377
0.1725	70.7576	75.4644	120.5026	70.2275	117.445	107.19	-8.1891	124.454	382.0754	3591.7271
0.1726	70.7453	75.4598	120.5413	70.193	117.5387	105.556	-8.1374	124.1473	381.0511	3592.224
0.1727	70.7399	75.4595	120.5573	70.2068	117.5347	107.2969	-8.4875	122.6062	381.7155	3593.7629
0.1728	70.7652	75.4669	120.5679	70.2278	117.5728	107.1306	-8.197	123.8701	380.9182	3592.6729
0.1728	70.7541	75.4719	120.5972	70.2444	117.5757	107.8484	-8.2239	124.7861	382.2825	3590.9071
0.173	70.7491	75.4432	120.6088	70.2237	117.5863	107.5049	-8.3659	123.4192	382.1419	3592.5446
0.1731	70.7351	75.4751	120.5989	70.2135	117.6313	106.6875	-8.0378	124.3579	381.4996	3589.523
0.1731	70.7742	75.4886	120.6295	70.2295	117.6445	106.1561	-8.0303	124.1547	380.3866	3593.1778
0.1732	70.7665	75.4886	120.5918	70.2241	117.6292	108.2695	-8.242	124.0844	382.1585	3591.8553
0.1733	70.7705	75.5005	120.6058	70.236	117.6561	107.0469	-8.4022	123.8317	379.9785	3591.4361
0.1733	70.7766	75.4968	120.6266	70.2206	117.6984	107.5063	-8.3783	124.719	381.6098	3589.3125
0.1734	70.76	75.5022	120.6514	70.2094	117.685	106.4978	-8.0401	123.5418	382.023	3594.0734
0.1735	70.7662	75.4832	120.7003	70.2073	117.7203	108.7274	-8.2297	124.5205	380.968	3596.488
0.1735	70.7642	75.4965	120.6705	70.1999	117.748	105.9285	-7.9193	125.0601	382.2028	3593.7308
0.1736	70.7754	75.4924	120.6625	70.2249	117.7725	107.8124	-8.4552	124.2249	380.3534	3591.9034
0.1737	70.756	75.4909	120.6797	70.2067	117.7522	106.4478	-8.1847	125.4075	381.2892	3591.4385
0.1738	70.7706	75.4901	120.7499	70.2198	117.85	106.6847	-8.158	124.3875	380.4198	3594.1957
0.1739	70.7619	75.4891	120.6615	70.2264	117.7915	107.713	-8.611	125.6218	381.5217	3594.5564
0.174	70.7693	75.4965	120.7292	70.2497	117.8617	107.3712	-8.2764	125.0416	380.7299	3594.5484
0.174	70.7637	75.5036	120.7564	70.229	117.8865	106.6113	-8.1367	124.7053	381.4719	3590.5409
0.1741	70.8011	75.5163	120.7152	70.2502	117.8613	108.6916	-8.4639	124.27	380.5929	3592.3791
0.1742	70.7782	75.5054	120.7827	70.2328	117.9802	108.1719	-8.1689	126.7933	380.7133	3591.7111
0.1743	70.765	75.5024	120.7664	70.1984	117.9165	106.7042	-8.1753	125.5479	381.2836	3594.4121
0.1744	70.7678	75.51	120.7836	70.2321	117.9536	107.7151	-8.451	124.1852	380.7359	3593.2914
0.1745	70.8025	75.5067	120.7469	70.2576	117.967	108.8157	-8.5467	124.7349	380.7853	3593.9472
0.1746	70.7971	75.4835	120.7574	70.23	118.0375	107.8626	-8.4807	125.5479	381.5937	3593.0656
0.1747	70.7655	75.4672	120.8291	70.2216	118.0692	108.2769	-8.3436	124.1288	380.8628	3592.4805
0.1748	70.7701	75.5176	120.8856	70.2027	118.1607	106.5388	-8.4282	125.9581	381.195	3591.8794
0.1749	70.7767	75.5294	120.868	70.2256	118.1507	109.0786	-8.7369	124.5427	381.9924	3594.6526
0.1749	70.7798	75.5122	120.9152	70.1566	118.2407	107.724	-8.3108	125.0512	382.2136	3592.8314
0.175	70.7854	75.4934	120.8852	70.2358	118.2561	109.1003	-8.3398	124.8639	382.9551	3592.5631
0.1751	70.7881	75.5229	120.9078	70.2126	118.3409	107.8537	-7.8945	125.1432	381.541	3592.8697

0.1751	70.7713	75.5189	120.8798	70.2351	118.335	109.5495	-8.375	126.0579	382.3578	3592.1198
0.1752	70.7739	75.5291	120.9093	70.2218	118.3919	107.8022	-8.1959	125.2523	380.5804	3592.8732
0.1753	70.7642	75.5169	120.8332	70.2488	118.3933	108.3549	-8.4984	125.8362	380.3568	3591.2462
0.1753	70.7732	75.4958	120.8966	70.2353	118.4277	107.3215	-8.1596	125.8077	381.2444	3591.1141
0.1755	70.8012	75.4901	120.898	70.2257	118.4582	107.3312	-8.2196	125.7881	381.9038	3592.8652
0.1756	70.7954	75.5276	120.93	70.1945	118.5152	108.8454	-8.3765	124.6905	381.0012	3592.4404
0.1757	70.8062	75.5336	120.9346	70.2277	118.59	108.6507	-8.547	125.9809	381.7317	3589.9335
0.1757	70.7952	75.5251	121.0052	70.2242	118.687	108.4499	-8.2181	126.3556	380.8366	3591.2291
0.1759	70.8017	75.5263	120.9887	70.2418	118.7588	107.7715	-8.1181	124.8901	379.7443	3593.0896
0.1759	70.7846	75.5373	121.0012	70.2367	118.8638	107.7623	-8.7168	126.1281	380.8849	3594.9571
0.176	70.7956	75.5227	120.9947	70.2351	118.9298	108.5528	-8.736	127.1814	381.2504	3593.795
0.1761	70.7816	75.5291	120.9997	70.2275	118.9773	108.419	-8.3168	125.0157	381.1009	3592.4965
0.1762	70.7764	75.5185	120.9795	70.2566	118.9529	109.3234	-8.6349	124.9558	380.3758	3591.2674
0.1763	70.7754	75.5357	120.9565	70.2778	119.0364	108.995	-8.4717	125.7918	381.8373	3593.4343
0.1764	70.7545	75.548	120.946	70.2569	119.091	108.7256	-8.124	125.4149	381.3888	3593.6747
0.1765	70.729	75.5352	120.995	70.2482	119.135	108.2221	-8.3684	126.1651	380.7354	3593.1457
0.1766	70.7607	75.5322	121.018	70.2324	119.1921	108.3078	-8.3168	127.4515	381.5622	3596.0054
0.1767	70.7468	75.5256	121.0184	70.2622	119.25	109.9729	-8.5758	125.2386	381.112	3591.0528
0.1768	70.7721	75.5452	121.0144	70.2808	119.3093	109.2811	-8.7078	125.7881	380.37	3593.7148
0.1769	70.7471	75.5431	121.0299	70.2583	119.3222	108.1794	-8.2841	126.8894	381.6048	3593.0175
0.1769	70.7371	75.5383	121.0894	70.2374	119.4068	107.909	-8.6694	126.1096	382.1197	3593.6827
0.177	70.7586	75.5623	121.0362	70.2878	119.416	108.2908	-8.0869	125.8657	380.5029	3593.6026
0.1771	70.7466	75.54	121.0524	70.2431	119.4584	109.0764	-8.6409	126.8081	379.8143	3593.8817
0.1772	70.7622	75.5531	121.0528	70.2753	119.4803	109.7392	-8.5099	126.8258	380.9796	3592.6168
0.1773	70.7624	75.5126	121.0826	70.2791	119.5624	110.3429	-8.3311	125.3816	381.7321	3595.3819
0.1774	70.7488	75.5349	121.0471	70.2475	119.563	108.1914	-8.1782	125.4613	382.9604	3593.5521
0.1774	70.7691	75.5307	121.0939	70.2368	119.6194	110.4314	-8.504	125.4966	381.059	3593.0691
0.1775	70.7436	75.5517	121.0903	70.2697	119.6039	108.5876	-8.1086	125.2881	381.5675	3594.449
0.1776	70.7434	75.5392	121.081	70.3067	119.6591	109.398	-8.6114	127.0379	381.2497	3593.6671
0.1776	70.7468	75.5505	121.1113	70.265	119.6985	108.2676	-8.145	126.3609	380.9459	3594.9732
0.1778	70.7706	75.5538	121.1208	70.2594	119.743	109.8096	-8.26	127.0705	381.5328	3593.4343
0.178	70.7324	75.5526	121.1663	70.2497	119.8782	107.8981	-8.1475	125.7794	381.0961	3589.3738
0.1781	70.7392	75.5607	121.1111	70.2878	119.8557	110.1924	-8.3273	127.0594	380.6081	3593.6908
0.1781	70.7412	75.5755	121.1845	70.2581	119.8841	108.8872	-8.0163	126.1651	380.9901	3588.8898
0.1782	70.7356	75.5509	121.1362	70.2752	119.9126	110.2013	-8.6711	125.6981	381.3132	3592.6934
0.1783	70.7407	75.5439	121.1792	70.2604	119.9389	108.8782	-8.3514	127.3631	381.1437	3593.7514
0.1784	70.7425	75.5717	121.1788	70.2573	120.0308	110.3837	-8.5934	126.1429	381.3944	3591.695
0.1785	70.7549	75.558	121.1694	70.3066	120.0581	110.1684	-8.3902	126.345	380.8736	3592.4558
0.1786	70.7859	75.5691	121.1885	70.3056	120.0829	111.2189	-8.4787	126.749	379.999	3590.9096
0.1788	70.7698	75.5684	121.1687	70.3238	120.1231	110.0577	-8.5823	126.5088	380.8185	3592.2721
0.179	70.7805	75.5689	121.2529	70.3179	120.1848	110.8501	-8.6795	126.627	380.6302	3592.1198
0.179	70.7655	75.5717	121.2072	70.3095	120.2241	110.2546	-8.2751	127.3033	381.1729	3593.29
0.1791	70.7735	75.5668	121.2418	70.3049	120.2332	110.9716	-8.5755	125.8289	380.2328	3590.8535
0.1792	70.7776	75.5612	121.2562	70.283	120.2595	109.7383	-8.1403	127.25	380.3175	3591.3518
0.1792	70.7713	75.6182	121.2473	70.2739	120.3247	109.5446	-8.6275	127.5681	381.2338	3591.1908
0.1793	70.7752	75.5661	121.2592	70.2911	120.296	109.2356	-8.1033	127.8207	380.9403	3591.9275
0.1794	70.7661	75.5985	121.2626	70.2749	120.3639	111.0401	-8.6534	127.2959	381.2126	3591.7964
0.1794	70.7742	75.5778	121.2542	70.3294	120.376	110.9318	-8.3699	127.7763	380.8573	3593.6587
0.1795	70.7713	75.5877	121.2712	70.3289	120.3854	110.6726	-8.6818	128.497	380.5416	3592.6969
0.1796	70.7686	75.5692	121.247	70.3445	120.4176	110.9281	-8.4166	126.9389	380.6988	3593.4217
0.1797	70.791	75.5551	121.2671	70.3211	120.4449	110.6633	-8.2776	128.4412	379.6131	3593.0231
0.1798	70.7831	75.5867	121.3276	70.3253	120.4943	110.5287	-8.5961	126.8709	381.6435	3591.4947
0.1799	70.7744	75.5704	121.3104	70.3281	120.5145	110.8742	-8.6994	126.7416	380.2205	3591.4385

0.1799	70.7886	75.5892	121.3467	70.3145	120.5269	109.3065	-8.4347	127.4621	380.5664	3592.6474
0.1801	70.7867	75.575	121.3623	70.3174	120.599	111.2412	-8.6044	127.7874	380.5472	3594.4281
0.1802	70.7498	75.5919	121.382	70.3408	120.6457	111.8389	-8.4982	128.2539	380.683	3592.5324
0.1803	70.7803	75.6119	121.3983	70.3082	120.7048	109.5133	-8.1121	127.3403	380.0987	3592.0878
0.1804	70.7669	75.6041	121.3879	70.3029	120.7233	110.8286	-8.4852	127.9994	380.0156	3593.9047
0.1805	70.7808	75.5985	121.6051	70.249	120.8187	111.5785	-8.4985	127.6247	379.3747	3592.9617
0.1806	70.7445	75.6094	121.5961	70.273	120.8552	110.655	-8.3967	127.5029	381.4331	3594.7327
0.1806	70.7854	75.6069	121.638	70.1983	120.8671	110.0958	-8.2668	128.0498	380.669	3590.8054
0.1807	70.7764	75.5916	121.6655	70.2204	120.9269	109.4531	-8.1925	128.4554	380.6512	3593.2147
0.1808	70.7615	75.6036	121.7011	70.2103	120.9649	109.2203	-8.3138	128.116	380.1003	3593.3527
0.1809	70.7573	75.5967	121.7139	70.2224	121.0055	109.5124	-8.3122	129.192	382.225	3591.4866
0.181	70.7662	75.6005	121.6767	70.2865	121.0082	111.0739	-8.7863	129.4394	380.9846	3592.5206
0.1811	70.7897	75.6086	121.6428	70.2466	120.9817	111.962	-8.4337	127.8687	381.2504	3594.7327
0.1813	70.7739	75.6063	121.7491	70.2448	121.0224	110.3194	-8.5337	128.9821	380.8683	3592.7931
0.1814	70.7525	75.6097	121.6802	70.262	121.0142	110.5036	-8.2097	128.5303	379.7387	3593.827
0.1815	70.7777	75.5839	121.7267	70.2482	120.9907	109.9239	-8.3721	128.3639	381.3335	3594.3159
0.1815	70.7761	75.6158	121.7016	70.3013	121.0179	111.2018	-8.6412	128.5155	380.005	3593.9047
0.1816	70.8069	75.6099	121.6589	70.2966	121.0181	110.594	-8.3212	128.0559	380.4923	3593.9661
0.1817	70.7798	75.6114	121.6629	70.3107	120.962	111.2059	-8.5842	128.7224	380.5195	3590.7012
0.1818	70.7563	75.6109	121.6492	70.2865	120.9483	112.3865	-8.6582	130.2967	381.0787	3593.4263
0.1819	70.7952	75.625	121.6976	70.2947	120.9159	110.1026	-8.1723	128.8866	379.6237	3591.9881
0.1819	70.7726	75.6221	121.7091	70.2838	120.9757	110.9634	-8.6689	128.1496	381.1341	3591.6389
0.182	70.7969	75.6158	121.7056	70.2982	120.9572	110.3169	-8.1896	128.12	381.5937	3595.5663
0.1821	70.7935	75.638	121.6612	70.3211	120.9417	111.5154	-8.6428	128.4236	381.1226	3593.6057
0.1822	70.7941	75.613	121.6762	70.3294	120.9578	112.8826	-8.4274	128.2198	380.752	3591.126
0.1823	70.7867	75.6285	121.641	70.3445	120.9351	112.4841	-8.4614	128.8555	380.2703	3591.7672
0.1824	70.7881	75.635	121.7096	70.3217	120.959	111.5954	-8.27	128.0665	381.0643	3592.0878
0.1825	70.7647	75.6295	121.6866	70.3349	120.9881	110.9457	-8.5448	128.6005	380.9459	3593.0576
0.1826	70.7942	75.6216	121.6601	70.3786	121.0146	112.3169	-8.7458	128.9856	378.2572	3592.7317
0.1826	70.7941	75.6486	121.7049	70.3358	121.0364	112.0549	-8.5768	129.2472	380.3644	3593.29
0.1827	70.7896	75.6268	121.6629	70.3643	121.0174	112.4511	-8.5841	128.3917	378.469	3595.3307
0.1828	70.7946	75.639	121.6567	70.3606	121.0282	110.8882	-8.1979	128.6559	379.9048	3593.7549
0.1828	70.7915	75.6206	121.6405	70.3542	121.0319	113.0758	-8.5388	128.5524	379.8716	3591.5187
0.1829	70.7815	75.6407	121.5998	70.3682	120.9734	110.1195	-8.4757	128.5473	380.8154	3596.45
0.1831	70.7936	75.6303	121.652	70.3583	121.0185	111.7604	-8.3734	129.7941	379.8273	3593.5465
0.1831	70.7783	75.6328	121.6398	70.379	121.0037	112.2351	-8.3291	128.7963	379.5449	3595.4621
0.1833	70.7664	75.6597	121.6371	70.3966	120.9821	112.7505	-8.431	128.5544	380.7412	3592.4021
0.1834	70.7703	75.6377	121.636	70.3956	120.9375	112.7609	-8.4961	130.973	381.2116	3593.0496
0.1834	70.7698	75.6346	121.7354	70.3465	121.0569	111.2031	-8.3462	128.6226	380.1596	3590.0359
0.1836	70.8099	75.6177	121.9146	70.2944	121.0709	110.8401	-8.1695	131.0359	379.8885	3593.6134
0.1836	70.7581	75.6331	121.9139	70.3427	121.0456	113.1771	-8.7067	128.1053	380.7244	3593.5224
0.1837	70.7879	75.6372	121.8668	70.3408	121.0255	111.71	-8.3347	129.074	381.488	3592.6551
0.1838	70.7757	75.6299	121.8403	70.3626	120.9775	112.6323	-8.5379	129.0705	380.1639	3594.8324
0.184	70.765	75.6604	121.8472	70.3485	120.9489	112.171	-8.8045	129.4837	380.4696	3591.7111
0.184	70.7945	75.6316	121.847	70.3596	120.8886	113.3627	-8.6493	129.6148	380.2433	3591.4668
0.1841	70.7911	75.6526	121.8578	70.3853	120.9161	113.1379	-8.6818	128.4448	380.4022	3592.1951
0.1842	70.7979	75.657	121.858	70.3343	120.9188	112.6163	-8.2067	129.781	379.8302	3593.0767
0.1842	70.7674	75.6558	121.8609	70.3323	120.9264	111.8451	-8.4785	128.9291	380.9266	3592.7931
0.1843	70.779	75.6718	121.95	70.3235	120.9994	112.0586	-8.1586	130.652	379.4896	3591.9034
0.1844	70.7703	75.666	121.9473	70.3401	121.0033	112.6537	-8.5941	128.8407	381.3026	3590.8305
0.1844	70.7775	75.6321	121.8986	70.3347	120.9605	113.7056	-8.4436	129.6389	380.5582	3593.6266
0.1845	70.801	75.6453	121.9149	70.3182	121.0367	112.9216	-8.4232	129.3211	379.4729	3592.3282
0.1847	70.7795	75.6596	121.9488	70.3349	121.0855	111.4121	-8.7468	129.1105	382.0588	3594.0434

0.1847	70.7683	75.6324	121.8939	70.3392	121.0502	112.5355	-8.6824	128.8053	379.9097	3591.8271
0.1848	70.7811	75.6662	121.9189	70.3375	121.0456	112.0698	-8.6935	129.1733	380.1651	3591.4065
0.185	70.7578	75.6731	121.8759	70.4113	121.0609	113.3263	-8.4213	130.1946	379.8567	3592.4098
0.1851	70.7876	75.6638	121.8787	70.3775	121.0661	111.886	-8.3981	130.3066	380.3969	3592.9387
0.1852	70.7505	75.6389	121.8805	70.3695	121.0726	112.2049	-8.6486	128.9573	380.72	3592.0188
0.1853	70.7471	75.6629	121.9019	70.3891	121.0711	112.7247	-8.7523	129.8311	380.1208	3596.0632
0.1854	70.7627	75.6731	121.869	70.4042	121.0444	114.1011	-8.6896	129.9789	379.523	3594.633
0.1855	70.744	75.6904	121.9066	70.4272	121.0858	112.21	-8.5522	129.4542	380.37	3591.9194
0.1856	70.7412	75.6833	121.8632	70.3909	121.0816	113.3165	-8.428	130.7177	380.3493	3594.1961
0.1857	70.753	75.6637	121.8708	70.4161	121.1348	112.8417	-8.3899	129.6685	379.7664	3592.2561
0.1857	70.7512	75.6787	121.9079	70.3951	121.1621	112.9451	-8.7188	129.1129	380.344	3592.4634
0.1858	70.7478	75.6704	121.992	70.3931	121.153	114.1829	-8.5535	130.6824	381.059	3592.9157
0.1859	70.7632	75.6833	121.9339	70.4095	121.138	112.1934	-8.1564	129.9895	379.7878	3594.4337
0.186	70.7877	75.6805	121.9478	70.4106	121.167	113.9806	-8.4871	128.1422	381.1175	3591.6309
0.186	70.7613	75.6594	121.9041	70.4401	121.1153	112.4031	-8.4677	130.4597	380.773	3591.3518
0.1861	70.7632	75.6688	121.9521	70.3818	121.1512	113.0154	-8.7466	129.8126	380.6579	3591.8954
0.1862	70.7593	75.6916	121.9906	70.4015	121.1588	113.8959	-8.5539	129.3957	380.8366	3590.9608
0.1863	70.753	75.6841	122.0182	70.4162	121.2274	112.4088	-8.2304	130.282	380.1596	3591.5668
0.1864	70.7657	75.6882	121.979	70.4141	121.195	113.863	-8.6797	129.3921	379.809	3593.3911
0.1865	70.7525	75.6963	121.9633	70.4341	121.1924	113.5988	-8.5965	130.8252	379.6834	3589.4909
0.1866	70.7354	75.6996	122.0664	70.3813	121.2456	112.8835	-8.3548	129.7424	381.1618	3592.1439
0.1867	70.7655	75.7297	122.0495	70.4124	121.2386	113.7242	-8.5796	129.4542	379.9602	3590.8134
0.1868	70.7681	75.6838	122.1286	70.4091	121.3527	112.4831	-8.7044	130.8991	380.597	3595.43
0.1869	70.7766	75.6894	122.0923	70.3956	121.368	114.0896	-8.4069	130.5021	379.4595	3593.3144
0.1869	70.7806	75.7039	122.0944	70.4099	121.3859	112.237	-8.3752	130.8954	380.3534	3596.5922
0.1871	70.7617	75.7013	122.0793	70.4361	121.4959	112.8412	-8.5839	131.3929	379.9997	3593.1151
0.1872	70.7549	75.6994	122.1599	70.367	121.5955	111.806	-8.7994	130.1875	379.952	3590.9455
0.1873	70.7752	75.6961	122.0824	70.4436	121.6061	113.9546	-9.3352	128.8739	379.6169	3591.5107
0.1874	70.7815	75.7065	122.1928	70.3861	121.7192	113.1122	-8.7233	130.6965	381.0378	3592.6781
0.1875	70.7732	75.7068	122.1183	70.4267	121.7593	113.5096	-8.3315	130.1231	380.9016	3592.6248
0.1876	70.7774	75.7169	122.2337	70.3888	121.8651	112.6004	-8.45	131.0818	379.8461	3593.1381
0.1877	70.7762	75.7084	122.2212	70.3736	121.9864	112.4031	-8.4561	130.7283	381.202	3590.0485
0.1879	70.7935	75.6989	122.2129	70.4237	122.1451	114.1642	-8.5474	131.2904	379.5389	3594.0964
0.188	70.753	75.7145	122.227	70.3722	122.2165	114.3348	-8.3502	129.9224	380.3652	3591.4898
0.1882	70.7992	75.7226	122.1893	70.415	122.2845	115.1325	-8.3157	131.5643	380.1651	3593.843
0.1883	70.8	75.7233	122.2452	70.4339	122.3753	112.1961	-7.8929	130.6663	379.8052	3594.5323
0.1883	70.803	75.7366	122.3203	70.4341	122.4329	113.5589	-8.3548	130.7698	379.0466	3593.3381
0.1885	70.7839	75.7175	122.3325	70.4007	122.55	113.453	-8.4895	131.132	380.3201	3593.1618
0.1885	70.7952	75.7347	122.3072	70.4396	122.5664	114.8964	-8.3338	130.9157	379.6237	3595.7064
0.1886	70.779	75.7355	122.4123	70.3545	122.677	112.7878	-7.9112	130.6183	377.5737	3593.7389
0.1887	70.7852	75.7315	122.5839	70.3488	122.7688	114.0475	-8.3394	131.9524	379.3843	3594.0675
0.1888	70.7839	75.7047	122.6892	70.3595	122.8441	114.9709	-8.4298	130.16	380.4198	3594.1636
0.1889	70.7793	75.7262	122.6689	70.3186	122.8755	113.4694	-8.0723	131.2868	380.1109	3592.9541
0.189	70.8056	75.7468	122.6648	70.3268	122.9245	113.8078	-8.5369	131.7232	380.6468	3590.7332
0.189	70.7681	75.7345	122.636	70.3509	122.9618	114.7844	-8.4468	132.4392	379.5018	3593.6977
0.1891	70.7941	75.7327	122.6316	70.3516	122.9736	113.7261	-8.5627	131.5163	380.7354	3593.5705
0.1892	70.825	75.7279	122.6653	70.335	123.0397	114.89	-8.383	130.2857	379.0687	3594.6125
0.1892	70.783	75.7396	122.6911	70.3193	123.0981	113.121	-8.2305	131.3752	380.3546	3591.2828
0.1893	70.7949	75.7437	122.7117	70.3212	123.1535	114.6216	-8.4416	130.1711	379.5671	3592.9534
0.1895	70.7808	75.7297	122.6877	70.3656	123.2592	112.8231	-8.2935	130.9102	379.927	3591.5027
0.1896	70.8041	75.7427	122.7327	70.3656	123.3116	113.9081	-8.1033	130.4557	379.1961	3592.8412
0.1897	70.7806	75.7372	122.6637	70.3963	123.3546	114.6502	-8.4857	131.2409	380.434	3593.0384
0.1898	70.811	75.7572	122.6541	70.3925	123.7728	115.1297	-8.5614	131.3722	379.855	3592.3523

0.1899	70.8023	75.7307	122.6885	70.5588	123.4346	115.152	-8.3319	132.5141	378.8195	3595.8468
0.19	70.8125	75.7358	122.7539	70.3848	123.4974	114.0373	-8.161	130.8326	378.4486	3593.4343
0.1901	70.7955	75.7618	122.7721	70.3826	123.5273	115.5948	-8.4757	131.909	381.0431	3593.1457
0.1901	70.7977	75.721	122.7783	70.3715	123.5394	113.9174	-8.4465	131.8082	379.5339	3593.3221
0.1902	70.781	75.7279	122.7434	70.3925	123.5775	115.2411	-8.8211	131.3151	379.2211	3593.1457
0.1903	70.7987	75.7348	122.723	70.3685	123.5988	114.328	-8.2925	131.2539	379.8218	3590.5409
0.1903	70.7921	75.7613	122.7042	70.3953	123.6623	114.682	-8.572	131.3389	380.2039	3592.9293
0.1904	70.7945	75.7438	122.7592	70.3915	123.6839	114.3872	-8.4307	131.4388	379.6713	3592.1951
0.1906	70.7854	75.7299	122.7699	70.378	123.8043	114.6271	-8.3296	131.354	377.7699	3590.9991
0.1906	70.7795	75.7564	122.8061	70.3795	123.8389	113.4	-8.3745	131.8341	379.257	3594.9892
0.1908	70.7688	75.7523	122.7771	70.4	123.8568	114.3588	-8.5272	132.1246	380.5717	3591.2444
0.1908	70.7826	75.7493	122.7661	70.4178	123.9511	115.0786	-8.584	131.2133	379.7609	3591.7511
0.1909	70.8135	75.7433	122.7616	70.3719	123.994	114.5116	-8.1255	130.6965	379.9944	3589.2818
0.191	70.7767	75.7511	122.7402	70.3938	124.025	115.4288	-8.7185	130.367	380.0433	3592.9213
0.191	70.7979	75.7496	122.7742	70.397	124.0948	114.3757	-8.3626	131.2303	381.7899	3592.3714
0.1911	70.7913	75.7478	122.7609	70.3971	124.1404	114.3689	-8.5561	131.2909	379.9547	3593.0816
0.1912	70.8089	75.7526	122.8385	70.4025	124.1831	114.0317	-8.2861	132.6324	379.1573	3595.3178
0.1912	70.7825	75.7538	122.825	70.3953	124.3007	113.7288	-8.4827	132.2095	381.488	3592.1721
0.1913	70.7803	75.7674	122.7729	70.4145	124.2995	114.9281	-8.975	131.5385	379.5228	3592.1759
0.1914	70.7894	75.7606	122.7751	70.4176	124.3367	113.624	-8.6824	132.3226	378.1036	3592.1031
0.1915	70.7729	75.7524	122.816	70.4178	124.4	114.8445	-8.8234	132.3626	380.5361	3593.3541
0.1915	70.7886	75.755	122.8289	70.4238	124.4644	115.5184	-8.3509	132.7185	379.327	3592.0724
0.1916	70.7622	75.7646	122.8143	70.4339	124.5279	115.087	-8.6294	132.625	380.2426	3595.5903
0.1917	70.7632	75.7759	122.8384	70.4188	124.6384	115.5779	-8.7439	131.7641	379.4595	3591.8271
0.1918	70.7711	75.7608	122.799	70.4361	124.7346	115.322	-8.3208	131.313	380.4973	3590.9176
0.1919	70.7659	75.7762	122.8007	70.4315	124.7939	113.5875	-8.0812	131.2833	380.4658	3593.1841
0.1919	70.7679	75.7854	122.7988	70.454	124.8469	114.9257	-8.5998	133.1957	380.095	3592.7471
0.192	70.7627	75.7677	122.9121	70.4241	124.9347	114.1775	-8.4107	131.7232	379.4563	3593.3782
0.1921	70.7864	75.7674	122.8391	70.4929	124.9515	115.0146	-8.594	131.9302	380.2328	3592.1108
0.1922	70.7765	75.7636	122.8225	70.4576	125.0347	116.5296	-8.5055	132.3219	380.0101	3592.4244
0.1922	70.7708	75.7591	122.8418	70.4516	125.0757	114.9577	-8.5931	131.9161	378.7815	3592.9541
0.1923	70.7601	75.7779	122.8068	70.4441	125.1163	115.8886	-8.5636	132.0189	380.1762	3592.6488
0.1924	70.7599	75.7751	122.8714	70.4106	125.2232	115.1316	-8.3853	131.3722	379.5726	3591.0057
0.1925	70.7742	75.7689	122.9538	70.3953	125.3503	113.9917	-8.367	132.2185	379.0743	3593.5545
0.1926	70.7701	75.7801	122.8899	70.4475	125.3738	114.8752	-8.4046	131.9376	380.8517	3593.5305
0.1927	70.7764	75.7769	122.8503	70.4677	125.4038	115.5566	-8.7233	133.0366	379.6448	3594.9014
0.1928	70.7926	75.7975	122.8537	70.487	125.507	116.0122	-8.8663	132.4328	378.7365	3594.3159
0.1929	70.7537	75.7616	122.8537	70.4613	125.512	115.673	-8.5398	133.0084	379.772	3592.9617
0.193	70.7755	75.7728	122.9009	70.4714	125.609	114.8259	-8.4013	132.4808	379.8716	3594.5243
0.1931	70.7625	75.8093	122.9091	70.4716	125.6889	114.6662	-8.5096	132.3296	379.1099	3594.0197
0.1932	70.7599	75.77	122.9475	70.4707	125.7478	115.2375	-8.6922	132.7765	379.6723	3593.9793
0.1933	70.7757	75.8087	122.9468	70.4903	125.7819	116.0596	-8.4566	132.2369	379.927	3593.2339
0.1935	70.7732	75.7835	122.9375	70.4958	125.8555	116.5064	-9.2825	132.623	379.4912	3589.6651
0.1935	70.7427	75.814	122.9444	70.4784	125.8886	114.525	-8.6061	132.6336	382.2984	3592.4941
0.1936	70.7627	75.8135	122.9557	70.4688	125.9454	114.7637	-8.4996	132.588	379.7941	3592.9614
0.1939	70.7708	75.8054	123.0313	70.4428	126.0899	114.2495	-8.4275	132.1706	379.3006	3592.5524
0.194	70.7732	75.7959	123.0593	70.4369	126.1335	114.8343	-8.3324	132.4661	379.1573	3594.2999
0.1941	70.7609	75.799	122.9804	70.5095	126.137	117.1437	-8.5708	133.2237	378.8805	3590.7012
0.1943	70.7654	75.8196	123.0205	70.4977	126.2149	115.633	-8.4208	132.7574	379.0516	3591.0451
0.1944	70.762	75.8015	123.0334	70.4718	126.3136	114.5801	-8.5711	132.4109	379.9679	3592.1108
0.1945	70.7566	75.8023	123.0985	70.4796	126.3795	114.7891	-8.5347	133.7891	379.185	3594.8129
0.1946	70.7474	75.7982	123.099	70.4596	126.4248	114.7739	-8.5748	133.7891	380.0654	3591.9916
0.1947	70.7505	75.8047	123.0817	70.4919	126.4428	116.6157	-8.9019	133.6623	380.3281	3592.8697

0.1948	70.767	75.823	123.1342	70.4829	126.4873	116.1469	-8.8071	132.1076	379.6501	3595.0613
0.1949	70.7481	75.8242	123.1652	70.4723	126.5453	114.6263	-8.4918	133.2947	379.8938	3594.84
0.195	70.7614	75.8174	123.1522	70.4681	126.59	114.6299	-8.419	133.22	381.4996	3592.9374
0.1951	70.7549	75.8237	123.1535	70.5067	126.605	115.7601	-9.289	132.7079	381.3079	3594.1041
0.1951	70.7688	75.812	123.1901	70.4507	126.6079	114.5212	-8.8648	133.5341	379.1352	3594.1957
0.1952	70.7537	75.842	123.1759	70.5175	126.6275	116.1483	-8.7509	132.4286	379.7402	3592.3408
0.1953	70.7765	75.8248	123.1542	70.511	126.6543	116.4795	-8.4603	132.9021	379.0798	3591.3103
0.1953	70.7714	75.84	123.2106	70.4691	126.743	116.5863	-8.8275	132.9354	379.8661	3592.7209
0.1954	70.7818	75.8578	123.1838	70.4987	126.7235	116.6815	-8.3976	132.6761	380.6671	3592.9464
0.1955	70.7647	75.8156	123.1737	70.508	126.7609	115.2737	-8.4982	132.6435	380.1263	3592.6568
0.1957	70.7813	75.8347	123.2395	70.4809	126.8242	115.6648	-8.371	133.3456	379.6058	3592.6248
0.1957	70.7594	75.823	123.2497	70.4939	126.8543	116.0122	-8.681	132.9945	379.5671	3593.1297
0.1959	70.7737	75.8254	123.2464	70.4797	126.9194	116.2825	-8.5254	134.0547	3592.5861	
0.196	70.7602	75.8288	123.2602	70.5097	126.9021	117.3601	-8.8486	133.7891	379.8827	3591.7912
0.1961	70.7664	75.8059	123.2306	70.5588	126.9275	118.081	-8.7428	134.09	380.7359	3576.2871
0.1962	70.7609	75.8347	123.2505	70.5662	126.9522	116.3606	-8.441	134.0256	380.2537	3561.4945
0.1963	70.7681	75.8597	123.2617	70.5445	127.0157	116.4878	-8.5829	134.6465	378.9635	3550.4098
0.1964	70.7632	75.8296	123.2266	70.5572	126.9806	118.2142	-9.0719	133.9204	380.0315	3542.1327
0.1965	70.7829	75.8311	123.2125	70.5912	126.9816	118.5482	-8.7639	132.7284	379.7055	3522.3893
0.1966	70.7676	75.8311	123.2188	70.5695	126.9828	116.7015	-8.5362	134.5578	379.999	3522.5577
0.1967	70.7788	75.8347	123.2428	70.5558	126.937	118.786	-9.184	133.985	379.257	3504.5079
0.1967	70.7793	75.8352	123.2567	70.5905	126.8837	118.2993	-8.5632	133.5415	378.8749	3506.2071
0.1968	70.7862	75.8427	123.1823	70.5803	126.8769	117.8944	-8.9979	132.3473	379.576	3500.4115
0.1969	70.7759	75.8471	123.237	70.5825	126.8076	118.2471	-8.7323	133.5739	379.3218	3490.4144
0.1969	70.7747	75.8612	123.2351	70.5862	126.755	117.1659	-8.7466	133.1461	380.5195	3487.9569
0.197	70.7939	75.8548	123.2759	70.5718	126.7584	118.46	-8.4407	133.1534	380.6302	3472.504
0.1971	70.7637	75.8298	123.2381	70.6122	126.7231	117.3434	-8.6325	133.8334	378.8583	3469.9713
0.1972	70.7869	75.8167	123.2542	70.6001	126.6365	117.8828	-8.4924	133.5103	379.4065	3453.5384
0.1973	70.7984	75.8305	123.2131	70.6412	126.5645	119.6155	-9.2617	133.779	379.523	3445.5653
0.1974	70.7755	75.8441	123.2669	70.6444	126.5377	119.3963	-8.9148	134.1476	380.2592	3435.9396
0.1976	70.8089	75.8264	123.2222	70.6578	126.3758	120.0438	-9.0286	134.2138	377.5527	3421.0631
0.1976	70.8342	75.8467	123.2532	70.6508	126.367	118.0967	-8.5946	133.7891	379.8606	3420.5829
0.1977	70.8016	75.8459	123.2318	70.67	126.259	120.4534	-9.1213	133.4184	378.7603	3404.3961
0.1978	70.7689	75.8547	123.2105	70.685	126.1783	119.2538	-8.4025	133.3795	379.6819	3405.7224
0.1978	70.7936	75.8648	123.1898	70.6702	126.2215	119.4827	-9.2615	133.7854	379.0355	3401.5873
0.1979	70.7921	75.8388	123.2242	70.6916	126.0966	120.2108	-8.3922	134.3764	379.6925	3386.8014
0.198	70.7882	75.8543	123.2356	70.6761	126.0553	118.015	-8.8701	133.6043	379.1629	3386.3829
0.1981	70.7989	75.8457	123.1113	70.7031	125.9743	120.01	-8.9082	132.7291	380.9849	3385.9811
0.1981	70.7885	75.8469	123.1419	70.6901	125.9469	118.9607	-8.3813	133.608	379.2016	3366.261
0.1982	70.8087	75.8286	123.1616	70.6837	125.8815	119.4689	-9.2151	133.5103	379.4171	3368.9308
0.1983	70.7872	75.8686	123.1918	70.6799	125.8323	119.0322	-8.7275	133.815	378.731	3360.9513
0.1983	70.7918	75.8477	123.0851	70.7366	125.7231	119.009	-9.1044	135.0382	378.9303	3354.0664
0.1984	70.7899	75.8464	123.1117	70.7231	125.6529	121.6867	-8.8349	132.9094	380.1321	3345.3332
0.1985	70.7839	75.8576	123.1547	70.7338	125.6955	119.2719	-8.8253	133.645	378.6756	3336.177
0.1985	70.7776	75.8586	123.1121	70.7406	125.5723	121.2007	-9.2304	135.5818	379.38	3335.3284
0.1986	70.795	75.8588	123.081	70.7161	125.4482	120.7093	-8.7119	135.2495	379.7561	3320.7851
0.1987	70.7857	75.8645	123.0957	70.7603	125.4671	121.8803	-9.4526	134.8017	379.0466	3319.8745
0.1987	70.7786	75.8425	123.0399	70.7766	125.3332	122.6997	-9.251	134.3658	379.29	3318.8608
0.1988	70.7676	75.8311	123.0735	70.7785	125.2431	119.9964	-8.5667	134.1808	379.6058	3303.1392
0.1989	70.7962	75.8698	123.0477	70.7822	125.2385	121.8004	-8.8212	134.1572	379.1205	3299.5258
0.199	70.7727	75.8566	123.0725	70.7698	125.1997	120.4925	-8.8824	134.9089	379.3733	3295.6371
0.199	70.8016	75.8605	123.0372	70.769	125.0635	119.9576	-9.0863	134.0335	379.5124	3284.9288
0.1992	70.8094	75.8551	123.0972	70.8002	125.0349	118.9282	-8.6198	134.1586	378.7254	3274.2291

0.1992	70.807	75.8537	123.043	70.7749	124.9405	120.488	-8.7643	133.8921	379.7402	3266.4218
0.1993	70.7859	75.8648	123.0636	70.7683	124.8517	121.0954	-9.2112	134.8571	379.8052	3266.3584
0.1994	70.7835	75.8815	123.0786	70.7722	124.8354	120.0535	-8.3804	134.4612	379.3006	3250.3605
0.1994	70.8104	75.8888	123.0095	70.8017	124.714	122.3753	-9.2355	133.4537	378.6597	3250.2685
0.1995	70.8043	75.8806	123.0274	70.7645	124.691	119.5171	-8.7655	134.5208	380.6025	3249.4708
0.1996	70.7974	75.8808	123.0165	70.7917	124.635	120.3779	-8.8784	134.2703	379.1046	3230.8339
0.1997	70.7894	75.863	122.9986	70.8076	124.5122	120.6435	-9.1839	134.9455	379.1364	3218.4294
0.1998	70.7843	75.8822	122.9396	70.823	124.4366	121.9648	-9.3603	134.6627	378.7815	3214.8032
0.1999	70.8049	75.8938	122.9717	70.7969	124.3361	122.3341	-9.0261	134.5382	379.8273	3201.4851
0.2	70.785	75.861	122.9766	70.8218	124.2398	121.6769	-8.9365	134.7511	379.9044	3199.0332
0.2001	70.8023	75.8862	122.9086	70.855	124.1335	122.5594	-8.6275	135.2599	379.2847	3181.6399
0.2002	70.8023	75.8905	122.8699	70.8323	124.0211	123.6939	-8.9061	134.8076	379.1099	3178.5789
0.2003	70.7816	75.8681	122.8496	70.861	123.8999	123.7772	-8.8657	134.7573	379.3345	3165.3615
0.2004	70.7798	75.8535	122.8475	70.8411	123.8293	123.5358	-8.7717	134.2562	378.808	3163.9129
0.2005	70.79	75.8969	122.8863	70.8781	123.762	122.1497	-8.5693	134.0182	378.5759	3154.1084
0.2006	70.7635	75.881	122.8577	70.8858	123.7131	123.5749	-8.8379	135.1965	378.9987	3145.2449
0.2007	70.7706	75.8877	122.8352	70.8692	123.5837	122.8975	-9.0057	134.6612	378.8638	3131.3779
0.2007	70.7745	75.8584	122.7576	70.9098	123.4912	123.99	-8.715	134.1513	379.3013	3129.8952
0.2008	70.7905	75.8999	122.8197	70.8636	123.446	122.8808	-8.6268	135.6147	379.8661	3132.1394
0.2009	70.7843	75.8895	122.7699	70.8814	123.32	122.4455	-8.6446	134.4223	379.327	3129.0302
0.201	70.8207	75.8612	122.7127	70.8792	123.2842	123.6091	-8.7604	135.0567	380.6801	3127.4987
0.201	70.7872	75.89	122.7851	70.8506	123.2732	122.5877	-8.489	135.4015	379.2953	3125.6646
0.2011	70.7884	75.862	122.7675	70.8716	123.1911	122.5362	-8.7117	134.3658	379.5336	3109.9636
0.2012	70.787	75.8836	122.7341	70.845	123.5942	123.6317	-8.7797	134.6317	382.1142	3112.5347
0.2012	70.7608	75.8978	122.6845	70.8991	123.0223	122.3362	-8.6655	135.6525	379.7825	3104.6891
0.2013	70.7944	75.8936	122.665	70.9019	122.9371	123.1335	-9.0813	134.676	378.7753	3093.5232
0.2014	70.761	75.8591	122.6154	70.9432	122.8506	123.5784	-8.4131	135.0233	379.7931	3087.1634
0.2015	70.7938	75.8844	122.505	71.0014	122.7642	123.3163	-8.309	134.7299	379.7614	3038.2434
0.2015	70.783	75.8664	122.4957	71.0016	122.7119	124.5496	-8.2377	134.4859	379.7031	2962.9047
0.2016	70.7556	75.8752	122.4253	71.0449	122.5978	125.4224	-8.4383	134.6206	378.3766	2924.8478
0.2017	70.763	75.8877	122.5005	71.0171	122.608	125.6983	-8.6757	134.8534	380.6081	2837.3081
0.2017	70.7696	75.8918	122.454	71.0309	122.5092	124.0764	-8.5283	135.2932	379.6944	2834.7353
0.2018	70.7696	75.87	122.3824	71.0762	122.4243	126.3267	-8.9256	134.2173	378.9722	2836.438
0.2019	70.7678	75.8772	122.3585	71.0557	122.3064	126.2714	-8.9449	135.3228	380.2925	2836.0738
0.202	70.7627	75.8772	122.2137	71.1068	122.1042	126.173	-8.6685	134.5504	380.071	2790.5968
0.2021	70.7696	75.8739	122.0811	71.2087	121.9742	125.7029	-8.8569	135.0012	379.4342	2699.8512
0.2024	70.7698	75.9044	122.1636	71.0942	121.8619	125.7927	-8.8761	135.3096	378.8716	2662.324
0.2024	70.7499	75.89	122.1655	71.1495	121.8214	127.2301	-9.3304	134.5799	378.443	2662.4693
0.2025	70.7673	75.8997	122.1263	71.1247	121.7348	127.8767	-9.0234	134.7684	379.2515	2622.0498
0.2026	70.7694	75.882	122.1445	71.1528	121.6542	126.3107	-8.9742	135.2742	379.5972	2609.0878
0.2027	70.7386	75.8903	122.1008	71.1301	121.5842	127.1753	-9.344	135.299	378.5961	2612.9977
0.2028	70.7552	75.8678	122.0261	71.1466	121.4666	127.656	-9.3568	135.1152	379.2476	2566.8914
0.2028	70.7517	75.9071	122.1188	71.0838	121.5301	126.3959	-9.0221	134.9162	378.5814	2560.4226
0.2029	70.7714	75.8859	122.1178	71.0955	121.4642	127.4205	-9.5098	135.7441	378.6424	2560.5108
0.203	70.7602	75.8951	122.1093	71.0613	121.4383	127.9863	-9.2902	134.3841	379.3124	2559.2684
0.2031	70.7568	75.93	122.1091	71.0381	121.4031	126.3894	-9.1336	135.6554	379.4065	2563.4683
0.2032	70.7683	75.9058	122.0759	71.0807	121.3075	126.369	-9.2448	135.4151	378.7697	2529.8455
0.2032	70.7622	75.8818	122.1408	70.9939	121.31	128.3597	-9.2483	135.4447	379.2847	2529.5168
0.2034	70.7344	75.8866	122.1598	70.9853	121.2086	127.9306	-9.2557	135.2212	379.2264	2527.1022
0.2035	70.7801	75.9146	122.1352	70.9772	121.1362	127.4161	-8.8676	134.8748	378.5749	2526.5503
0.2036	70.7588	75.9105	122.0662	70.9726	121.072	127.7262	-9.4916	134.539	379.8938	2525.5689
0.2037	70.7367	75.9251	122.0976	70.9471	121.0496	127.2775	-9.0761	134.8128	378.9414	2525.2048
0.2037	70.7701	75.9178	122.0851	70.9752	120.9971	128.0318	-9.306	134.373	379.3068	2526.399

0.2038	70.7625	75.9025	121.9868	70.9768	120.8963	127.8897	-9.4569	134.7167	380.1872	2525.7578
0.204	70.7757	75.9054	122.0452	70.9315	120.848	128.4095	-9.3623	134.9526	379.6078	2526.6269
0.204	70.7542	75.901	122.0359	70.9269	120.8077	127.7706	-9.5118	135.5924	379.0463	2525.4463
0.2042	70.7686	75.9188	121.9405	70.9474	120.6752	128.618	-9.4969	135.4041	378.7586	2525.0124
0.2042	70.795	75.9124	121.9028	70.908	120.579	127.8684	-9.1911	135.6489	378.9033	2525.5613
0.2043	70.7454	75.9263	121.9091	70.9462	120.6044	128.8111	-9.5878	134.8995	380.8154	2525.2623
0.2044	70.7496	75.9256	121.9203	70.8941	120.563	128.5597	-9.486	135.7338	378.7815	2524.7256
0.2045	70.7706	75.9234	121.773	70.9574	120.4253	129.179	-9.861	135.7478	379.556	2528.0741
0.2046	70.772	75.9285	121.7639	70.9051	120.3779	127.7191	-9.4976	135.9954	379.6395	2527.7999
0.2047	70.7862	75.8956	121.8014	70.9021	120.3388	126.329	-9.2375	135.4004	378.659	2524.1949
0.2047	70.8031	75.9254	121.7371	70.9266	120.2819	129.0199	-9.805	135.7514	379.8779	2526.6346
0.2048	70.7558	75.9366	121.7742	70.9177	120.2143	129.2654	-9.8564	134.8349	377.546	2525.846
0.2049	70.7594	75.9325	121.6944	70.9025	120.1668	128.4136	-9.8784	135.8882	379.2736	2526.5673
0.205	70.776	75.9287	121.6401	70.9312	120.0701	129.0044	-9.9352	135.2599	379.7387	2527.2406
0.2051	70.7544	75.9085	121.59	70.93	119.9914	127.5983	-9.6319	134.9702	378.9669	2523.3533
0.2052	70.7642	75.9061	121.5962	70.9266	119.9713	128.0505	-9.9386	136.2251	379.5018	2526.6576
0.2053	70.7786	75.9254	121.5529	70.9435	119.885	128.4539	-9.7173	134.9384	378.8239	2526.5043
0.2053	70.7676	75.9356	121.535	70.9438	119.8372	128.3272	-10.2524	136.3354	379.1629	2526.8959
0.2054	70.7799	75.9461	121.4655	70.9567	119.8048	128.0008	-9.7648	135.3202	379.7402	2527.0716
0.2055	70.7479	75.9262	121.5353	70.8751	119.8004	127.6918	-9.7636	135.2784	378.1219	2527.457
0.2056	70.7674	75.941	121.4192	70.9313	119.725	128.772	-10.1817	136.0802	379.5442	2527.3246
0.2057	70.7625	75.9432	121.4916	70.8764	119.6342	127.1725	-10.3873	136.073	379.2791	2527.1284
0.2058	70.7507	75.9341	121.4067	70.9045	119.5543	127.5432	-10.2594	135.6554	378.958	2527.6093
0.2059	70.7755	75.949	121.3783	70.887	119.524	129.2492	-10.6971	135.3874	378.5855	2523.7673
0.206	70.7777	75.9341	121.3105	70.8787	119.4513	127.6916	-10.8704	136.6705	379.5018	2527.7002
0.2062	70.7663	75.9318	121.3163	70.8427	119.3489	127.1456	-10.7774	136.2356	378.1828	2526.936
0.2063	70.7774	75.9388	121.3365	70.8369	119.3125	126.699	-10.6945	135.7267	378.8768	2525.5536
0.2064	70.7745	75.9247	121.3496	70.8333	119.3099	127.7039	-11.2407	135.6997	377.8228	2525.4693
0.2065	70.7439	75.959	121.2484	70.8274	119.1741	129.2208	-11.2271	136.1085	379.3218	2524.7716
0.2065	70.7652	75.9363	121.2524	70.8095	119.1591	128.7845	-10.9922	135.5888	379.2529	2527.7079
0.2066	70.7533	75.957	121.2649	70.8386	119.1176	128.4907	-10.732	135.6849	378.8362	2527.489
0.2067	70.7618	75.95	121.2027	70.8222	119.0663	127.8542	-10.5769	134.7935	379.237	2524.2733
0.2068	70.7471	75.9451	121.1877	70.8142	118.9963	129.0733	-10.495	135.2106	378.5167	2528.1449
0.2069	70.7706	75.9612	121.1569	70.7949	118.9272	128.4628	-10.0205	136.4089	378.5591	2526.3203
0.2069	70.7576	75.9556	121.1545	70.7729	118.8961	127.8719	-10.2526	136.9462	378.7285	2527.6466
0.207	70.7719	75.9654	121.1564	70.7992	118.8542	129.0741	-9.9455	135.8327	379.2625	2525.6616
0.2071	70.7727	75.9764	121.123	70.7905	118.8207	128.2092	-9.6721	135.8734	378.6867	2523.738
0.2072	70.7592	75.9552	121.0286	70.8293	118.7212	128.6263	-8.7189	136.4536	378.8306	2528.547
0.2073	70.7757	75.9761	120.9955	70.7813	118.6606	128.6912	-8.2116	136.2039	378.183	2522.4487
0.2074	70.7847	75.9807	120.9881	70.8007	118.5783	128.499	-7.6683	136.764	379.7996	2526.4792
0.2075	70.776	75.9746	120.8866	70.84	118.5617	129.0137	-8.3978	136.0619	378.7254	2525.7258
0.2076	70.7703	75.9829	120.8556	70.8508	118.4799	129.2901	-9.0483	137.0735	378.3896	2529.3409
0.2077	70.7657	75.9783	120.889	70.7897	118.4919	129.0057	-9.3972	136.1721	379.7137	2529.4099
0.2078	70.7825	75.9926	120.7534	70.844	118.3896	128.5952	-9.6811	136.3983	379.2317	2526.9719
0.2079	70.777	75.9909	120.79	70.8	118.3601	129.0239	-9.7742	135.1047	379.8218	2525.7899
0.208	70.766	75.9901	120.7866	70.7735	118.3317	127.1131	-9.3027	136.4832	379.1462	2527.1204
0.2081	70.7615	75.9805	120.761	70.8163	118.2936	129.4456	-9.7141	137.0116	379.3013	2526.3429
0.2082	70.7592	75.968	120.6171	70.8352	118.1646	129.9556	-9.7509	136.4314	378.67	2526.6314
0.2084	70.7734	75.9848	120.5275	70.8457	118.0549	129.7513	-9.6243	137.4551	379.4563	2524.6197
0.2084	70.775	76.0095	120.504	70.7966	118.0587	128.4628	-9.3053	136.317	379.5071	2525.6916
0.2085	70.763	75.9926	120.5386	70.7905	118.0312	128.4833	-9.5748	136.8614	378.2572	2526.0213
0.2088	70.7722	75.9886	120.3928	70.8102	117.8551	126.4396	-9.2705	132.9945	378.1219	2524.4995
0.2089	70.7667	75.9865	120.3918	70.8677	117.7983	124.1098	-9.1559	130.4455	378.8345	2525.2776

0.209	70.7701	76.0095	120.1951	70.8572	117.7975	118.3626	-8.9668	126.2319	379.147	2526.1899
0.209	70.7618	75.9914	120.0056	70.9151	117.7251	111.3431	-8.8954	119.6605	378.8557	2522.004
0.2091	70.7431	76.0156	119.9101	70.94	117.6321	108.7739	-9.3356	115.4663	378.3101	2524.7479
0.2092	70.7893	76.0082	119.8109	70.9842	117.5754	103.4371	-9.2762	112.3953	379.5117	2524.9162
0.2092	70.7727	75.9789	119.7482	71.0554	117.5051	98.0344	-8.8034	107.0773	378.7088	2526.0994
0.2093	70.7737	75.996	119.6423	71.0471	117.4429	95.6201	-9.0647	103.9796	378.379	2526.0366
0.2094	70.7544	75.9865	119.5759	71.0695	117.3405	91.6571	-8.9502	99.6741	378.7285	2527.9072
0.2094	70.7755	75.9734	119.5487	71.1101	117.2679	87.8577	-9.1149	97.0087	377.8387	2525.4769
0.2095	70.7786	76.0001	119.501	71.1017	117.2528	86.4347	-9.4133	94.2684	377.4851	2527.1524
0.2096	70.8013	75.9998	119.459	71.1073	117.2058	83.7881	-8.9767	93.5995	377.6124	2526.5994
0.2097	70.7962	76.01	119.4198	71.1106	117.1541	83.1992	-9.4754	91.1936	380.2537	2526.367
0.2097	70.7847	76.0011	119.4833	71.1167	117.1675	81.3924	-9.2727	89.9113	378.659	2526.7036
0.2098	70.7904	75.9956	119.4346	71.1304	117.0819	81.8768	-9.4285	90.6247	377.5898	2526.2283
0.2099	70.7781	76.0004	119.3897	71.1309	117.0538	82.7245	-9.4793	90.7413	377.129	2524.9863
0.2099	70.7681	75.9922	119.3993	71.1305	117.0335	81.7835	-9.1288	91.1641	378.5095	2527.5532
0.21	70.7666	76.0034	119.3596	71.1078	116.9737	82.0436	-9.5103	91.2084	378.3766	2526.0784
0.2101	70.7757	76.0151	119.3062	71.092	116.932	83.9792	-9.5519	92.2649	378.5167	2523.7136
0.2103	70.7722	75.9861	119.1982	71.1089	116.7872	85.0784	-9.5206	93.0156	378.3544	2526.928
0.2105	70.7747	76.0165	119.1903	71.0908	116.7561	84.985	-9.4913	93.7531	379.1311	2526.8722
0.2106	70.7814	76.0156	119.2023	71.0825	116.7313	84.5545	-9.1487	93.3001	378.5482	2525.9341
0.2106	70.7698	76.0141	119.1606	71.0605	116.7193	84.8482	-9.4387	91.8018	379.7455	2523.8286
0.2107	70.7545	76.0158	119.1078	71.0872	116.6593	85.3502	-9.557	93.6117	378.6438	2527.0102
0.2108	70.7987	76.0126	119.1286	71.0838	116.6676	85.2939	-9.2917	94.4384	378.4707	2524.9884
0.2108	70.8095	76.0131	119.0761	71.0838	116.6201	85.8587	-9.534	94.1353	377.1584	2525.5093
0.2109	70.7994	76.0168	119.0836	71.0527	116.592	85.1503	-9.2893	92.8588	378.4902	2525.2316
0.211	70.8082	75.9841	119.0262	71.0747	116.5585	86.1508	-9.3867	93.8768	378.8133	2523.3303
0.2111	70.8094	75.9951	118.972	71.0852	116.4588	85.6025	-9.2464	93.6506	378.3525	2527.2479
0.2113	70.8246	76.0126	118.9971	71.0766	116.4599	85.814	-9.4825	94.5626	377.219	2526.7879
0.2114	70.7814	76.0207	118.9471	71.0516	116.4085	87.058	-9.507	95.1516	378.9524	2525.0846
0.2115	70.7909	76.0326	118.9464	71.0737	116.3566	85.9562	-9.1839	95.7291	379.2105	2527.4549
0.2115	70.7926	76.0192	118.9047	71.0593	116.3359	85.0208	-9.0734	94.0503	378.6091	2526.5914
0.2116	70.8009	76.0158	118.8758	71.0749	116.2932	86.6661	-9.4326	94.2374	379.1999	2527.0869
0.2117	70.7758	76.0304	118.7746	71.1256	116.2158	85.4806	-8.9331	93.8434	378.2326	2525.7258
0.2117	70.7972	76.0341	118.805	71.0832	116.2391	85.8513	-9.5663	94.0182	378.1089	2525.7759
0.2118	70.8019	76.0314	118.7601	71.1179	116.1869	86.0433	-9.1527	94.559	378.6014	2527.7309
0.2119	70.7962	76.0278	118.6702	71.1109	116.0912	86.8982	-9.1445	95.2071	378.0333	2526.1986
0.212	70.822	76.0256	118.6494	71.1126	116.0805	85.581	-9.2336	94.3571	379.6612	2527.4329
0.2121	70.7992	76.0117	118.6685	71.0854	116.0498	86.4351	-9.0283	95.1812	377.8652	2526.9029
0.2122	70.7898	76.0317	118.6002	71.1211	116.0137	86.064	-9.365	94.8338	379.6446	2527.3127
0.2123	70.7972	76.0438	118.5747	71.1118	115.9823	87.0327	-9.4888	95.1352	379.5601	2526.4813
0.2124	70.7954	76.0271	118.5304	71.1009	115.9639	87.2698	-9.0853	95.7023	378.4098	2524.6918
0.2124	70.7723	76.0287	118.4997	71.1328	115.9478	86.6768	-9.3371	96.4043	378.7815	2530.1918
0.2125	70.8097	76.0159	118.4984	71.1014	115.8993	87.1035	-9.1379	96.131	379.412	2524.8441
0.2126	70.8099	76.0272	118.4604	71.1123	115.8894	87.0384	-9.1629	96.1003	378.4266	2524.4036
0.2127	70.8084	76.0401	118.3719	71.1356	115.7902	89.881	-9.4756	97.0438	378.216	2528.6512
0.2128	70.7857	76.0556	118.3586	71.1246	115.7495	90.509	-9.1347	98.9692	375.7685	2526.8158
0.2129	70.773	76.0514	118.2808	71.156	115.7097	91.9486	-9.1965	101.5405	377.1873	2526.3279
0.213	70.7706	75.9973	118.2991	71.1252	115.725	94.4524	-9.5008	101.6448	377.1584	2525.6857
0.2131	70.7783	76.0533	118.3406	71.1088	115.7039	93.8709	-9.1707	102.735	374.7386	2526.92
0.2131	70.7848	76.0558	118.4429	71.0699	115.7905	95.9649	-9.3491	103.6014	377.2137	2525.7223
0.2132	70.7845	76.0506	118.4966	71.0124	115.8203	98.1036	-9.6031	104.6831	383.506	2527.6849
0.2133	70.7745	76.075	118.5381	70.976	115.779	96.8704	-9.2251	106.3271	387.6958	2523.706
0.2133	70.7645	76.0625	118.4899	71.011	115.7582	99.4557	-9.4594	106.9628	392.8122	2526.375

02134	70.7825	76.056	118.4791	70.9945	115.7502	100.6902	-9.5547	107.6488	401.2969	2523.108
02135	70.8006	76.0667	118.4603	70.9777	115.7505	100.0327	-9.5887	108.2286	404.8932	2526.1516
02135	70.753	76.0606	118.1398	71.0926	115.5374	102.2336	-9.5982	108.5856	409.8825	2526.2283
02136	70.7789	76.0767	118.1078	71.1015	115.5318	102.2665	-9.1731	110.9646	409.8137	2522.7477
02137	70.765	76.0554	118.1838	71.0738	115.6021	102.5286	-9.56	110.0523	409.8669	2524.5075
02138	70.7877	76.0855	118.0884	71.1035	115.5147	103.4465	-9.5273	110.3248	410.5764	2524.9556
02139	70.7658	76.0714	118.0431	71.1088	115.4387	103.608	-9.5421	111.3236	409.961	2527.8417
0214	70.7806	76.0248	118.0575	71.0622	115.4359	103.2217	-9.3403	111.3499	409.6018	2527.0869
0214	70.7884	76.0692	118.0613	71.0979	115.4493	101.2286	-9.1417	109.943	411.0372	2525.9063
02141	70.7755	76.0607	118.0734	71.0606	115.4765	103.8616	-9.4172	111.294	409.7783	2523.9464
02142	70.7684	76.0663	118.0329	71.0779	115.4385	101.8867	-9.1507	111.379	409.8558	2526.0704
02142	70.7591	76.0545	118.0077	71.1262	115.5909	102.2771	-9.554	110.5758	411.0743	2525.5153
02143	70.7772	76.075	117.9584	71.1076	115.3631	102.2736	-9.254	110.3531	410.2798	2526.6499
02144	70.7872	76.0826	117.94	71.0742	115.3447	102.1519	-9.3656	110.346	410.9101	2525.6226
02144	70.7855	76.0614	117.9347	71.0834	115.3131	102.4646	-9.5626	109.9642	410.0044	2525.9983
02145	70.7709	76.051	117.9283	71.1091	115.2863	102.3057	-9.2391	111.5822	410.0496	2525.5174
02146	70.7823	76.0655	117.9111	71.0788	115.2463	102.5908	-9.5009	111.053	410.1209	2528.3442
02147	70.7995	76.0872	117.91	71.1057	115.1829	102.4013	-9.5274	110.2149	409.0418	2524.9483
02148	70.7691	76.0767	117.8965	71.0688	115.2245	102.9649	-9.6618	110.2046	409.4164	2525.3236
02149	70.8165	76.0874	117.8091	71.0895	115.1204	102.4264	-9.2754	111.205	409.8084	2526.7879
02149	70.8003	76.0625	117.8245	71.0848	115.1874	102.9345	-9.5339	111.0796	408.9865	2527.1043
0215	70.8143	76.0943	117.7825	71.1083	115.1379	102.85	-9.3865	110.8246	409.7672	2528.6192
02151	70.805	76.0711	117.8233	71.0527	115.1632	101.8453	-9.3261	111.3216	409.6654	2526.7112
02153	70.8021	76.0682	117.6854	71.1196	115.0421	103.1222	-9.3338	110.4732	408.6167	2527.0869
02154	70.8011	76.0794	117.6522	71.1101	115.0256	102.6717	-9.4538	110.9787	409.0881	2526.3739
02155	70.8138	76.0964	117.578	71.1549	114.9383	104.1775	-9.6695	111.3531	407.9732	2526.7276
02156	70.8026	76.0906	117.5726	71.1289	114.9315	103.0573	-9.4811	111.5196	409.1145	2526.6959
02158	70.8116	76.1094	117.5326	71.1233	114.8733	102.9578	-9.4922	111.1449	407.7481	2526.5579
02161	70.7995	76.105	117.5006	71.0758	114.8057	103.02	-9.5465	112.2068	407.1093	2525.2849
02162	70.8036	76.1091	117.4524	71.1058	114.8225	102.8156	-9.2597	111.3457	408.6653	2527.2406
02162	70.7816	76.1062	117.4259	71.1135	114.7751	104.6878	-9.6066	111.0848	406.9589	2526.4659
02163	70.786	76.1068	117.4135	71.1197	114.7711	104.2063	-9.4809	111.5083	407.6908	2525.9181
02165	70.7672	76.0943	117.3459	71.0734	114.731	104.5403	-9.5198	111.3287	408.4949	2527.4779
02165	70.7602	76.0811	117.3415	71.0973	114.7041	102.9708	-9.0684	111.804	407.425	2523.7861
02166	70.8018	76.085	117.3163	71.1091	114.6846	104.6309	-9.6117	110.6359	406.4451	2526.0596
02167	70.777	76.1157	117.3112	71.0894	114.6513	104.0326	-9.7268	113.9216	406.3286	2525.0765
02168	70.7589	76.1128	117.3424	71.0991	114.6533	104.5074	-9.5746	111.4984	408.0341	2528.2369
02169	70.7733	76.1004	117.306	71.0912	114.6264	103.8712	-9.3143	111.8271	406.6782	2524.672
02169	70.7896	76.1094	117.296	71.0761	114.626	104.1706	-9.6519	112.1983	406.7841	2526.2513
0217	70.7862	76.0892	117.2985	71.0534	114.6335	103.5987	-9.311	110.4514	405.8524	2525.2288
02171	70.7552	76.0921	117.3187	71.0651	114.632	104.5678	-9.586	111.1237	406.1962	2526.6116
02172	70.7757	76.1119	117.3094	71.0799	114.6595	104.4822	-9.8773	112.3546	406.6055	2526.8158
02173	70.7645	76.0965	117.217	71.0835	114.5278	105.4342	-9.7296	112.6826	407.2025	2526.3203
02174	70.7673	76.1086	117.2394	71.0747	114.5668	103.6972	-9.3817	113.249	406.4504	2526.4711
02174	70.7862	76.0938	117.2441	71.0671	114.5142	105.0583	-9.7922	112.5977	404.8932	2524.971
02175	70.7763	76.1201	117.2039	71.0615	114.5113	105.0219	-9.5723	112.362	406.3784	2527.8096
02177	70.7796	76.1165	117.1433	71.0717	114.5187	105.5248	-9.8896	112.0357	407.176	2525.4156
02178	70.7921	76.1231	117.1096	71.0495	114.437	105.4427	-9.584	111.9703	405.7416	2525.6857
02179	70.8085	76.1184	117.2062	71.0675	114.4978	103.4349	-9.415	112.7851	405.9049	2524.8253
0218	70.7875	76.1185	117.172	71.0136	114.4668	103.6443	-9.6594	112.9016	405.0052	2526.0944
02181	70.794	76.1186	117.0856	71.0617	114.4131	103.6082	-9.6206	112.9972	405.3593	2525.9216
02182	70.8116	76.1386	117.1945	70.953	114.4095	103.3967	-9.3661	113.386	405.9525	2525.2776
02183	70.7906	76.1012	117.0248	71.0191	114.342	103.556	-9.5835	113.0605	405.4869	2527.9699

02184	70.8082	76.1157	116.9978	71.0478	114.3707	105.0334	-9.7179	113.5486	405.5023	2528.9192
02185	70.7995	76.1484	117.0088	71.0462	114.3411	103.6517	-9.5008	112.4988	405.5755	2524.2831
02186	70.8106	76.1182	116.9385	71.0433	114.3017	105.2947	-9.6562	112.573	405.317	2524.6796
02186	70.8171	76.1303	116.9365	71.0362	114.2887	103.752	-9.3157	113.4005	404.7837	2527.465
02188	70.7955	76.1274	116.8438	71.0517	114.2261	104.4408	-9.5806	113.4461	404.8403	2525.3389
02188	70.8072	76.1305	116.8604	71.0607	114.2101	106.3921	-9.7825	113.2859	405.0163	2529.4207
0219	70.8146	76.1367	116.8159	71.0868	114.2102	105.4111	-9.705	112.7674	404.9727	2524.833
0219	70.8107	76.1519	116.8207	71.0917	114.1879	106.5435	-9.6028	113.9437	405.4094	2524.5876
02191	70.8031	76.1203	116.7705	71.0869	114.1456	104.7056	-9.6947	112.8346	403.9769	2524.902
02193	70.8131	76.1474	116.691	71.101	114.09	105.2813	-9.9036	113.6087	405.1422	2526.2973
02194	70.8095	76.1328	116.63	71.1448	113.9495	105.9675	-9.5532	113.2637	405.4869	2525.2929
02194	70.7975	76.1586	116.6527	71.1229	113.9774	105.6394	-9.4748	112.9477	406.0691	2520.1717
02195	70.7926	76.1517	116.6818	71.1593	113.9462	105.6861	-9.9313	114.3909	403.8811	2525.6696
02196	70.7728	76.1389	116.6903	71.1491	113.8881	106.4871	-9.6405	114.1531	403.7121	2520.6854
02197	70.7975	76.1259	116.5925	71.1857	113.8168	106.5871	-9.8771	113.1307	404.1137	2525.6937
02198	70.7594	76.1303	116.6528	71.1353	113.8554	106.0375	-9.537	114.3298	404.782	2526.0136
02199	70.7609	76.1506	116.5542	71.1441	113.8486	105.7892	-9.5816	113.7442	404.3186	2525.9101
022	70.7671	76.1644	116.593	71.1427	113.8773	105.6526	-9.6474	113.6924	403.2333	2526.3429
02201	70.7843	76.1576	116.5137	71.1325	113.8598	106.1441	-9.7103	113.9976	404.2418	2527.5086
02201	70.7512	76.1563	116.5027	71.1323	113.8771	105.7242	-9.6463	115.1115	404.6176	2525.5655
02202	70.765	76.1675	116.5194	71.1188	113.8363	105.7678	-9.526	113.8772	403.1115	2526.4391
02203	70.7752	76.1681	116.5364	71.1093	113.8251	105.9655	-9.9557	114.906	403.7704	2521.3524
02203	70.7564	76.1435	116.4867	71.0981	113.801	106.3986	-9.3885	113.6703	403.2942	2524.0105
02204	70.7471	76.1523	116.5145	71.0817	113.7816	105.9247	-9.7904	114.2415	404.5596	2524.0126
02205	70.7673	76.1749	116.5101	71.1093	113.7794	106.3252	-9.5574	114.2357	403.8424	2525.9822
02206	70.7826	76.1608	116.4876	71.1327	113.7882	106.0464	-9.5793	115.1924	403.3308	2526.5579
02207	70.7767	76.1623	116.4613	71.1108	113.7331	106.3307	-9.4878	114.3829	404.0776	2524.8406
02209	70.7712	76.1558	116.4902	71.0786	113.7644	106.1831	-9.5598	114.8787	403.3717	2525.325
02209	70.7901	76.1619	116.4015	71.098	113.7359	106.1626	-9.5737	113.1381	405.9022	2526.5032
0221	70.7625	76.1598	116.3852	71.0814	113.7421	106.5918	-9.8411	114.4981	403.2665	2527.1284
02211	70.7596	76.1744	116.384	71.0563	113.7228	106.8496	-9.9012	114.7045	403.4526	2525.8833
02212	70.8256	76.1896	116.4008	71.0794	113.6976	105.9908	-9.419	114.3355	403.2111	2527.2406
02212	70.7948	76.1705	116.3744	71.0906	113.6869	106.4693	-10.0717	114.2273	403.3996	2525.9906
02213	70.8053	76.1567	116.3438	71.0862	113.697	106.8674	-9.8731	114.8389	402.7058	2526.1133
02215	70.7997	76.1779	116.2896	71.1066	113.6763	106.8843	-9.7788	114.9909	403.1348	2525.1243
02216	70.8089	76.1676	116.2968	71.0748	113.6715	107.0975	-9.8504	114.0965	402.1073	2525.6993
02217	70.8125	76.1664	116.2477	71.0559	113.657	106.6875	-10.0317	114.6015	404.158	2525.0445
02217	70.8155	76.1888	116.2257	71.0903	113.634	107.269	-9.5442	115.1605	402.817	2524.764
02218	70.8289	76.17	116.2499	71.094	113.6342	106.4747	-9.9166	115.4663	402.8014	2525.0204
02219	70.7985	76.1677	116.271	71.095	113.6653	107.5356	-9.7533	115.1005	402.7515	2526.383
02221	70.8	76.1947	116.2109	71.0925	113.5526	107.5765	-9.8332	113.9363	403.0229	2523.8983
02222	70.7806	76.1754	116.2041	71.0779	113.5508	107.2941	-9.8442	115.6548	401.9819	2525.4613
02223	70.7918	76.1701	116.1826	71.0707	113.5429	106.99	-9.4799	115.3161	402.2238	2524.304
02224	70.8049	76.1843	116.2061	71.039	113.5703	107.1324	-9.503	115.2372	402.3861	2528.1864
02225	70.8128	76.2049	116.1122	71.0888	113.5039	108.0939	-9.8904	115.252	401.9043	2526.8238
02226	70.8018	76.1922	116.0735	71.0864	113.472	107.4139	-9.8226	115.5105	402.6369	2526.6959
02227	70.7975	76.1903	116.103	71.0432	113.48	107.5703	-9.8836	115.2277	402.4092	2524.8023
02228	70.7993	76.1736	116.0167	71.1062	113.4433	107.2625	-9.4624	115.5365	402.5633	2523.0167
02229	70.8234	76.1893	116.0179	71.0687	113.4595	107.5827	-9.7085	115.6979	402.3668	2526.3203
02232	70.8256	76.182	115.9433	71.1131	113.3173	108.6791	-10.0603	116.5454	401.7438	2527.1925
02233	70.8109	76.1915	115.9543	71.1211	113.3096	106.7697	-9.4373	115.4822	402.4463	2527.1942
02234	70.8393	76.1754	115.953	71.1128	113.2544	106.8649	-9.5743	116.2941	400.0992	2526.1986
02234	70.8092	76.1835	115.8667	71.1371	113.1631	108.7033	-9.7751	116.3865	402.3584	2528.3627

0.2235	70.833	76.2021	115.8567	71.1907	113.1355	109.2077	-9.8216	114.6755	402.076	2525.9341
0.2236	70.8302	76.1961	115.9288	71.1391	113.1404	107.9745	-9.6486	115.4469	402.478	2527.0102
0.2238	70.8197	76.1881	115.8276	71.1506	113.1397	108.8444	-9.8314	115.864	402.0384	2527.3246
0.2239	70.8044	76.1914	115.7794	71.1706	113.1308	109.3062	-9.8626	116.3126	401.6164	2526.6475
0.224	70.8358	76.1798	115.739	71.1262	113.1876	108.9831	-9.8792	115.9665	401.8901	2524.7256
0.2241	70.8158	76.1915	115.6524	71.1672	113.1536	109.3616	-9.7595	115.2807	402.7058	2526.9182
0.2242	70.812	76.171	115.6285	71.1596	113.11	108.8129	-9.7246	114.9378	401.6718	2525.846
0.2242	70.8128	76.2081	115.6619	71.1159	113.1392	107.0105	-9.4865	115.917	401.5882	2525.2393
0.2243	70.7982	76.2057	115.6449	71.1177	113.1515	109.2495	-9.8051	116.3126	401.4503	2525.4132
0.2244	70.816	76.1869	115.563	71.1542	113.0905	109.7712	-9.7571	114.6374	401.8901	2524.8406
0.2245	70.8143	76.2013	115.5488	71.1652	113.1004	108.9114	-9.6427	115.9504	401.2675	2525.6696
0.2246	70.8182	76.2256	115.5609	71.1448	113.0597	107.5969	-9.6214	117.0729	401.2757	2524.074
0.2247	70.8278	76.1986	115.6111	71.1887	113.086	108.29	-9.7595	115.9948	401.2334	2525.8986
0.2247	70.7942	76.1889	115.5103	71.1642	112.9968	108.6977	-9.4479	116.7709	401.4558	2526.1185
0.2248	70.783	76.1808	115.5347	71.162	113.0599	107.2317	-9.4586	116.5215	401.2281	2525.017
0.2249	70.7933	76.191	115.5438	71.1713	113.0594	107.5392	-9.6126	115.9524	401.567	2524.7026
0.225	70.8077	76.2078	115.5305	71.1504	113.0485	108.1407	-9.8333	116.4048	401.4664	2526.3279
0.2251	70.7995	76.2121	115.4858	71.157	113.0048	108.2128	-9.7242	116.4826	401.1679	2525.3971
0.2252	70.8129	76.2056	115.5317	71.1589	113.0328	108.9751	-9.5711	117.3381	401.4664	2525.9139
0.2253	70.7939	76.1988	115.4933	71.1622	112.9873	108.9374	-9.9133	116.3348	401.2232	2524.796
0.2254	70.7784	76.2322	115.3935	71.1547	112.9281	108.9706	-9.8511	114.9485	400.9685	2525.6303
0.2255	70.7933	76.2008	115.4459	71.135	112.9806	108.7574	-9.3997	116.8714	401.334	2527.1176
0.2256	70.7857	76.2059	115.3789	71.1629	112.9304	109.0117	-9.8466	117.0628	401.7493	2526.4311
0.2256	70.7882	76.2176	115.3703	71.1603	112.9456	108.3468	-9.599	117.4229	401.2069	2524.8176
0.2257	70.789	76.2143	115.3701	71.1565	112.9993	109.9583	-9.8711	118.0865	399.9608	2526.5353
0.2258	70.7872	76.2142	115.3317	71.1772	112.943	108.6658	-9.6187	116.7265	401.4558	2526.7802
0.2258	70.8011	76.2183	115.353	71.1257	112.9499	108.7476	-9.6323	116.6664	400.5607	2526.2743
0.2259	70.8065	76.2237	115.3158	71.1487	112.927	108.0705	-9.4698	116.6664	400.4707	2522.9547
0.226	70.7906	76.2312	115.311	71.155	112.9151	108.8482	-9.8878	117.9793	401.1845	2526.2067
0.2261	70.7965	76.2088	115.3143	71.1546	112.9351	108.1149	-9.6317	116.7866	400.8467	2525.5919
0.2262	70.796	76.2376	115.2486	71.1535	112.8622	109.7419	-9.9033	116.8821	401.4134	2525.9446
0.2263	70.8026	76.2247	115.2357	71.1721	112.8493	110.3674	-9.9625	117.5113	401.138	2525.6379
0.2264	70.7939	76.2421	115.2641	71.1735	112.8806	108.7925	-9.6991	118.0976	400.4037	2526.0464
0.2266	70.8068	76.2385	115.1954	71.1921	112.833	109.8361	-9.9924	117.0835	401.7153	2526.6576
0.2267	70.7686	76.2151	115.1356	71.2068	112.7347	110.5211	-9.846	117.9956	401.1062	2523.8593
0.2268	70.7888	76.2166	115.1773	71.1872	112.7863	110.7395	-9.8481	118.0569	399.7891	2527.2165
0.2269	70.7834	76.2266	115.1412	71.1861	112.7377	110.2351	-9.9372	118.2232	400.4923	2522.0228
0.227	70.764	76.2324	115.1407	71.19	112.7135	110.9512	-9.9522	117.7587	401.0268	2526.3739
0.2271	70.7732	76.2266	115.1173	71.1949	112.7337	110.2528	-9.9721	117.8204	400.808	2527.8818
0.2273	70.7837	76.2396	115.0864	71.1838	112.7079	110.9522	-10.1241	118.1087	399.8777	2526.5593
0.2274	70.7706	76.222	115.088	71.1631	112.6727	110.7317	-9.541	117.6491	400.137	2526.3049
0.2275	70.7916	76.222	115.1375	71.1466	112.7515	108.799	-9.5923	118.19	401.2399	2526.1586
0.2276	70.7738	76.2081	115.081	71.1999	112.6993	109.5295	-9.9302	117.9849	399.1995	2527.1482
0.2276	70.7602	76.2314	115.1212	71.1146	112.7327	109.5087	-9.4697	119.55	400.4259	2526.7757
0.2277	70.7883	76.2543	115.1267	71.1509	112.7006	108.6893	-9.8233	118.5891	400.8246	2525.2048
0.2278	70.8003	76.1975	114.9941	71.1943	112.623	109.8254	-9.6452	117.2624	400.6751	2522.3114
0.2279	70.7865	76.2281	115.0029	71.1716	112.6547	108.7618	-9.6525	117.5254	400.9421	2524.741
0.228	70.8011	76.2493	114.962	71.1846	112.6135	109.4706	-9.408	117.2439	398.8367	2525.7899
0.2281	70.805	76.2052	114.927	71.2163	112.5979	109.3865	-9.9096	118.4869	400.3806	2525.5229
0.2282	70.7995	76.2146	114.8959	71.2143	112.5148	110.7154	-9.6419	118.2934	400.0494	2525.3891
0.2283	70.8016	76.2396	114.8759	71.2321	112.5298	110.4488	-9.7395	118.6224	400.3761	2527.8257
0.2285	70.8102	76.2355	114.863	71.1986	112.5269	109.4854	-9.6768	118.6334	400.5311	2526.0864
0.2286	70.8226	76.2178	114.8489	71.2295	112.4479	109.9516	-9.7303	118.5753	400.3012	2525.7836

0.2288	70.7828	76.2537	114.8073	71.209	112.4757	110.1453	-9.5909	118.3879	399.7345	2525.4616
0.2288	70.7848	76.2507	114.7814	71.229	112.5049	111.6096	-10.2183	117.9461	400.5501	2527.9762
0.2289	70.8197	76.2424	114.82	71.1905	112.5064	108.8519	-9.3264	117.7687	399.1523	2525.5494
0.229	70.7843	76.2502	114.8127	71.1926	112.5123	109.9889	-10.0228	118.752	400.6031	2526.1286
0.229	70.774	76.2528	114.7704	71.219	112.4518	111.5468	-9.8362	119.5315	399.6673	2524.3231
0.2291	70.7662	76.2493	114.728	71.2308	112.4779	109.3856	-9.3391	118.8651	398.797	2526.7726
0.2292	70.7919	76.2273	114.8017	71.2127	112.4681	110.1812	-9.9622	119.1582	400.2985	2527.0001
0.2292	70.7772	76.2578	114.7675	71.1977	112.4742	111.4328	-10.0139	118.4586	399.4484	2525.7223
0.2293	70.7944	76.263	114.7506	71.2423	112.4671	109.7446	-9.1915	119.3652	399.7393	2525.5815
0.2294	70.7965	76.2345	114.7219	71.2002	112.4308	110.6308	-9.9887	118.8737	398.0836	2527.2406
0.2294	70.7828	76.2463	114.7356	71.1823	112.4424	111.7856	-9.8513	118.3917	399.3531	2530.1075
0.2295	70.7965	76.2625	114.7569	71.2129	112.4909	109.779	-9.5045	119.2802	400.3484	2526.391
0.2296	70.7757	76.2539	114.7169	71.195	112.4284	111.5936	-10.107	118.6283	398.8764	2526.7802
0.2297	70.7765	76.2522	114.693	71.2342	112.383	111.7127	-9.7091	119.9079	399.5597	2526.7649
0.2297	70.813	76.251	114.7045	71.2029	112.3809	110.5398	-9.4232	119.3171	399.1689	2526.8398
0.2298	70.7845	76.2407	114.7672	71.1901	112.4692	112.0663	-10.2872	119.7524	400.0946	2525.6686
0.2299	70.7717	76.2429	114.6825	71.1882	112.3939	111.1863	-9.6151	119.4169	400.1767	2525.7258
0.2299	70.796	76.2473	114.635	71.2239	112.3513	111.4177	-9.1802	118.6354	398.4262	2527.0792
0.23	70.7936	76.24	114.6552	71.2053	112.3499	111.8104	-10.1743	119.2787	400.0311	2526.2819
0.2301	70.8045	76.2534	114.6427	71.2195	112.3422	110.5922	-9.1867	119.9115	399.994	2527.6312
0.2301	70.7942	76.2449	114.5989	71.2357	112.2877	112.6076	-10.0162	120.6032	398.9641	2526.7917
0.2302	70.8133	76.2487	114.6059	71.23	112.3072	111.5059	-9.6662	119.051	400.2819	2529.4607
0.2303	70.7765	76.2656	114.5819	71.2055	112.2832	112.289	-10.5674	118.3748	399.6451	2525.7177
0.2304	70.8138	76.2578	114.5354	71.2249	112.3044	111.0863	-9.1619	119.809	399.4114	2526.5273
0.2305	70.795	76.2561	114.5006	71.2334	112.2935	109.6228	-9.9856	118.4551	399.4008	2525.5996
0.2306	70.8136	76.2795	114.4811	71.2746	112.2548	111.7473	-9.6428	119.816	399.5438	2527.4702
0.2307	70.8077	76.261	114.4754	71.2145	112.3045	110.2509	-9.5506	119.7384	398.3107	2525.4292
0.2308	70.8011	76.2524	114.447	71.2051	112.3161	113.0855	-9.5175	119.3742	399.7556	2525.9676
0.2308	70.8107	76.2863	114.5174	71.1943	112.2911	110.8917	-10.0425	119.2257	399.1889	2524.9863
0.2309	70.8049	76.2913	114.4521	71.2163	112.2611	112.3624	-10.058	119.258	399.623	2526.6795
0.231	70.8115	76.2546	114.509	71.1951	112.2955	110.1441	-9.6438	119.6608	400.2598	2525.0926
0.2311	70.8053	76.259	114.4704	71.2099	112.2585	110.2155	-9.4347	119.8054	399.1307	2525.1626
0.2312	70.8291	76.2518	114.4322	71.1755	112.2036	112.3828	-10.408	119.6867	398.9641	2525.4693
0.2312	70.8131	76.2741	114.4221	71.2217	112.2293	109.9827	-8.9991	120.5089	399.6391	2527.6772
0.2313	70.8194	76.261	114.4662	71.2324	112.2231	110.5478	-10.262	119.7559	400.5925	2526.0519
0.2314	70.8059	76.2719	114.407	71.2417	112.2235	111.5728	-9.507	119.9121	398.7038	2524.9723
0.2315	70.8302	76.2859	114.3955	71.2275	112.1769	112.7265	-10.7412	119.9121	398.4934	2524.4674
0.2316	70.7965	76.2551	114.3354	71.2578	112.1809	111.2027	-9.0728	119.4802	399.7027	2525.8909
0.2317	70.8182	76.2719	114.257	71.2732	112.1384	110.2484	-10.0334	119.5615	399.5703	2525.7529
0.2318	70.8353	76.2554	114.2758	71.2485	112.1223	111.8998	-9.9703	119.8456	398.6706	2526.6395
0.2319	70.8294	76.2597	114.3605	71.2224	112.1995	110.3893	-9.5835	119.5352	400.221	2526.6234
0.2319	70.8248	76.2736	114.3377	71.2285	112.176	111.0685	-9.7532	119.4343	399.1412	2528.0069
0.2321	70.7935	76.2619	114.3648	71.1901	112.1504	110.7371	-9.4934	119.9892	398.7917	2524.5493
0.2322	70.8116	76.2629	114.3794	71.1952	112.1674	112.1392	-10.1989	120.1165	399.2048	2527.4472
0.2322	70.8018	76.278	114.3733	71.1946	112.1872	111.125	-9.8678	119.4908	398.8755	2525.878
0.2323	70.8226	76.2593	114.3191	71.2192	112.167	111.264	-9.5973	119.9892	399.369	2527.3169
0.2324	70.8092	76.26	114.3225	71.2168	112.1539	112.6903	-10.3897	118.8884	399.4679	2526.0143
0.2324	70.7967	76.2653	114.2889	71.2311	112.0977	111.0507	-9.4019	119.391	399.4126	2527.1765
0.2325	70.8388	76.236	114.3212	71.2078	112.1301	111.3034	-10.4545	120.241	399.8002	2526.9681
0.2326	70.824	76.2875	114.2798	71.2168	112.0887	111.0777	-8.8321	120.8767	397.3195	2524.9162
0.2327	70.808	76.2689	114.2851	71.2171	112.109	112.0837	-10.3525	120.3778	398.3605	2526.1826
0.2328	70.8266	76.2569	114.2538	71.2234	112.0652	112.7275	-9.0074	120.9949	399.2243	2526.7597
0.2328	70.8302	76.2839	114.1998	71.2588	112.026	111.5741	-8.2776	119.816	398.8976	2524.3883

0.2329	70.8331	76.2746	114.2654	71.1865	112.0725	112.6386	-10.9158	119.5156	399.1783	2526.9412
0.233	70.805	76.2661	114.1794	71.2698	112.0368	113.4374	-8.6033	119.3671	399.2207	2525.5996
0.2331	70.8335	76.2918	114.2	71.2401	112.0464	111.8663	-9.9229	120.2004	398.4325	2525.5414
0.2331	70.8173	76.2929	114.2821	71.2109	112.0701	112.858	-9.8746	121.1628	399.2472	2526.3049
0.2332	70.8314	76.2643	114.1867	71.2393	112.0156	113.1483	-10.22	120.3371	398.0504	2526.8639
0.2333	70.8294	76.2699	114.2054	71.2226	112.0719	112.3642	-10.693	119.6941	398.1501	2525.3971
0.2333	70.8088	76.3034	114.1197	71.2676	112.0299	113.616	-9.3985	119.9892	399.512	2526.2513
0.2334	70.8151	76.3029	114.1804	71.2219	112.0378	113.0597	-10.3519	119.809	397.9919	2526.4199
0.2335	70.8269	76.275	114.1519	71.2446	112.0434	113.1223	-9.8415	121.0947	398.1612	2525.0204
0.2335	70.8337	76.264	114.1048	71.2349	111.9988	113.675	-10.1199	120.0895	398.8588	2528.3146
0.2336	70.8185	76.2844	114.082	71.2267	111.9801	113.4925	-9.7191	119.9822	398.5586	2526.2359
0.2338	70.8087	76.2917	114.1053	71.2138	112.0106	113.3085	-10.4452	120.3463	398.3468	2526.1056
0.2338	70.8041	76.2846	114.1132	71.2072	111.4506	111.4506	-8.948	120.7068	398.691	2527.3706
0.2339	70.8146	76.3061	114.1563	71.216	112.0065	113.3183	-10.2792	120.9395	399.4513	2525.6937
0.234	70.785	76.2753	114.109	71.2224	111.9759	113.5227	-9.8562	119.7878	398.6063	2526.1976
0.234	70.8248	76.2857	114.1411	71.2005	111.995	111.5003	-10.0637	121.4938	397.7403	2526.2307
0.2341	70.8202	76.2812	114.1348	71.2048	112.0042	113.6018	-10.696	121.9829	398.5163	2526.4353
0.2342	70.7906	76.2688	114.0586	71.2395	111.9351	112.9487	-9.485	119.3706	398.9082	2526.5886
0.2342	70.8077	76.2883	114.1133	71.2048	111.997	111.7056	-10.1821	120.5336	397.3192	2527.2249
0.2343	70.8332	76.3043	114.119	71.1882	112.0556	113.8078	-9.827	122.0001	399.1579	2526.5513
0.2344	70.8062	76.2722	114.091	71.1928	111.9975	112.6792	-9.933	121.3423	398.0947	2526.912
0.2344	70.8394	76.2926	114.0569	71.2065	111.9809	112.001	-9.7603	120.1302	398.5432	2525.6376
0.2345	70.7926	76.2927	114.0514	71.2224	111.9639	113.1335	-9.3565	121.1169	398.7864	2526.2283
0.2346	70.7887	76.3131	114.0605	71.2194	111.9778	111.6194	-10.4538	120.9189	399.4484	2527.4856
0.2347	70.8165	76.3117	114.0076	71.2339	111.968	112.4351	-9.2798	121.2371	398.7546	2528.6279
0.2347	70.8294	76.2877	113.9868	71.2372	111.9183	112.5212	-9.5554	120.5182	397.9175	2526.2547
0.2348	70.8136	76.2745	114.0134	71.2286	111.9549	111.9211	-10.1057	120.241	397.7514	2525.854
0.2349	70.8177	76.2837	114.0093	71.2627	111.8882	113.5254	-10.0109	120.5034	398.8533	2524.9082
0.2349	70.7924	76.3068	114.0825	71.2199	111.9389	111.6954	-10.2684	121.1095	398.0726	2526.8398
0.235	70.7897	76.2727	113.9918	71.2397	111.8779	112.6128	-9.8245	120.523	397.7377	2527.2402
0.2351	70.8286	76.2895	114.0101	71.2277	111.8965	111.6759	-9.6208	120.9838	397.7348	2526.2948
0.2352	70.8013	76.3259	114.0212	71.2186	111.8675	113.3136	-10.2199	120.3297	397.696	2528.539
0.2353	70.7995	76.3242	113.9412	71.2469	111.805	114.4776	-9.9995	120.9691	398.4657	2526.6074
0.2353	70.8116	76.2922	113.9795	71.2663	111.8105	111.9082	-9.7393	121.5163	398.4898	2526.6192
0.2354	70.7889	76.2963	113.8666	71.2482	111.8167	114.1367	-10.1471	121.3361	398.7864	2523.269
0.2355	70.8161	76.3112	113.9165	71.2753	111.8361	114.6351	-10.0348	119.8585	397.7589	2527.1559
0.2356	70.823	76.3119	113.8913	71.2624	111.8027	112.2658	-10.0462	120.6254	399.0416	2525.9261
0.2356	70.797	76.3216	113.9284	71.2415	111.7997	113.9499	-10.1048	120.7178	397.1368	2521.9988
0.2357	70.8	76.2992	113.8575	71.2791	111.7714	114.6494	-10.0484	121.6121	397.8012	2525.325
0.2358	70.8465	76.3073	113.8545	71.276	111.7484	113.1018	-10.1383	120.9099	399.3793	2526.952
0.2358	70.8131	76.318	113.8205	71.2996	111.7329	114.1402	-9.8848	121.9935	398.029	2525.6226
0.2359	70.7852	76.2972	113.8655	71.2617	111.7719	113.4307	-9.9637	119.7976	397.6517	2528.4989
0.236	70.8059	76.3127	113.8645	71.299	111.7208	114.5277	-10.1506	121.5123	398.4103	2526.2708
0.2361	70.8138	76.2797	113.8202	71.2969	111.7302	113.8914	-10.0367	121.7001	397.5417	2525.7529
0.2362	70.8104	76.2861	113.7977	71.2959	111.7077	114.7791	-9.9527	122.1986	398.4898	2526.9489
0.2364	70.81	76.2989	113.7876	71.3279	111.6664	114.185	-9.7417	121.9632	398.8644	2526.0383
0.2365	70.809	76.2944	113.8068	71.2905	111.6712	113.9936	-10.1325	119.6004	397.9072	2524.534
0.2365	70.8169	76.3007	113.7927	71.2794	111.6514	113.1297	-9.7033	121.9262	398.3217	2525.9181
0.2366	70.8197	76.3112	113.7774	71.2791	111.6336	113.7493	-9.829	120.6882	398.1944	2527.0242
0.2367	70.7877	76.2829	113.7982	71.2915	111.6362	113.2739	-9.9246	121.7885	398.1932	2526.6269
0.2367	70.8014	76.3258	113.7884	71.2766	111.6384	113.7359	-10.1095	121.6224	398.9135	2527.6926
0.2368	70.7878	76.2946	113.7889	71.2832	111.605	113.2495	-9.421	121.9447	397.7735	2526.6956
0.2369	70.786	76.3158	113.7976	71.3151	111.6338	113.7316	-10.1557	121.4458	399.2741	2527.8898

0.2369	70.7679	76.3143	113.8061	71.2801	111.6322	113.743	-10.0276	121.4421	398.4209	2525.2623
0.2371	70.7916	76.3112	113.7867	71.2725	111.6415	114.373	-10.0919	122.3965	398.7334	2526.4276
0.2372	70.7726	76.3433	113.7529	71.2967	111.6149	114.2229	-10.0893	122.1455	396.8373	2526.3816
0.2372	70.8098	76.3165	113.7435	71.2701	111.6198	114.0438	-9.9679	121.4864	398.8367	2525.2849
0.2373	70.7875	76.3241	113.8404	71.2564	111.6544	113.7857	-9.8038	122.0713	398.2673	2526.9182
0.2374	70.8052	76.3329	113.7929	71.2924	111.6166	115.034	-10.177	121.6897	401.1568	2526.6475
0.2375	70.7936	76.3131	113.8312	71.2373	111.6453	114.0043	-10.0207	121.4032	397.9707	2526.0443
0.2376	70.796	76.3326	113.8253	71.2435	111.6322	114.5427	-10.2496	122.0006	398.3415	2524.5953
0.2377	70.7916	76.329	113.8044	71.2887	111.6305	114.2807	-10.0436	121.3386	398.1612	2526.7917
0.2378	70.8009	76.3229	113.7534	71.2751	111.6513	114.8955	-9.9508	121.8628	397.9283	2524.9096
0.238	70.798	76.3151	113.745	71.2299	111.6357	113.337	-9.5894	122.337	396.7843	2524.879
0.2381	70.7937	76.3259	113.7183	71.2673	111.6546	113.6657	-9.8556	121.808	397.9729	2527.6574
0.2381	70.8082	76.3375	113.7385	71.2233	111.6796	112.906	-10.1271	122.2481	396.9326	2527.1252
0.2382	70.787	76.3346	113.7218	71.2479	111.6782	114.9421	-9.7726	122.3549	398.211	2526.4471
0.2383	70.7891	76.3367	113.7312	71.2448	111.6726	113.1743	-9.6101	122.8169	396.8876	2527.1684
0.2383	70.7848	76.3214	113.6683	71.2348	111.6597	113.7315	-10.2506	121.5729	398.6434	2525.0706
0.2384	70.7958	76.3202	113.6494	71.2595	111.648	115.1274	-9.9409	121.382	398.405	2526.0596
0.2385	70.7891	76.3316	113.6889	71.2246	111.6328	113.1975	-9.9611	122.451	397.7126	2525.5815
0.2386	70.8229	76.3277	113.7061	71.2172	111.6304	113.8434	-9.573	121.7249	398.3309	2526.0903
0.2386	70.7948	76.3314	113.6686	71.2498	111.6432	114.3597	-10.061	121.4032	398.8182	2526.5043
0.2387	70.8073	76.3316	113.6326	71.2253	111.6024	114.9826	-10.2077	121.435	398.0766	2526.9949
0.2388	70.8036	76.3499	113.622	71.2439	111.6206	114.692	-9.6214	122.849	397.8913	2526.1593
0.2389	70.8006	76.3328	113.6561	71.2449	111.6526	114.5528	-10.1318	122.8464	398.9308	2528.7875
0.239	70.8075	76.3397	113.6426	71.2489	111.6065	114.4581	-9.7496	122.499	397.0094	2526.3429
0.2391	70.8172	76.3519	113.622	71.2408	111.5709	113.9537	-9.3358	122.2071	397.1146	2525.5574
0.2392	70.7972	76.3606	113.6151	71.2124	111.6496	113.584	-9.9286	122.4778	397.6476	2524.856
0.2392	70.7823	76.319	113.6779	71.2397	111.6261	115.274	-9.9427	123.2343	397.9601	2528.3749
0.2393	70.7929	76.3609	113.634	71.2709	111.613	113.6183	-9.4525	122.3364	398.0947	2526.8959
0.2394	70.8006	76.3405	113.5894	71.2611	111.4681	114.537	-9.9936	121.9964	396.6439	2525.7738
0.2394	70.8146	76.3188	113.6616	71.2556	111.5253	115.3545	-10.0831	121.2241	397.7791	2525.3571
0.2395	70.8099	76.3563	113.652	71.2524	111.4587	113.8035	-8.961	122.6652	396.4771	2525.1703
0.2396	70.8004	76.3516	113.6043	71.304	111.3847	114.413	-10.1381	123.662	397.5576	2524.7333
0.2397	70.8146	76.3585	113.6213	71.2944	111.4064	115.3167	-10.4552	122.0148	397.4252	2524.0663
0.2397	70.7901	76.3632	113.625	71.2949	111.446	114.4404	-9.9755	123.5966	396.8433	2526.4471
0.2398	70.7932	76.3509	113.569	71.3067	111.3975	115.7605	-8.9971	123.1716	397.0759	2526.6956
0.2399	70.8039	76.3285	113.595	71.2821	111.4361	114.8807	-10.3744	122.6506	398.1113	2524.3071
0.2399	70.8138	76.3588	113.5962	71.2988	111.4398	115.9026	-9.4767	123.4858	397.5853	2526.3269
0.24	70.8017	76.3382	113.536	71.2905	111.4027	115.6081	-10.0399	122.5485	397.1762	2526.8722
0.2401	70.8102	76.3638	113.5804	71.3284	111.4255	113.3352	-9.8307	123.1459	396.9962	2526.9642
0.2401	70.7998	76.3524	113.5159	71.3241	111.3644	116.0178	-9.15	123.7518	397.314	2525.2128
0.2402	70.8128	76.3425	113.5536	71.3243	111.4022	115.0563	-10.0447	122.9795	397.3693	2526.2067
0.2403	70.7944	76.3802	113.5877	71.3029	111.3762	115.5133	-10.0789	121.9225	397.1423	2527.2807
0.2403	70.7823	76.3385	113.5588	71.3333	111.3799	116.1848	-8.4212	124.0791	397.1127	2525.5306
0.2404	70.7833	76.3492	113.5202	71.3184	111.3916	114.8351	-10.2011	122.902	397.314	2525.1089
0.2405	70.7758	76.3709	113.5837	71.2707	111.3904	113.9012	-9.7103	122.4602	397.8595	2527.4932
0.2406	70.8067	76.344	113.515	71.2849	111.3987	115.7177	-8.299	123.9884	396.3449	2525.7097
0.2406	70.8048	76.3609	113.573	71.2574	111.4276	114.0469	-10.5929	123.2449	397.6953	2525.5919
0.2407	70.7947	76.3372	113.476	71.2936	111.3496	114.6411	-9.3043	123.1975	396.954	2526.2467
0.2408	70.8029	76.3516	113.5554	71.2932	111.3981	114.0212	-10.8098	122.9091	397.7536	2525.0399
0.2409	70.8016	76.3568	113.4542	71.3353	111.3403	114.982	-9.4016	122.8834	397.1921	2525.4292
0.241	70.8012	76.3402	113.4931	71.2859	111.3549	114.3241	-10.5697	123.1601	397.9919	2527.5162
0.241	70.8154	76.3476	113.5065	71.3299	111.3701	114.2602	-9.383	123.519	397.1201	2523.5617
0.2411	70.7998	76.3652	113.4412	71.3195	111.3073	115.2003	-10.6265	122.8316	397.541	2525.0926

0.2412	70.7953	76.3758	113.465	71.3257	111.3412	114.604	-9.5231	123.807	397.2133	2526.1746
0.2413	70.8109	76.3767	113.4994	71.2972	111.3348	115.3851	-10.7057	123.3757	397.8754	2527.8536
0.2414	70.8092	76.367	113.4763	71.2735	111.3374	115.3229	-9.9051	123.2825	398.2996	2526.5433
0.2415	70.7911	76.382	113.4401	71.3031	111.3037	115.1975	-10.2173	123.7999	397.7071	2525.5815
0.2416	70.7939	76.3797	113.429	71.3071	111.3377	115.3787	-9.7057	123.0977	396.9873	2524.5636
0.2417	70.8034	76.3891	113.468	71.3187	111.3466	115.1409	-10.4608	123.5597	397.4358	2526.8318
0.2418	70.798	76.3634	113.4382	71.2934	111.3067	115.7094	-9.9696	122.8612	397.6739	2525.0926
0.2419	70.8118	76.3746	113.4116	71.3071	111.2676	115.2505	-10.3569	124.199	396.9485	2525.1407
0.2419	70.8141	76.3769	113.3948	71.3028	111.2959	114.8259	-10.085	122.9832	396.8045	2527.8978
0.2421	70.8207	76.3621	113.3965	71.3194	111.2991	115.633	-9.8154	123.6125	396.5195	2526.8722
0.2422	70.8139	76.3504	113.4148	71.2916	111.303	115.115	-9.5844	123.1601	396.9485	2525.4999
0.2423	70.7932	76.3688	113.4419	71.2895	111.2904	115.4948	-9.8439	123.3305	396.6827	2526.5513
0.2424	70.8095	76.3851	113.4091	71.2944	111.2676	115.8868	-9.813	123.7518	397.2697	2525.3971
0.2425	70.8012	76.3719	113.5199	71.2741	111.341	115.8969	-9.7764	122.7712	396.2652	2524.005
0.2426	70.7992	76.3821	113.4769	71.306	111.2955	116.1217	-9.9703	123.9377	397.0279	2524.4496
0.2426	70.8044	76.3698	113.4898	71.2745	111.3157	115.3861	-9.6987	122.6062	397.1921	2525.333
0.2427	70.7978	76.409	113.4545	71.2972	111.3055	116.0113	-10.0278	124.2581	396.9374	2525.5735
0.2429	70.8124	76.4074	113.3465	71.2977	111.2658	116.4194	-9.9261	123.556	397.5576	2528.1985
0.243	70.8036	76.3894	113.3811	71.3169	111.2747	115.9453	-10.0133	123.2345	396.8101	2526.6715
0.2431	70.8026	76.368	113.3024	71.3338	111.2335	117.2691	-10.3013	123.5486	397.0316	2526.3108
0.2432	70.8008	76.3739	113.3224	71.298	111.2185	115.7344	-9.657	123.4562	398.0006	2527.0643
0.2433	70.7957	76.3891	113.2911	71.3376	111.2423	116.7238	-10.2761	123.9921	398.0172	2526.0303
0.2434	70.7942	76.3927	113.3522	71.2977	111.2909	116.0726	-10.0238	124.2544	397.0759	2526.3189
0.2434	70.7965	76.3823	113.359	71.3072	111.2476	117.3536	-10.322	124.029	395.9463	2523.8502
0.2435	70.8095	76.3978	113.3623	71.2926	111.2233	116.3996	-9.8953	124.0734	397.9175	2528.0421
0.2436	70.8092	76.4067	113.2815	71.3072	111.1984	114.692	-9.7205	123.9943	399.1783	2525.7836
0.2437	70.8119	76.4045	113.2787	71.3043	111.2003	117.148	-10.5976	124.7579	396.6625	2528.6432
0.2437	70.8036	76.3743	113.2856	71.304	111.1929	116.6051	-9.8797	123.4075	396.8214	2525.3389
0.2439	70.7944	76.4031	113.3165	71.3021	111.205	117.2161	-10.3318	122.7799	395.4645	2523.6739
0.244	70.7992	76.3723	113.3424	71.2984	111.2329	116.0995	-9.8416	123.9024	397.0597	2524.6566
0.244	70.8021	76.4108	113.355	71.3057	111.2385	114.8343	-10.0486	123.3453	398.0338	2524.251
0.2441	70.8197	76.4258	113.3252	71.288	111.2137	116.7061	-10.1348	124.0992	396.2231	2527.4971
0.2442	70.8162	76.4197	113.2853	71.301	111.1939	116.2314	-10.1905	124.6536	397.3361	2527.5692
0.2444	70.7975	76.4072	113.2486	71.342	111.2014	117.6687	-10.0859	122.8702	397.261	2527.6696
0.2446	70.7953	76.4123	113.195	71.302	111.1478	117.0849	-10.283	123.3085	397.1021	2522.7783
0.2447	70.8195	76.4218	113.1545	71.273	111.2631	116.693	-10.0741	123.7751	396.8267	2526.1439
0.2447	70.7911	76.3947	113.1887	71.2639	111.3279	116.3132	-10.3272	124.4466	397.5022	2524.9643
0.2448	70.7987	76.4084	113.1996	71.2603	111.3106	116.6744	-10.1214	124.9947	396.6731	2526.3509
0.245	70.7833	76.4101	113.1743	71.2638	111.2901	116.8201	-10.3724	125.0442	396.636	2526.9872
0.2451	70.7993	76.4054	113.2079	71.2477	111.312	116.9226	-9.8404	124.2249	397.3583	2526.2547
0.2451	70.8002	76.3977	113.1109	71.2876	111.2919	116.4451	-10.3086	124.2453	397.2504	2525.1473
0.2452	70.8065	76.4024	113.1483	71.2941	111.2649	116.8557	-10.1046	123.4747	396.2563	2527.1043
0.2453	70.7916	76.4111	113.129	71.3105	111.2304	117.0005	-9.8096	123.9872	396.8002	2527.3782
0.2455	70.7848	76.4335	113.1243	71.2397	111.3312	117.0049	-10.029	124.4538	397.3934	2526.5426
0.2456	70.8139	76.4276	113.1111	71.2716	111.3129	116.6764	-10.4273	125.1155	398.294	2527.5291
0.2456	70.8175	76.4077	113.0977	71.2614	111.307	117.2199	-9.746	124.2276	396.5195	2525.8526
0.2457	70.7998	76.4009	113.149	71.231	111.2957	117.1427	-10.1397	123.4525	397.2198	2526.3028
0.2458	70.8098	76.4108	113.1215	71.2592	111.3158	117.0675	-10.0872	124.8679	396.5775	2526.8799
0.2458	70.8276	76.4226	113.1465	71.2452	111.3151	116.9356	-9.9335	124.574	395.9051	2525.4156
0.2459	70.808	76.425	113.1432	71.2175	111.307	117.0849	-10.0599	124.9169	395.8045	2528.4975
0.246	70.7955	76.4144	113.1474	71.232	111.3092	117.8357	-9.8316	124.3357	397.8566	2527.2646
0.2461	70.797	76.4165	113.1128	71.2377	111.3101	116.3705	-10.281	124.0721	398.0396	2526.5119
0.2462	70.8227	76.4152	113.0979	71.2446	111.3144	117.2484	-9.7286	124.7296	397.2398	2525.0476

0.2463	70.8062	76.4429	113.0325	71.2783	111.2568	117.2783	-10.2956	123.8923	397.5908	2527.8016
0.2464	70.8087	76.4098	113.0671	71.2829	111.2438	117.636	-9.8674	125.2929	396.8488	2526.6555
0.2465	70.8082	76.4042	113.0174	71.2834	111.2192	116.4637	-10.0462	124.4503	396.9485	2526.1425
0.2466	70.7952	76.4065	113.0094	71.2957	111.2413	117.3257	-9.6524	124.5168	396.4889	2524.0987
0.2467	70.8075	76.4318	113.0157	71.2805	111.2489	116.6744	-10.0453	124.2806	396.0481	2526.1133
0.2467	70.7919	76.4159	113.0495	71.2496	111.2713	116.6253	-9.94	124.5205	396.2397	2524.7399
0.2468	70.8012	76.4547	113.0265	71.2671	111.2646	117.4714	-9.9246	125.6204	396.8214	2525.7606
0.2469	70.8067	76.4332	113.0693	71.2647	111.2435	116.3262	-9.7775	124.879	395.9186	2525.9181
0.247	70.7977	76.4123	113.0235	71.2689	111.2352	117.1986	-9.7636	124.5104	397.1392	2525.9063
0.2471	70.7931	76.4345	113.0524	71.2153	111.2809	115.9618	-10.239	124.065	396.5142	2527.4549
0.2472	70.7945	76.449	113.0456	71.2584	111.2348	116.9746	-9.7762	124.9751	396.3671	2526.936
0.2473	70.8012	76.462	113.0231	71.2636	111.2012	116.4354	-10.2086	125.6593	396.0534	2526.6882
0.2474	70.796	76.4684	112.9996	71.2346	111.1914	117.008	-10.6065	124.661	396.0958	2526.7837
0.2474	70.7799	76.4523	113.0166	71.2443	111.1908	116.3076	-9.965	125.3446	395.7857	2525.7258
0.2475	70.7868	76.455	112.9774	71.2586	111.1819	116.4274	-10.3039	125.3199	396.2017	2524.1276
0.2476	70.8141	76.4508	112.942	71.2269	111.2089	117.3443	-10.4655	125.9655	396.356	2525.6616
0.2477	70.7679	76.4327	112.9501	71.2479	111.1869	117.3304	-10.0001	126.2316	395.7414	2528.7314
0.2478	70.776	76.4394	112.8898	71.2743	111.1638	116.55	-10.0026	125.228	397.1762	2522.027
0.2479	70.8149	76.4489	112.8829	71.3787	111.1607	116.7312	-10.0367	124.1569	397.2133	2470.5005
0.248	70.8	76.4413	112.618	71.3834	111.1317	117.9166	-10.1849	125.2916	397.118	2433.203
0.2481	70.8271	76.4294	112.6599	71.3919	111.1617	118.0587	-10.4812	125.8254	396.4453	2383.9457
0.2482	70.8274	76.4615	112.4219	71.4606	111.0422	118.668	-10.0833	125.5073	396.6495	2305.9551
0.2483	70.81	76.434	112.3076	71.5791	110.9554	118.9662	-10.1708	125.5146	395.5753	2241.5308
0.2483	70.8002	76.4464	112.3634	71.5319	110.9849	118.8487	-10.7275	125.5073	395.6826	2166.0562
0.2484	70.81	76.4196	112.3006	71.5534	110.9485	119.0361	-10.232	124.6094	396.1911	2163.8253
0.2486	70.8284	76.4447	112.2077	71.6152	110.9031	119.5821	-9.5491	125.8029	396.057	2086.8258
0.2486	70.8366	76.4243	112.1836	71.6369	110.8938	119.8314	-9.7989	125.337	396.1328	2048.3219
0.2487	70.8134	76.4347	112.1552	71.6511	110.8681	119.2672	-9.7038	126.542	396.6163	2041.3569
0.2488	70.8175	76.4564	112.0807	71.7031	110.8245	119.4644	-9.9901	125.7936	397.314	1962.9708
0.249	70.8427	76.4498	112.0946	71.7148	110.8192	119.7808	-10.2596	125.5532	395.9263	1916.4275
0.249	70.8146	76.4233	112.0622	71.7249	110.8102	119.7772	-10.0282	127.6766	396.9762	1902.4254
0.2491	70.8266	76.4582	111.9831	71.7516	110.7261	119.7865	-10.1353	125.4296	395.4091	1864.0257
0.2492	70.8453	76.4284	112.0018	71.7681	110.7398	119.7596	-10.1328	125.7844	396.9873	1818.3083
0.2493	70.839	76.4291	111.9829	71.7769	110.7386	120.2908	-10.4449	125.2315	396.8585	1781.8883
0.2494	70.8488	76.437	111.9154	71.7796	110.7236	120.1832	-10.4233	125.5775	396.4446	1735.3694
0.2496	70.8473	76.4508	111.8386	71.8649	110.6819	120.5557	-10.6247	125.012	397.0094	1569.9887
0.2497	70.8305	76.4425	111.851	71.8526	110.6667	120.3725	-10.6451	125.1573	396.1064	1565.149
0.2497	70.8274	76.4488	111.8369	71.8453	110.6752	120.7201	-10.7131	126.239	396.7104	1563.6969
0.2498	70.8554	76.4479	111.8147	71.8719	110.6592	120.0065	-10.4213	125.7724	395.5343	1559.9435
0.2499	70.8241	76.4556	111.8181	71.8644	110.6438	120.0262	-10.7575	126.5975	395.7524	1514.7495
0.2501	70.8371	76.4369	111.7735	71.8909	110.6204	120.3468	-10.9866	125.5956	395.7939	1511.3763
0.2502	70.8264	76.4426	111.8704	71.8437	110.6686	120.7721	-11.1017	126.5088	396.5221	1514.5412
0.2503	70.8342	76.4462	111.79	71.876	110.6129	120.6818	-11.0871	126.2248	395.9263	1513.4616
0.2506	70.8098	76.4541	111.7692	71.8784	110.6049	120.7061	-11.1333	126.0985	396.3172	1512.834
0.2509	70.8118	76.4536	111.7205	71.8799	110.6164	120.7619	-11.2838	125.6809	396.9319	1513.9561
0.251	70.8164	76.4506	111.7514	71.845	110.5746	120.8093	-11.2052	126.1466	395.8798	1513.3389
0.2514	70.7779	76.4605	111.703	71.8391	110.5337	121.1623	-11.314	126.7194	397.2475	1512.2008
0.2515	70.8041	76.4698	111.6666	71.8968	110.4774	120.7866	-11.3972	126.391	396.2017	1512.5186
0.2516	70.8093	76.4714	111.6568	71.8661	110.5076	120.9226	-11.3447	126.2685	397.4413	1513.4351
0.2517	70.8259	76.4523	111.619	71.8863	110.4898	120.9523	-11.4406	126.6307	395.171	1515.511
0.2519	70.8134	76.462	111.6708	71.845	110.5129	121.0132	-11.4448	126.5571	395.3913	1513.8679
0.2522	70.8183	76.4645	111.6284	71.8848	110.4537	121.4486	-12.2543	127.2535	395.7939	1511.7213
0.2522	70.806	76.463	111.5934	71.9113	110.4316	121.0378	-12.4577	127.0151	394.429	1514.7415

0.2523	70.8312	76.4676	111.5752	71.877	110.3764	121.2762	-13.1824	125.6027	396.6307	1514.8339
0.2524	70.7955	76.45	111.6729	71.8493	110.4484	121.5329	-14.3854	126.2057	395.6362	1515.3587
0.2525	70.8163	76.443	111.6546	71.87	110.4319	121.6485	-14.8418	126.4157	396.5195	1514.2666
0.2526	70.8413	76.463	111.6895	71.8762	110.4428	121.4708	-14.1224	127.356	395.8362	1514.3125
0.2527	70.8249	76.4662	111.631	71.907	110.3867	121.3144	-14.0913	126.4051	395.3913	1513.4462
0.2528	70.8256	76.4775	111.6049	71.8924	110.3729	121.0796	-13.7044	127.1333	395.8798	1513.4351
0.253	70.821	76.4818	111.644	71.8958	110.3709	121.5108	-13.6786	126.5112	395.4973	1512.5876
0.2531	70.834	76.486	111.6253	71.8697	110.3832	121.5812	-13.9984	126.7711	395.2984	1513.395
0.2531	70.8197	76.4903	111.5996	71.8726	110.2977	121.6778	-13.9883	125.7724	396.3924	1511.9666
0.2532	70.8402	76.4819	111.5844	71.9123	110.3198	121.5877	-14.0208	126.7268	395.3648	1513.6755
0.2534	70.8443	76.4732	111.6235	71.8935	110.3489	121.8413	-14.3634	126.6196	395.2098	1515.4308
0.2534	70.8178	76.4567	111.6624	71.8364	110.3558	121.5739	-14.1189	126.4122	394.8723	1513.2009
0.2536	70.8378	76.4669	111.6186	71.8553	110.3407	121.8857	-14.0662	127.4126	395.6614	1514.9029
0.2537	70.8395	76.4881	111.6231	71.8745	110.3284	121.4663	-14.1305	125.9279	396.4347	1514.6575
0.2537	70.8389	76.4806	111.5736	71.8886	110.2714	121.6128	-13.7897	126.8155	395.8798	1515.2385
0.2538	70.8745	76.4937	111.5638	71.8875	110.3051	121.6547	-13.6172	126.3839	395.635	1513.6532
0.2539	70.8371	76.4992	111.5906	71.906	110.2834	121.7651	-14.01	126.9448	394.7779	1512.5935
0.254	70.8461	76.4996	111.5883	71.8733	110.344	121.9088	-13.9577	127.3419	394.5386	1512.2656
0.2541	70.8512	76.4826	111.5648	71.9077	110.2801	121.6212	-13.8878	126.8783	396.0072	1512.9782
0.2542	70.8432	76.4798	111.5267	71.9226	110.2872	121.5924	-13.1562	126.2316	395.0824	1512.5534
0.2544	70.842	76.5066	111.5244	71.8743	110.2573	121.7401	-13.2187	127.3144	396.2453	1511.3512
0.2546	70.8351	76.5074	111.6154	71.8342	110.3107	121.8441	-13.4172	127.3809	395.5033	1512.6897
0.2547	70.8498	76.4764	111.5612	71.836	110.2546	121.708	-12.9517	126.4122	395.9369	1514.7419
0.2548	70.8339	76.4922	111.5356	71.8684	110.2457	121.6858	-13.4747	127.0061	396.1593	1513.8219
0.2549	70.8108	76.4908	111.4871	71.8822	110.2325	121.7698	-13.0166	128.0166	395.5919	1514.1164
0.255	70.8278	76.4788	111.4728	71.8875	110.2116	122.1452	-13.2857	128.5544	396.064	1513.5382
0.2551	70.8389	76.5112	111.4751	71.9109	110.2406	121.8107	-13.7252	127.0114	395.7192	1514.2526
0.2552	70.8573	76.4989	111.5184	71.8477	110.2412	121.8069	-13.1321	127.3255	395.0714	1515.0862
0.2553	70.8067	76.5071	111.4507	71.8682	110.2212	122.1692	-13.3681	126.9744	395.0381	1515.4468
0.2554	70.8266	76.5117	111.4256	71.9218	110.1861	121.9221	-13.0901	126.6861	393.8753	1513.6595
0.2555	70.8386	76.5033	111.4327	71.9034	110.163	121.8367	-12.7944	126.8229	395.3372	1516.2884
0.2558	70.8276	76.5152	111.4003	71.9066	110.1224	121.916	-12.4972	127.3454	395.6244	1516.6278
0.2559	70.8328	76.4847	111.4071	71.8927	110.1299	122.1516	-13.1344	127.7135	394.5509	1513.9961
0.256	70.808	76.5033	111.4495	71.8772	110.1272	122.19788	-13.014	126.7453	395.8909	1512.1767
0.2562	70.839	76.5071	111.4233	71.9006	110.131	122.2936	-13.5123	128.2574	396.0216	1516.4898
0.2563	70.8268	76.5315	111.4459	71.8822	110.1224	122.3327	-14.1354	127.3277	394.7346	1515.7462
0.2564	70.8376	76.5125	111.3969	71.8874	110.1046	122.4219	-14.4992	127.7283	395.3427	1513.0824
0.2565	70.8317	76.5242	111.3862	71.9044	110.1106	122.3558	-13.9944	127.6247	395.3701	1512.5876
0.2567	70.8173	76.5195	111.3958	71.8897	110.1346	122.3576	-13.658	127.2288	395.6297	1512.8789
0.2568	70.8268	76.5144	111.3938	71.8804	110.1255	122.5442	-13.9656	127.5646	394.5227	1512.8329
0.2569	70.832	76.5247	111.376	71.8866	110.1013	122.3773	-13.7386	127.8724	395.3538	1510.694
0.2571	70.8179	76.531	111.367	71.8851	110.0873	122.5334	-13.3398	128.0905	395.7026	1512.7859
0.2572	70.8386	76.531	111.3418	71.9349	110.0614	122.5735	-12.5192	129.2366	395.4284	1512.6719
0.2572	70.8203	76.5282	111.3253	71.909	110.0707	122.7294	-12.6771	128.0572	395.1489	1513.0023
0.2573	70.831	76.5527	111.3353	71.9014	110.0933	122.6064	-12.7811	127.9605	394.9835	1513.2086
0.2574	70.8259	76.5262	111.2719	71.9134	110.0123	122.7182	-12.5224	127.987	395.6528	1514.7255
0.2575	70.8268	76.5363	111.3343	71.8687	110.042	122.8418	-12.4866	128.3281	394.581	1511.6523
0.2576	70.8215	76.5359	111.2885	71.9002	110.0154	122.4651	-12.3448	127.7837	395.6456	1512.0433
0.2578	70.8092	76.5359	111.3274	71.8836	110.0446	122.5913	-12.734	128.0913	395.2218	1513.3696
0.2579	70.8535	76.513	111.2765	71.9027	110.0319	122.9207	-12.6604	128.242	395.5531	1511.776
0.258	70.8481	76.5356	111.295	71.9343	110.0228	122.865	-12.4199	127.4696	394.7945	1514.7415
0.2582	70.8445	76.5295	111.3022	71.9034	110.0426	122.8929	-12.554	127.4068	395.6085	1514.3167
0.2583	70.8471	76.5448	111.2827	71.9116	110.0331	122.5705	-12.2539	128.3307	395.459	1513.1546

0.2586	70.8683	76.5328	111.225	71.8988	109.9478	122.8176	-12.4715	128.194	395.3759	1512.1767
0.2586	70.8598	76.5652	111.2265	71.9361	109.9719	122.9449	-12.027	128.3381	395.5088	1514.3969
0.2588	70.8488	76.5364	111.1926	71.9368	109.9314	123.1537	-12.6441	127.1262	395.4337	1513.1166
0.2589	70.8425	76.5504	111.2338	71.9409	109.939	122.7173	-12.5467	128.9479	395.5974	1515.7915
0.259	70.8635	76.568	111.2096	71.9249	109.9436	122.6872	-12.3311	127.455	395.6085	1512.2119
0.2591	70.853	76.5303	111.1934	71.9254	109.9087	122.6764	-12.2828	128.8666	395.8466	1514.9098
0.2592	70.8708	76.5242	111.1907	71.9153	109.9127	123.255	-12.4067	128.0029	395.9686	1515.0025
0.2594	70.8491	76.5214	111.1887	71.9205	109.8939	123.2617	-12.2955	128.0166	394.7004	1510.4455
0.2596	70.8522	76.5446	111.1883	71.9056	109.8911	123.0826	-12.3958	128.724	394.8511	1515.9992
0.2599	70.8491	76.5545	111.2027	71.9272	109.8929	123.6054	-12.3653	127.4844	394.6616	1514.1324
0.26	70.8494	76.5547	111.163	71.9251	109.8683	123.0248	-12.3166	128.0498	395.0105	1513.5794
0.2603	70.8552	76.5719	111.1774	71.9238	109.8946	123.1066	-12.2279	128.8053	395.0841	1513.1012
0.2606	70.8476	76.5657	111.148	71.9251	109.8432	123.2858	-11.9913	128.4785	394.9329	1516.08
0.2607	70.8564	76.5683	111.1225	71.9339	109.8326	123.3323	-12.3436	128.3917	395.3754	1513.5766
0.2608	70.8508	76.5724	111.1043	71.9422	109.8215	123.1262	-12.1541	128.9785	395.3807	1510.5866
0.261	70.8438	76.5797	111.0943	71.9496	109.7895	123.6221	-12.3001	128.8555	394.9717	1512.1046
0.2611	70.8379	76.5458	111.1194	71.9547	109.797	123.3824	-11.9904	129.1659	394.3183	1514.3728
0.2613	70.8557	76.5651	111.0418	71.9738	109.735	123.351	-11.8317	127.6671	395.529	1513.5919
0.2614	70.8338	76.5519	111.0903	71.9276	109.7504	123.5496	-11.959	127.0742	394.6782	1513.403
0.2615	70.84	76.5787	111.1233	71.9126	109.7781	123.582	-11.965	128.7558	395.2801	1514.0749
0.2615	70.831	76.56	111.0755	71.9617	109.7615	123.5624	-12.0827	128.876	396.1011	1513.2776
0.2617	70.8405	76.5671	111.104	71.9175	109.7661	123.6477	-11.7925	129.2684	395.8045	1513.0169
0.2618	70.8444	76.588	110.9939	71.9544	109.7087	123.5998	-11.9432	129.1977	394.3108	1513.3619
0.2619	70.8649	76.5865	111.0453	71.9554	109.7337	123.654	-12.0439	129.1836	395.7197	1514.1592
0.262	70.8532	76.584	111.0452	71.9404	109.7354	123.8209	-12.2857	128.5598	395.5476	1515.527
0.2623	70.8234	76.5817	111.0174	71.9587	109.7322	123.8548	-12.0024	129.5724	394.7134	1513.3312
0.2624	70.8378	76.5668	111.0083	71.9666	109.6775	124.1018	-11.9328	128.2009	395.2589	1512.4189
0.2625	70.8686	76.5585	111.0321	71.9297	109.7349	123.6318	-12.1604	129.7633	395.6244	1513.6886
0.2626	70.8542	76.6002	110.9982	71.9734	109.7346	123.9676	-12.0437	129.6737	394.8034	1513.9292
0.2628	70.818	76.5763	111.0217	71.9583	109.7053	123.7526	-12.1945	128.922	395.5555	1514.5962
0.2628	70.8348	76.5733	110.9574	71.9992	109.6952	123.9927	-12.1253	129.9494	394.9994	1512.7859
0.2629	70.8507	76.6044	111.0139	71.9749	109.7015	123.9221	-12.0454	129.0292	394.861	1512.7378
0.263	70.8596	76.6006	110.9733	71.9592	109.6961	123.858	-12.0608	129.6205	394.7059	1512.7298
0.2631	70.8434	76.5822	110.9843	71.9886	109.6991	123.7633	-12.0112	129.7209	393.5746	1513.5536
0.2631	70.8403	76.596	110.9796	71.9666	109.7063	123.8885	-12.0105	129.1624	394.2155	1513.3619
0.2633	70.8315	76.6057	110.9775	71.943	109.6727	124.369	-11.8034	129.7018	395.016	1512.9782
0.2635	70.8171	76.5973	111.0088	71.9427	109.6828	124.0369	-12.0384	128.6038	394.3956	1513.9522
0.2636	70.8509	76.6047	110.9564	71.9853	109.644	124.3903	-12.0492	127.9427	394.8776	1511.1027
0.2636	70.8346	76.6087	110.987	71.9679	109.657	123.9528	-12.0362	128.922	395.5531	1513.4992
0.2638	70.854	76.6103	110.9725	71.9609	109.6702	124.3002	-12.0479	129.6389	395.0105	1515.4388
0.264	70.83	76.6169	110.9155	71.9743	109.6206	124.199	-12.0252	129.7128	394.9108	1512.4573
0.2641	70.8399	76.6115	110.9283	71.9721	109.636	124.316	-11.8851	130.0085	393.6926	1514.7736
0.2642	70.8394	76.6085	110.8974	71.9713	109.6101	124.3755	-11.7179	128.7076	394.8554	1512.4012
0.2643	70.8408	76.5917	110.9598	71.9832	109.6386	124.2369	-11.7092	130.792	397.8807	1514.3815
0.2644	70.8293	76.607	110.8819	71.9893	109.6134	124.0796	-11.7665	129.8835	394.5598	1514.4122
0.2644	70.8195	76.6143	110.879	71.984	109.5986	124.4679	-11.5913	130.1557	394.6604	1513.2162
0.2646	70.8249	76.622	110.9057	72.0027	109.5933	124.2073	-11.5608	129.5724	394.7945	1512.3851
0.2649	70.8198	76.6245	110.8609	71.9851	109.556	124.4145	-11.5996	129.9715	394.6173	1514.1484
0.265	70.8188	76.6112	110.8289	71.9548	109.5772	124.0432	-11.7296	129.5547	395.1318	1512.7639
0.2652	70.8271	76.6024	110.8928	71.9638	109.5812	124.3248	-12.034	129.5547	395.1	1512.3576
0.2653	70.8369	76.6085	110.9253	71.9563	109.6029	124.8214	-11.9006	130.1711	393.9805	1514.3728
0.2655	70.8615	76.5978	110.8545	71.9834	109.5452	124.2022	-12.0339	129.5441	394.724	1513.6456
0.2658	70.8116	76.6062	110.8713	71.9396	109.5639	124.5464	-12.1156	129.3913	395.315	1515.0541

0.2659	70.8262	76.6182	110.8458	71.9672	109.5434	124.5083	-11.929	130.6737	394.8665	1513.2908
0.266	70.8264	76.6431	110.7744	71.9995	109.5179	124.5363	-11.957	130.3854	393.76	1512.8483
0.2661	70.8295	76.6342	110.7861	71.9728	109.5289	124.6105	-12.0685	131.1578	395.1766	1515.4228
0.2662	70.8356	76.6021	110.8317	71.958	109.5244	124.591	-12.0136	129.1955	393.7369	1512.874
0.2664	70.8535	76.6214	110.7869	71.9805	109.5424	124.8748	-12.0945	129.3709	394.2791	1511.453
0.2666	70.8468	76.6108	110.7539	71.9809	109.5117	122.5139	-12.02	127.7468	393.6483	1512.2168
0.2667	70.8387	76.6536	110.752	71.9738	109.4897	121.5794	-11.9505	127.1038	394.7945	1512.4813
0.2668	70.8438	76.6357	110.7138	71.9835	109.4716	119.7856	-12.0161	125.7031	394.7779	1513.0744
0.2669	70.8596	76.6439	110.7665	71.9963	109.4767	117.8162	-11.7938	122.6801	394.8333	1513.0744
0.267	70.8359	76.6329	110.7394	71.9968	109.4696	116.6095	-11.7256	122.1073	394.1522	1514.6213
0.2671	70.8599	76.6492	110.7705	71.9978	109.423	115.4316	-11.6222	120.9986	395.0381	1513.5473
0.2672	70.8615	76.6148	110.7955	71.9673	109.4767	114.2175	-11.6392	120.4453	394.3055	1514.5042
0.2673	70.8514	76.6154	110.7211	71.9909	109.4262	112.9272	-11.7736	118.4634	395.0935	1512.7779
0.2675	70.8557	76.6284	110.75	71.9796	109.4647	112.1943	-11.7753	118.0627	394.0884	1513.8066
0.2677	70.8254	76.6378	110.761	71.983	109.4485	111.5756	-11.9487	116.9335	395.8023	1513.4511
0.2678	70.8415	76.6156	110.6975	72.0231	109.3851	111.5774	-11.9476	117.9498	395.5919	1514.0122
0.2679	70.8565	76.6485	110.685	72.0537	109.3525	111.9165	-11.8045	117.7687	394.1134	1514.453
0.268	70.8341	76.6566	110.6599	72.0231	109.3449	112.0187	-11.8748	117.1848	395.6196	1513.395
0.2681	70.8755	76.6238	110.6873	72.0061	109.3852	111.8424	-12.0841	117.3062	394.3956	1514.4659
0.2682	70.8479	76.6424	110.7128	71.9697	109.423	112.3875	-12.1135	117.9719	394.2519	1513.7156
0.2685	70.8468	76.6388	110.6586	72.0167	109.3562	112.2871	-12.3644	116.9815	394.1633	1512.6656
0.2685	70.8479	76.6499	110.6311	71.9978	109.3362	112.3365	-12.0219	118.2819	394.6392	1514.4505
0.2686	70.8264	76.626	110.6585	72.0281	109.3708	112.5613	-12.0303	118.4303	393.7547	1512.0126
0.2687	70.8088	76.6365	110.6135	72.0294	109.3261	112.1599	-12.0013	118.6852	395.243	1513.6755
0.2688	70.8063	76.6523	110.6462	72.0034	109.3538	112.5328	-11.8463	118.5894	394.4327	1513.1626
0.269	70.8156	76.6494	110.6614	72.0237	109.3641	112.8714	-12.0894	117.6845	394.3638	1514.1056
0.2692	70.8277	76.6452	110.6413	72.0144	109.3665	112.6838	-12.1051	118.4708	395.1212	1514.2045
0.2693	70.8113	76.6569	110.6657	71.9779	109.3407	112.6745	-12.144	117.6652	394.3294	1513.5874
0.2694	70.8107	76.647	110.6074	72.0029	109.279	113.2268	-12.2068	118.2066	395.1212	1512.5493
0.2694	70.8186	76.6621	110.6201	72.0061	109.3324	113.1735	-12.2163	118.4622	395.3066	1513.3236
0.2695	70.8351	76.6551	110.5784	72.0499	109.276	113.2105	-12.3545	118.8884	393.46	1514.2286
0.2696	70.8162	76.6439	110.5982	72.0062	109.2957	113.4585	-12.1172	119.4206	394.3847	1514.1404
0.2698	70.8433	76.6429	110.5573	72.0412	109.2624	113.1594	-12.0375	118.881	394.5066	1511.784
0.2701	70.8433	76.6302	110.5618	72.0381	109.2794	113.3322	-12.0946	119.1176	393.4766	1513.371
0.2702	70.8437	76.6579	110.599	72.0188	109.2825	113.3387	-12.0455	119.4272	394.0672	1513.6226
0.2703	70.8601	76.6524	110.5721	72.0085	109.294	113.4463	-11.9839	120.5937	394.0354	1512.6949
0.2704	70.8652	76.6551	110.5302	72.0519	109.2779	113.2467	-12.0152	118.4893	394.4733	1513.5072
0.2705	70.8449	76.6397	110.5142	72.0351	109.2361	113.2614	-11.6046	118.6212	393.6064	1515.5775
0.2707	70.8491	76.664	110.541	72.0297	109.2662	113.3443	-11.626	118.4487	394.0857	1514.5011
0.2709	70.8378	76.6643	110.5255	72.071	109.2282	113.2357	-11.1291	120.318	395.1636	1513.7606
0.271	70.8454	76.6499	110.5061	72.0342	109.2544	113.4054	-11.528	118.7096	392.992	1512.2503
0.271	70.8603	76.6721	110.4915	72.0632	109.2158	113.4018	-11.5468	119.1939	394.4221	1512.6336
0.2711	70.8392	76.6694	110.4971	72.031	109.2499	113.2486	-11.2612	118.9956	394.6007	1512.2649
0.2712	70.8507	76.6579	110.497	72.0641	109.2373	113.7586	-11.1977	119.9343	395.0824	1513.4912
0.2713	70.8425	76.6738	110.4696	72.0581	109.2083	113.8763	-11.4508	118.9182	394.4115	1513.4539
0.2715	70.8247	76.6584	110.4893	72.017	109.2112	113.7066	-10.9003	118.8793	394.0195	1513.9906
0.2715	70.8415	76.6582	110.485	72.0493	109.2045	113.5715	-11.3758	118.6884	395.4496	1513.5229
0.2717	70.8435	76.6333	110.42	72.0515	109.1778	113.6684	-11.5426	118.3314	394.867	1512.8866
0.2718	70.844	76.6899	110.4418	72.042	109.1661	113.7466	-11.4953	119.9822	394.2314	1514.7189
0.2719	70.8686	76.656	110.4442	72.0616	109.1685	113.5627	-11.5185	119.8266	394.8617	1512.7103
0.2719	70.8325	76.6687	110.4747	72.0266	109.187	113.8621	-11.818	119.2045	394.4591	1513.5152
0.272	70.8348	76.6447	110.4868	72.0512	109.207	113.4483	-11.764	118.153	395.0381	1512.4332
0.2721	70.8356	76.676	110.4675	72.0647	109.2027	113.897	-11.7372	119.2543	394.1743	1513.1465

0.2722	70.8274	76.6475	110.4326	72.0547	109.1603	113.9379	-11.4928	118.918	392.8897	1512.7458
0.2722	70.8269	76.6558	110.4443	72.0323	109.1781	114.0309	-11.3861	119.6004	394.6763	1514.2589
0.2723	70.8124	76.6681	110.4555	72.0601	109.1856	113.8478	-12.0011	120.1634	394.6948	1511.4714
0.2724	70.8216	76.6722	110.4519	72.055	109.1831	113.9007	-12.0825	120.2484	393.975	1512.9382
0.2725	70.8211	76.6589	110.4519	72.0565	109.1319	113.4715	-11.7297	119.04	393.3327	1514.2847
0.2726	70.8154	76.6864	110.4793	72.0333	109.1543	113.6369	-11.651	118.8182	394.4124	1514.0202
0.2726	70.8246	76.6829	110.4321	72.0542	109.1422	113.9815	-11.5474	119.8567	395.1434	1512.4733
0.2727	70.8161	76.6816	110.4475	72.0649	109.1334	113.9554	-11.7336	118.9571	395.4178	1513.5996
0.2728	70.8347	76.6657	110.4461	72.0463	109.1056	114.1429	-11.6062	119.8973	394.1149	1512.9019
0.273	70.8207	76.6765	110.4505	72.0338	109.134	113.9865	-11.6385	119.6004	394.4856	1513.2162
0.2732	70.8489	76.674	110.4271	72.0618	109.1271	113.9555	-11.6218	120.0341	393.8587	1510.8222
0.2732	70.8701	76.6824	110.3998	72.0443	109.1099	114.1432	-11.5793	120.1634	395.6417	1511.6157
0.2733	70.8537	76.6915	110.4233	72.0427	109.1234	114.0698	-11.5672	120.2078	393.903	1512.1848
0.2735	70.8562	76.6825	110.3923	72.0625	109.0878	114.2282	-11.4139	121.032	394.3055	1513.9829
0.2736	70.8195	76.6574	110.3521	72.0596	109.0597	114.5017	-11.3651	119.5352	393.6372	1516.088
0.2737	70.8407	76.6735	110.3676	72.1009	109.0676	114.2974	-11.3732	118.7813	393.2607	1513.387
0.2738	70.8835	76.6928	110.3628	72.0886	109.0439	114.062	-11.4188	118.8086	394.1731	1512.5723
0.2739	70.8567	76.6928	110.3813	72.061	109.0792	114.0229	-11.5456	120.113	394.332	1513.7912
0.2742	70.8401	76.6957	110.349	72.0525	109.0492	114.1287	-11.6352	119.915	393.9983	1513.5689
0.2743	70.8525	76.675	110.3604	72.068	109.0429	114.2091	-11.7524	118.8515	393.4379	1514.6133
0.2744	70.8613	76.656	110.3511	72.0767	109.0417	114.4379	-11.8391	119.2116	393.4475	1511.5986
0.2744	70.8606	76.6831	110.3631	72.0657	109.0556	114.1199	-11.6479	118.6815	392.2917	1514.3167
0.2745	70.8598	76.674	110.3525	72.0928	109.06	114.0913	-11.6596	120.0529	394.618	1513.0552
0.2746	70.8525	76.6954	110.2956	72.0889	109.0308	113.9416	-11.6799	118.0421	394.7336	1514.5492
0.2747	70.8493	76.6855	110.3391	72.062	109.0513	114.1207	-11.7106	120.0493	394.2897	1513.1472
0.2747	70.8645	76.6811	110.3105	72.0745	109.0564	114.4699	-11.8344	119.3388	392.8649	1515.1252
0.2748	70.8471	76.6735	110.3374	72.0261	109.0473	114.5641	-11.6171	120.2084	394.3479	1514.8952
0.2749	70.8502	76.688	110.3528	72.0705	109.0478	114.4924	-11.6777	120.0378	394.6893	1512.874
0.275	70.8537	76.6788	110.3129	72.0555	109.0707	114.3122	-11.7354	119.8826	393.9307	1515.014
0.2753	70.853	76.6916	110.3372	72.0893	109.0614	114.5054	-11.5603	120.9331	395.0418	1512.6106
0.2753	70.8525	76.6877	110.3127	72.0578	109.0453	114.4079	-11.7082	118.2639	393.5542	1513.7316
0.2754	70.8331	76.6938	110.3196	72.0444	109.0573	114.3438	-11.6789	119.5684	393.3936	1514.461
0.2755	70.8349	76.6809	110.2704	72.0874	108.9827	114.2157	-11.3209	120.12	395.1265	1512.2503
0.2756	70.8711	76.6925	110.3182	72.0798	109.0352	114.3721	-11.477	119.9716	392.796	1515.5852
0.2757	70.8486	76.6945	110.3122	72.0469	109.0437	114.373	-11.7099	119.201	392.7854	1514.0289
0.2758	70.853	76.6933	110.316	72.1071	109.0135	114.7145	-11.4821	120.2817	394.6339	1512.2409
0.2758	70.866	76.6885	110.2695	72.0879	109.0298	114.3782	-11.6778	120.8619	393.1278	1513.8599
0.2759	70.8417	76.7356	110.2966	72.0874	109.0092	114.2964	-11.6437	120.9912	393.8919	1512.1767
0.276	70.8672	76.7081	110.2484	72.0747	108.9774	114.7444	-11.6424	120.7245	395.2536	1514.8952
0.2761	70.8989	76.7057	110.2543	72.1125	109.005	114.7524	-11.7635	120.4841	394.3744	1513.2622
0.2762	70.8425	76.6803	110.3049	72.0729	109.0125	114.4051	-11.6822	119.4502	394.2851	1512.2409
0.2763	70.8729	76.7004	110.2497	72.0601	108.9598	114.5584	-11.6846	119.1952	393.2552	1513.8278
0.2764	70.8694	76.7128	110.3041	72.0435	108.9851	114.7835	-11.6994	120.82	393.7176	1514.5272
0.2765	70.8484	76.7137	110.3054	72.0815	109.0153	114.5756	-11.7586	120.5831	395.3119	1512.4266
0.2765	70.8506	76.7111	110.2508	72.0918	108.9582	114.4779	-11.74	120.8023	393.7282	1512.9786
0.2766	70.8527	76.6803	110.2387	72.0718	108.9864	114.511	-11.6683	121.2536	394.8554	1512.4653
0.2767	70.8594	76.7101	110.2615	72.0874	108.9786	114.3286	-11.4004	120.7634	394.3638	1515.1635
0.2768	70.8591	76.6918	110.2605	72.0787	108.9806	114.3633	-11.6642	120.618	394.7391	1511.768
0.2769	70.855	76.7203	110.2786	72.064	108.9765	114.7986	-11.4457	120.6043	394.4697	1513.4156
0.2769	70.8657	76.701	110.1995	72.0906	108.9522	114.6643	-11.5071	120.108	394.0581	1513.9721
0.277	70.8589	76.7023	110.2009	72.0874	108.9539	115.1354	-11.5949	121.2866	394.7346	1512.4649
0.2771	70.8905	76.7053	110.2173	72.0986	108.94	114.7405	-11.5323	120.5662	393.2607	1515.5029
0.2772	70.8645	76.7006	110.2133	72.0805	108.9471	114.8057	-11.3053	120.5796	394.8935	1511.8133

0.2773	70.8706	76.6982	110.1947	72.0909	108.9098	114.7126	-11.5836	119.2913	392.9451	1512.9141
0.2774	70.8508	76.7113	110.2429	72.0862	108.9551	114.6902	-11.5691	120.318	394.3585	1512.0893
0.2775	70.863	76.7113	110.192	72.0954	108.9594	114.9524	-11.719	120.82	392.6848	1512.8099
0.2776	70.8691	76.6992	110.2221	72.129	108.9372	114.8612	-11.4441	120.6365	393.0724	1513.6675
0.2777	70.8565	76.7224	110.193	72.0688	108.9257	114.694	-11.5034	119.8419	394.3681	1510.5818
0.278	70.8829	76.718	110.1759	72.082	108.906	114.9969	-11.7576	121.0615	394.4124	1511.9683
0.2782	70.8459	76.7016	110.1821	72.0854	108.8968	114.8324	-11.403	120.1377	395.0365	1513.8602
0.2783	70.8826	76.7229	110.1913	72.0849	108.9064	115.0257	-11.5027	121.2499	393.8421	1511.7519
0.2783	70.8623	76.7252	110.168	72.093	108.909	115.123	-11.8008	121.0073	393.3734	1513.2699
0.2784	70.8538	76.7043	110.201	72.0744	108.901	114.7693	-11.7151	120.1819	393.8698	1513.3389
0.2785	70.8673	76.7203	110.1307	72.105	108.8935	115.0842	-11.794	120.8804	392.5298	1514.5251
0.2785	70.8569	76.6979	110.1598	72.0872	108.8721	114.9337	-11.7593	120.3145	393.527	1511.3303
0.2787	70.872	76.7179	110.167	72.1311	108.8913	115.1754	-12.0265	120.3569	395.2801	1513.2086
0.2787	70.8548	76.718	110.1504	72.1096	108.8754	115.348	-12.074	120.1782	392.9672	1515.6071
0.2788	70.8484	76.7235	110.1399	72.0864	108.8689	115.2305	-11.9901	120.6644	392.5365	1512.3806
0.279	70.8517	76.7353	110.1508	72.1024	108.8759	115.2635	-11.9195	120.2336	394.6616	1512.0806
0.279	70.8642	76.715	110.1526	72.1091	108.8912	115.1105	-12.0296	119.6994	392.9179	1516.1142
0.2791	70.8435	76.7068	110.1423	72.0554	108.8824	115.191	-12.1264	120.2189	395.2486	1516.1522
0.2792	70.865	76.7449	110.1511	72.1174	108.8706	115.1043	-12.0157	120.2119	391.4931	1515.5009
0.2793	70.8678	76.7259	110.1554	72.1096	108.9106	115.3201	-11.8763	120.7584	394.3571	1510.8863
0.2794	70.8581	76.7308	110.1183	72.1035	108.8689	115.2678	-12.1098	120.014	392.4624	1514.5962
0.2794	70.8274	76.7392	110.1509	72.0897	108.8534	115.5468	-11.9768	121.2647	392.6239	1509.8284
0.2795	70.863	76.7235	110.0875	72.0991	108.7974	114.9888	-11.9824	120.0352	392.1605	1513.8526
0.2796	70.8706	76.7084	110.0901	72.13	108.8629	115.0675	-12.1176	120.2632	394.274	1510.4776
0.2797	70.8506	76.7281	110.0931	72.1169	108.8461	115.0394	-12.0903	120.3852	391.9857	1514.5962
0.2798	70.8405	76.7216	110.1315	72.1364	108.8466	115.2384	-12.1422	121.4864	394.0857	1510.8142
0.2799	70.8698	76.7127	110.1247	72.132	108.8473	115.3062	-12.1428	121.3275	393.8255	1513.4431
0.28	70.8572	76.7323	110.1102	72.1343	108.844	115.1425	-11.8604	122.3011	393.9348	1512.5569
0.2801	70.8622	76.7101	110.0648	72.1374	108.8225	115.6035	-11.898	119.2765	393.4877	1513.4351
0.2801	70.8558	76.7343	110.0885	72.1386	108.8462	115.021	-11.8737	121.2684	393.7757	1512.3531
0.2802	70.8349	76.7345	110.0458	72.1275	108.7916	115.2589	-11.795	120.5937	393.0397	1513.4462
0.2803	70.8784	76.7364	110.1067	72.1259	108.8526	115.2314	-11.8315	120.6538	395.2324	1513.1549
0.2805	70.8469	76.7407	110.0391	72.1164	108.7692	115.3824	-11.771	120.4258	392.7679	1515.9919
0.2806	70.8507	76.7318	110.1037	72.1004	108.8112	115.6425	-11.8111	121.1095	394.3681	1511.1588
0.2806	70.843	76.7114	110.1135	72.1078	108.7959	115.3164	-11.8699	121.7304	393.7092	1511.9042
0.2807	70.8706	76.7408	110.1153	72.12	108.8564	115.5646	-11.8428	120.4488	393.8024	1515.3169
0.2808	70.8718	76.7591	110.0763	72.1292	108.8221	115.2696	-11.8004	121.025	393.7388	1513.5306
0.2809	70.8706	76.7313	110.1024	72.0786	108.8425	115.4706	-11.8386	119.9786	392.8288	1514.8377
0.281	70.8352	76.7396	110.077	72.1055	108.8469	115.4775	-11.8909	121.5093	395.582	1511.6906
0.2811	70.854	76.7428	110.0655	72.0871	108.8007	115.3898	-11.6198	120.3223	391.2174	1513.1065
0.2812	70.8699	76.7181	110.063	72.1205	108.8449	115.7538	-11.5434	120.3003	392.7166	1514.7495
0.2812	70.8622	76.7381	110.0063	72.1341	108.7766	115.4678	-11.6521	121.6638	393.7701	1514.1484
0.2813	70.8713	76.7269	110.0358	72.1588	108.7912	115.4277	-11.7343	121.8062	394.5863	1514.1746
0.2814	70.8512	76.7221	110.0397	72.1221	108.7899	115.4753	-11.8122	120.8656	393.3216	1512.0084
0.2815	70.8637	76.7244	109.9887	72.1519	108.7966	115.2022	-11.819	120.8028	392.2252	1514.2286
0.2815	70.8608	76.7408	110.0393	72.1331	108.8092	115.4606	-11.8175	122.4849	393.4846	1511.7596
0.2816	70.8673	76.7101	110.0768	72.1114	108.8395	115.3963	-11.7624	122.6024	395.0824	1512.8019
0.2817	70.8647	76.7301	109.9877	72.1172	108.7647	115.521	-11.7732	119.7489	392.3352	1513.5689
0.2818	70.8627	76.7488	110.0597	72.1221	108.835	115.7122	-11.8186	119.9897	391.4666	1513.5954
0.2819	70.8774	76.7501	110.0218	72.1421	108.8084	115.6437	-11.7985	122.6437	394.4115	1511.4453
0.2819	70.8504	76.7341	110.0212	72.1747	108.7939	115.4938	-11.8669	121.4717	394.9551	1512.5695
0.282	70.855	76.713	110.0142	72.1466	108.8152	115.4873	-11.8189	121.3961	393.8712	1515.1329
0.2821	70.8579	76.7619	110.0477	72.097	108.8179	115.427	-11.8796	120.4369	391.5663	1513.8759

0.2822	70.8489	76.7386	110.0196	72.1154	108.7846	115.4331	-11.8855	121.3855	392.9761	1513.2316
0.2823	70.8734	76.7341	110.0282	72.1384	108.8135	115.4749	-12.1736	121.4199	394.7114	1512.834
0.2824	70.8655	76.7454	110.0382	72.1392	108.796	115.7752	-11.6573	121.6507	396.064	1511.4683
0.2824	70.8775	76.7407	109.9807	72.1336	108.7685	115.8078	-11.5988	121.2388	392.2972	1515.1743
0.2825	70.8905	76.7544	109.9896	72.1264	108.7834	115.7903	-11.6144	120.8306	391.4401	1517.8085
0.2826	70.8844	76.7501	110.0129	72.1356	108.768	115.6583	-11.6988	120.6069	392.8897	1512.9061
0.2827	70.8904	76.7337	109.9956	72.1228	108.8111	115.1487	-11.7222	122.2445	395.2536	1511.246
0.2828	70.8748	76.7279	110.0235	72.1243	108.7861	115.6907	-11.6916	121.5305	393.7017	1513.4616
0.2829	70.867	76.7481	110.0431	72.1205	108.7582	115.7307	-11.7137	120.4739	393.5652	1514.1164
0.283	70.8647	76.756	110.0291	72.1317	108.8018	115.9277	-11.6337	120.6143	393.3604	1514.7335
0.2831	70.8724	76.7433	109.9962	72.1417	108.8066	116.0011	-11.4327	120.9986	393.831	1512.5534
0.2832	70.889	76.7547	109.9878	72.1331	108.7705	115.7605	-11.6435	121.9373	394.5598	1513.7958
0.2834	70.877	76.7504	109.9938	72.1239	108.7565	115.9815	-11.6205	122.3623	394.3405	1513.8839
0.2836	70.8578	76.7338	109.9845	72.117	108.7522	115.7363	-11.6782	121.1649	393.2773	1514.1404
0.2838	70.8594	76.7369	109.9534	72.1286	108.7568	115.8223	-11.9059	120.5018	390.7781	1511.7596
0.2839	70.8517	76.7481	109.9345	72.1325	108.7399	115.9853	-11.8381	120.2078	393.1389	1514.6694
0.284	70.8788	76.7675	109.9455	72.1616	108.766	115.609	-11.5887	120.8545	393.2496	1513.6595
0.2841	70.8869	76.7348	109.9106	72.172	108.7235	115.7094	-11.6018	120.5589	391.9317	1514.9098
0.2842	70.8538	76.7425	109.9524	72.1507	108.7251	115.7855	-11.6977	121.2832	392.1311	1514.3007
0.2844	70.8614	76.7425	109.9633	72.1618	108.7486	116.0076	-11.685	121.6564	391.4888	1513.2187
0.2846	70.8589	76.7486	109.9462	72.1506	108.7304	115.8676	-11.7215	121.0038	392.6954	1513.9522
0.2849	70.8706	76.7568	109.976	72.1415	108.7287	116.067	-11.4538	122.366	392.3969	1511.223
0.285	70.8699	76.7717	109.9736	72.176	108.7146	116.2843	-11.6062	121.785	394.2473	1510.809
0.2852	70.8518	76.7683	109.9486	72.1677	108.7231	116.103	-11.6978	121.4315	394.6233	1514.3509
0.2855	70.8532	76.7802	109.8978	72.1564	108.7007	116.3606	-11.7216	121.0282	392.6405	1514.3247
0.2855	70.8459	76.7381	109.9178	72.1437	108.7044	116.0142	-11.7915	121.0144	392.3458	1514.6882
0.2857	76.7939	109.9652	121.1407	108.7329	116.5083	122.7023	-11.6146	122.7023	394.3626	1511.4794
0.2859	70.8723	76.7644	109.9557	72.1334	108.7423	115.7698	-11.5925	121.2229	392.367	1515.4702
0.2861	70.8662	76.7705	109.9469	72.1538	108.7047	116.502	-11.6839	122.7111	394.0142	1509.9503
0.2863	70.8515	76.7733	109.9061	72.1445	108.6864	115.9695	-11.5702	121.0393	392.1422	1513.411
0.2865	70.8257	76.7666	109.9009	72.1753	108.6682	116.4034	-11.5802	122.0961	395.2642	1511.6753
0.2866	70.8132	76.7733	109.8838	72.1422	108.6465	116.4339	-11.5507	122.0703	392.718	1514.1644
0.2867	70.8337	76.7601	109.8252	72.1496	108.619	116.2639	-11.4874	121.4315	391.8956	1513.5919
0.2868	70.8502	76.7746	109.8896	72.1532	108.6624	116.2918	-11.4112	122.9573	394.3958	1511.4313
0.2869	70.829	76.7738	109.858	72.172	108.6583	116.3791	-11.5202	122.0482	393.0669	1513.411
0.287	70.8288	76.7601	109.8256	72.1647	108.6698	116.119	-11.5116	120.4276	392.9443	1511.7749
0.2871	70.817	76.7822	109.8475	72.1895	108.6603	116.6337	-11.8158	122.7356	394.5786	1512.1928
0.2872	70.864	76.7654	109.8427	72.1667	108.6355	116.5854	-11.4717	120.6993	392.2197	1514.6133
0.2873	70.8308	76.7839	109.7947	72.1968	108.6389	116.7446	-11.6816	121.6082	394.8511	1511.2
0.2874	70.8522	76.7741	109.8108	72.193	108.6061	116.4785	-11.6209	121.1649	393.2552	1514.437
0.2875	70.8178	76.7734	109.8118	72.1702	108.6272	116.5651	-11.5336	120.926	392.3935	1513.9752
0.2876	70.8376	76.7639	109.8204	72.1618	108.6286	116.5011	-11.637	122.9763	393.1456	1515.8535
0.2876	70.8211	76.7659	109.7915	72.2015	108.6119	116.0391	-11.4864	121.8745	394.1743	1513.1065
0.2877	70.8389	76.7676	109.7935	72.1809	108.5993	116.3092	-11.7299	121.1098	392.1869	1511.4836
0.2878	70.8535	76.7957	109.8138	72.1808	108.6116	116.5779	-11.816	122.4399	394.9495	1513.2187
0.2878	70.8511	76.7895	109.8117	72.2018	108.6247	116.4407	-11.5953	121.7638	393.0079	1515.3092
0.288	70.8476	76.7899	109.7533	72.1882	108.629	116.6485	-11.5678	120.9062	394.1633	1515.6312
0.2881	70.8367	76.7611	109.8006	72.1877	108.6159	116.4246	-11.6266	123.2197	393.9695	1513.0424
0.2882	70.8481	76.772	109.7794	72.1787	108.5803	116.6157	-11.4232	121.6188	393.7918	1513.5689
0.2883	70.829	76.7764	109.7952	72.1771	108.603	116.3132	-11.5814	121.468	392.5851	1513.8358
0.2883	70.8217	76.7993	109.8257	72.1624	108.6267	116.6042	-11.534	124.0084	394.0301	1512.4496
0.2884	70.8433	76.7988	109.7955	72.1755	108.6132	116.5615	-11.4875	121.6294	391.8745	1512.9479
0.2886	70.8543	76.7608	109.7905	72.1927	108.6209	116.4915	-11.5591	121.819	394.0636	1509.7081

0.2886	70.8415	76.78	109.7515	72.2041	108.5741	116.7037	-11.6589	121.2689	393.0291	1512.7563
0.2887	70.8384	76.8158	109.7748	72.1715	108.5997	116.6762	-11.5906	122.0501	393.7282	1518.4371
0.2888	70.8604	76.7842	109.784	72.1736	108.6425	116.7206	-11.692	122.2339	392.9232	1512.7486
0.289	70.8469	76.7903	109.7854	72.1775	108.596	116.7659	-11.6173	123.2944	394.1837	1511.3533
0.2891	70.8466	76.7837	109.7159	72.2114	108.5965	116.4934	-11.6808	121.6269	392.6405	1514.9659
0.2892	70.8408	76.8158	109.6999	72.2126	108.5705	116.4345	-11.5464	122.7076	393.8765	1513.6532
0.2893	70.8527	76.8052	109.7481	72.2109	108.571	116.9792	-11.8234	122.5175	393.006	1512.2729
0.2894	70.8481	76.8061	109.7087	72.2265	108.5817	116.7979	-11.74	121.2088	392.6689	1513.4846
0.2895	70.8594	76.793	109.7335	72.2175	108.6161	116.5375	-11.764	122.9975	393.5164	1513.2546
0.2896	70.8586	76.8008	109.7019	72.2099	108.5499	116.9068	-11.7723	121.3423	393.7923	1510.9985
0.2897	70.8535	76.7895	109.7088	72.2241	108.5794	116.6344	-11.7343	121.6224	392.9761	1515.3322
0.2897	70.8596	76.7687	109.7305	72.2032	108.566	116.6541	-11.6293	121.2758	391.9041	1512.337
0.2898	70.8428	76.7748	109.6886	72.204	108.5692	117.0015	-11.6374	121.6749	393.2662	1516.3125
0.2899	70.8548	76.7843	109.7624	72.1923	108.6054	116.812	-11.6415	123.1384	392.8731	1514.1003
0.29	70.8452	76.7885	109.7715	72.1829	108.5845	117.0111	-11.5909	122.2268	393.1403	1514.7572
0.2901	70.8445	76.7878	109.7011	72.2236	108.5501	116.6815	-11.5993	121.7744	392.4147	1510.7093
0.2902	70.8386	76.8136	109.7241	72.1884	108.5779	116.5171	-11.4872	121.8557	391.3819	1516.2522
0.2903	70.8379	76.798	109.7125	72.1925	108.5579	116.9272	-11.5885	122.7171	394.4069	1513.379
0.2903	70.8506	76.8134	109.7515	72.1796	108.5764	116.7499	-11.4106	121.7037	392.2611	1513.3926
0.2904	70.8556	76.8054	109.7464	72.2066	108.5994	116.9894	-11.538	123.8516	395.0271	1513.7958
0.2905	70.8386	76.799	109.7539	72.1918	108.6005	117.1382	-11.5927	121.9052	393.2357	1512.9019
0.2907	70.8264	76.7966	109.6857	72.1982	108.5851	116.948	-11.6355	123.2096	393.0397	1513.7452
0.2907	70.8471	76.8123	109.6781	72.201	108.5738	116.9272	-11.6874	122.9425	394.5343	1509.9486
0.2909	70.8647	76.8095	109.6683	72.2114	108.5364	117.0814	-11.9788	122.6247	392.9672	1512.0004
0.291	70.8777	76.7893	109.6917	72.1823	108.5479	117.0653	-11.6878	121.8946	392.4094	1513.1242
0.2911	70.8775	76.812	109.6735	72.2065	108.5466	117.2375	-11.7212	123.2419	393.604	1513.6755
0.2912	70.8538	76.819	109.6726	72.1799	108.5191	117.2022	-11.7848	121.7638	391.5514	1513.7299
0.2912	70.8521	76.7978	109.6936	72.216	108.5834	117.1338	-11.7786	121.8309	393.8765	1511.9359
0.2914	70.8344	76.8276	109.7172	72.1947	108.5752	117.0443	-11.6648	122.1923	392.0813	1515.3747
0.2915	70.8594	76.8169	109.6735	72.2039	108.5441	116.5129	-11.7271	121.7414	392.6737	1512.321
0.2916	70.863	76.7975	109.6905	72.1906	108.5335	117.0405	-11.7567	122.148	391.6438	1514.6534
0.2917	70.8547	76.8078	109.6965	72.1945	108.5479	116.8005	-11.5837	121.6471	393.3204	1516.0145
0.2919	70.8784	76.8022	109.7116	72.1903	108.5414	117.1622	-11.4817	122.036	390.8099	1512.3423
0.2919	70.8655	76.823	109.7016	72.2019	108.527	117.2635	-11.5652	122.8427	393.1056	1514.461
0.2922	70.851	76.8187	109.7011	72.1836	108.5491	117.1594	-11.5009	123.179	394.2519	1513.6194
0.2923	70.8482	76.8108	109.6735	72.1988	108.5366	117.3415	-11.5711	123.0164	392.8952	1512.2569
0.2925	70.8648	76.8227	109.7066	72.2121	108.546	117.1515	-11.5327	123.2378	393.6594	1512.7639
0.2926	70.8594	76.8222	109.6963	72.1894	108.5717	117.4341	-11.6568	123.1176	393.5005	1512.6719
0.2927	70.8491	76.8095	109.6634	72.239	108.5124	117.3985	-11.6788	123.3792	393.9507	1513.6532
0.2928	70.8655	76.8128	109.6788	72.2221	108.4992	117.1724	-11.8348	122.6469	394.6062	1513.6755
0.2928	70.8806	76.8239	109.6094	72.2304	108.4776	117.3506	-11.528	122.8278	392.42	1514.4659
0.293	70.8525	76.8202	109.662	72.24	108.5086	117.4021	-11.798	121.4881	391.2706	1513.4156
0.2931	70.8852	76.7942	109.6686	72.2347	108.5015	117.2663	-11.6879	122.7282	392.8897	1513.948
0.2932	70.8838	76.8027	109.6823	72.2094	108.5409	117.1808	-11.4626	121.6719	393.1032	1514.8722
0.2934	70.8719	76.8243	109.664	72.1994	108.4819	117.4521	-11.4103	122.451	393.5652	1515.6232
0.2935	70.877	76.83	109.6639	72.2077	108.5273	117.4376	-11.4847	121.6082	392.0651	1513.7759
0.2936	70.8577	76.8351	109.6607	72.2142	108.5193	117.3612	-11.2907	124.1958	392.7854	1513.7682
0.2937	70.854	76.8071	109.6936	72.1964	108.5474	117.2777	-11.3513	122.9409	392.4518	1517.0418
0.2938	70.8897	76.8353	109.6855	72.2174	108.5296	117.5594	-11.3035	122.7147	390.9687	1513.8756
0.2939	70.8755	76.81	109.6466	72.2456	108.5072	117.4372	-11.3862	123.7629	393.46	1513.2748
0.294	70.888	76.8327	109.6326	72.2313	108.5032	117.2505	-11.4865	123.5929	393.078	1511.7199
0.294	70.8772	76.8521	109.6476	72.2106	108.4965	117.4021	-11.4299	123.0187	395.0947	1513.0322
0.2941	70.866	76.8337	109.5897	72.2386	108.4878	117.5635	-11.3737	122.5397	391.4777	1515.2545

0.2942	70.8657	76.8212	109.6034	72.2292	108.4787	117.7335	-11.3905	121.838	392.9973	1514.8645
0.2942	70.888	76.8239	109.6245	72.2091	108.4831	117.2679	-11.2761	121.4598	394.3267	1512.5109
0.2943	70.8882	76.8227	109.6163	72.2428	108.4919	117.4874	-11.2818	123.386	392.8897	1513.0504
0.2944	70.8887	76.8465	109.6192	72.2209	108.4898	117.4252	-11.3132	123.1212	392.3352	1513.1549
0.2945	70.9025	76.8217	109.6619	72.2228	108.4798	117.3434	-11.3114	123.3195	393.5154	1512.8179
0.2947	70.866	76.8361	109.5811	72.226	108.4732	117.4963	-11.1	123.1601	393.8395	1512.5263
0.2947	70.8768	76.824	109.6158	72.1912	108.4989	117.9593	-11.2541	122.7577	392.2363	1514.0442
0.2949	70.8782	76.8409	109.6314	72.2113	108.4876	117.5922	-11.3453	124.1322	392.5895	1512.1276
0.2952	70.8599	76.8227	109.66	72.2258	108.497	117.6793	-11.0232	123.5949	392.616	1512.3806
0.2953	70.8811	76.8334	109.626	72.245	108.5117	117.6992	-10.9904	122.2145	393.0503	1514.3247
0.2954	70.8687	76.8339	109.6032	72.2119	108.4833	117.6207	-10.8287	122.2162	392.4783	1510.832
0.2955	70.878	76.8329	109.6145	72.195	108.4851	117.4214	-10.9053	123.2788	393.1499	1512.0725
0.2958	70.8657	76.848	109.5981	72.2531	108.4734	117.2519	-10.9602	124.9346	392.0333	1512.5109
0.2958	70.8628	76.8207	109.6304	72.2128	108.489	117.7451	-10.8433	123.1742	394.4327	1514.1132
0.2959	70.8599	76.8275	109.6019	72.2448	108.4629	117.7753	-10.9154	123.259	391.1065	1512.8253
0.296	70.8709	76.8531	109.547	72.228	108.4271	118.2178	-10.9288	123.1176	392.6054	1512.1506
0.2961	70.8824	76.8474	109.5556	72.255	108.4763	117.9871	-10.877	123.0164	392.5907	1511.3352
0.2965	70.8586	76.839	109.5312	72.2506	108.4093	117.3592	-11.06	122.5212	393.1832	1513.0183
0.2966	70.8823	76.8451	109.6053	72.2116	108.4807	117.6669	-10.815	122.9268	392.0492	1514.1976
0.2967	70.8782	76.8556	109.5527	72.224	108.4689	118.1058	-10.9773	124.3938	391.9009	1513.3619
0.2967	70.8936	76.849	109.6027	72.2309	108.4804	117.6473	-11.2262	123.3156	392.8331	1513.7912
0.2969	70.8758	76.8434	109.5757	72.2182	108.4583	117.8801	-10.9973	123.1106	393.2939	1514.1286
0.297	70.8709	76.8513	109.6148	72.2208	108.4678	117.7112	-11.0507	122.8649	392.9506	1515.5671
0.2971	70.8758	76.8312	109.5929	72.2039	108.4419	117.8028	-11.0295	123.3934	392.6371	1514.5885
0.2972	70.8609	76.8515	109.5789	72.2532	108.452	117.9843	-11.0617	122.0519	393.0281	1515.1343
0.2973	70.8612	76.8569	109.5633	72.2118	108.4464	118.172	-11.2758	122.7429	391.8265	1513.379
0.2974	70.8829	76.8556	109.5935	72.2246	108.4314	117.7893	-11.0957	122.7873	393.1998	1513.8759
0.2976	70.8602	76.8457	109.5427	72.2241	108.4384	117.5524	-11.325	121.7414	391.4832	1513.5313
0.2977	70.8551	76.8533	109.5676	72.2341	108.4306	117.7512	-11.2216	123.1458	392.563	1512.6977
0.2978	70.8852	76.863	109.5922	72.231	108.4502	118.1265	-11.3208	124.3838	393.3936	1511.1027
0.2979	70.8665	76.8634	109.5637	72.2303	108.4079	118.2427	-11.0337	122.5521	392.0757	1513.4769
0.298	70.855	76.8592	109.5544	72.238	108.4226	118.1387	-11.2149	122.2693	392.3035	1511.6906
0.2981	70.852	76.8604	109.5854	72.2139	108.4183	117.9955	-11.2363	122.7799	393.5542	1510.2932
0.2981	70.8433	76.8645	109.5495	72.2208	108.4452	118.4367	-11.3144	124.2618	391.9594	1511.223
0.2982	70.8635	76.8617	109.5174	72.2111	108.388	118.0382	-11.3579	124.4281	393.9695	1512.9702
0.2983	70.8953	76.8653	109.5628	72.227	108.4358	118.2853	-11.5347	122.5026	391.7791	1514.0442
0.2983	70.8494	76.8682	109.5689	72.2014	108.4298	117.9823	-11.2313	124.0261	392.134	1513.4462
0.2986	70.8701	76.8646	109.5507	72.2367	108.4333	117.9299	-11.3513	123.7221	391.7579	1514.1899
0.2987	70.9049	76.8648	109.5157	72.2348	108.3963	117.9425	-11.069	123.8073	393.1056	1514.0362
0.299	70.8911	76.8561	109.5601	72.2085	108.398	118.0865	-11.1536	123.5523	392.1975	1512.0405
0.2992	70.875	76.8695	109.5349	72.2743	108.3671	118.4071	-11.1205	123.6832	392.5895	1513.2009
0.2994	70.8596	76.8732	109.5026	72.2547	108.3606	118.1729	-11.2811	123.8073	391.4998	1514.3488
0.2996	70.8569	76.8685	109.5323	72.2447	108.3932	118.6434	-11.0448	124.3089	392.2717	1512.4803
0.2997	70.8784	76.8558	109.535	72.253	108.3959	118.4177	-11.2863	124.8957	391.795	1513.0476
0.2997	70.8773	76.8831	109.5681	72.2397	108.3809	118.4823	-11.5022	122.6579	393.1167	1512.2809
0.2998	70.8738	76.8658	109.5261	72.2336	108.3774	119.5453	-11.8205	124.977	393.4263	1514.5962
0.2999	76.8716	76.8716	109.5464	72.2333	108.3978	120.4241	-11.4554	126.4758	392.6054	1513.2086
0.3	70.863	76.8526	109.5578	72.2365	108.3875	122.0652	-11.5246	127.1863	391.2601	1514.2436
0.3001	70.8831	76.8737	109.5435	72.2121	108.399	123.7521	-11.6475	129.1622	391.5109	1513.6755
0.3002	70.8814	76.8685	109.5637	72.2279	108.4103	125.6585	-11.7357	130.7707	390.3385	1515.3015
0.3004	70.8765	76.8709	109.5064	72.2208	108.3937	127.5414	-11.6347	133.68	390.0525	1512.9402
0.3006	70.8561	76.9002	109.5352	72.2317	108.3932	130.0643	-11.6707	134.6908	389.7169	1512.297
0.3007	70.8602	76.8839	109.5287	72.2456	108.4018	130.9589	-11.7286	136.4203	388.853	1513.8118

0.3008	70.8936	76.8685	109.5669	72.2116	108.4326	131.5043	-11.846	135.3909	389.0037	1513.9446
0.3008	70.8748	76.8911	109.5465	72.2031	108.3762	131.9166	-11.5709	138.1764	388.2305	1512.7103
0.3009	70.8736	76.8948	109.5174	72.2174	108.4072	132.4444	-11.6201	139.1414	388.9667	1513.5076
0.301	70.8666	76.8851	109.5442	72.2358	108.4098	132.6635	-11.7875	137.991	388.9327	1511.6077
0.3011	70.878	76.889	109.5453	72.2139	108.3958	133.2682	-11.6032	138.7707	389.0801	1513.403
0.3013	70.8492	76.8704	109.5264	72.21	108.3894	133.9139	-11.2921	138.7486	387.884	1515.7594
0.3014	70.8814	76.8872	109.5036	72.2353	108.3516	134.1898	-11.2789	139.1034	384.8275	1515.4388
0.3015	70.865	76.8913	109.4885	72.2481	108.3289	134.7611	-11.3704	140.6149	388.3547	1515.2385
0.3015	70.876	76.8869	109.5194	72.2284	108.3724	134.9413	-11.4125	139.8203	388.8143	1513.7717
0.3017	70.8794	76.8811	109.4987	72.2228	108.3692	134.8373	-11.3856	141.3154	387.2718	1513.8832
0.3018	70.888	76.876	109.5249	72.2263	108.4456	135.5841	-11.6494	139.5099	387.9449	1511.9603
0.3019	70.8911	76.8855	109.5419	72.2374	108.3909	135.7161	-11.5028	141.0856	388.0716	1513.9062
0.302	70.8985	76.9068	109.5425	72.2315	108.4256	135.9027	-11.6973	141.2985	388.3602	1512.3931
0.3021	70.8797	76.8887	109.5042	72.248	108.3844	136.2714	-11.7832	141.7714	387.0017	1514.9565
0.3023	70.8811	76.8767	109.5257	72.2298	108.4013	136.2873	-11.9296	141.8566	387.9062	1514.1885
0.3024	70.8748	76.8911	109.5263	72.2411	108.4064	137.7935	-11.8075	143.3126	387.8544	1515.4625
0.3026	70.8814	76.8831	109.5131	72.2228	108.4173	139.743	-11.9173	144.3342	387.7485	1511.6676
0.3026	70.8885	76.8918	109.5173	72.2518	108.3929	139.8461	-11.8162	145.8478	386.1232	1515.7915
0.3028	70.9123	76.9231	109.5277	72.2318	108.4209	142.4824	-12.1545	148.3202	386.2007	1515.3106
0.3029	70.8816	76.9126	109.5061	72.223	108.4127	143.4785	-12.2423	148.562	386.2813	1515.5929
0.303	70.8916	76.8897	109.5156	72.2067	108.4163	143.9353	-12.2251	149.1997	385.7134	1512.329
0.3032	70.8809	76.8777	109.527	72.2247	108.4239	144.6656	-12.2455	149.117	385.6193	1513.2469
0.3034	70.9102	76.9083	109.5184	72.2248	108.3789	145.2748	-12.4904	150.1975	384.6447	1514.3167
0.3034	70.8947	76.9106	109.5312	72.22	108.4168	145.089	-12.2574	148.9595	385.7633	1514.1404
0.3035	70.8821	76.8936	109.5179	72.2252	108.3861	145.7861	-12.3777	149.5164	384.7666	1513.4616
0.3036	70.8821	76.8981	109.5244	72.2182	108.4226	145.743	-12.3646	151.2323	387.1365	1514.437
0.3037	70.8752	76.8989	109.4822	72.2442	108.3879	145.9149	-12.401	150.7888	384.606	1514.445
0.3037	70.8912	76.9026	109.3877	72.1986	108.4415	146.0713	-13.3492	150.4284	385.4286	1514.2206
0.304	70.9	76.9041	109.5388	72.2245	108.4118	146.1548	-12.9677	150.6547	385.7623	1513.7606
0.3042	70.8794	76.8885	109.5071	72.2167	108.3992	146.5955	-12.7957	151.1708	385.4021	1513.3926
0.3044	70.8821	76.9106	109.5131	72.2447	108.4196	146.799	-12.5324	151.503	385.4233	1514.3279
0.3045	70.9069	76.9177	109.5068	72.2156	108.4024	146.6627	-12.1356	152.0527	385.1486	1513.7797
0.3046	70.8668	76.9058	109.5447	72.2235	108.4429	146.8373	-12.5943	152.2929	385.7688	1512.6656
0.3047	70.9003	76.9162	109.4739	72.2486	108.4098	146.9962	-12.6402	151.9751	386.0567	1513.0343
0.3048	70.8755	76.9246	109.5046	72.2134	108.4078	147.0677	-12.6307	152.6292	384.7112	1515.4789
0.3049	70.906	76.9126	109.4615	72.2167	108.3944	147.3739	-12.5526	151.5066	385.1214	1511.2383
0.3051	70.877	76.9177	109.5039	72.255	108.4321	147.4166	-12.4729	152.461	385.2485	1513.0629
0.3052	70.8858	76.9411	109.4446	72.2557	108.3872	148.0634	-12.4058	151.9661	385.2697	1514.4582
0.3053	70.8727	76.9014	109.4712	72.2738	108.3995	147.6009	-12.3631	153.4644	385.5528	1513.403
0.3054	70.8899	76.916	109.4581	72.2474	108.4103	148.0226	-12.4063	152.8216	385.2591	1512.1429
0.3056	70.8602	76.8966	109.4454	72.2348	108.3963	147.8601	-12.5294	151.6721	386.8984	1515.6793
0.3056	70.8913	76.9073	109.4469	72.2568	108.4028	148.3348	-12.2545	152.3742	384.8275	1511.4233
0.3057	70.8672	76.9104	109.4734	72.2484	108.3944	148.1727	-12.6134	151.2839	384.3322	1511.5526
0.3058	70.8867	76.9226	109.449	72.2406	108.3987	148.3309	-12.5223	152.963	385.3439	1515.1712
0.306	70.8709	76.9073	109.5	72.2496	108.4082	148.4202	-12.5614	153.2649	384.2184	1515.5991
0.306	70.8952	76.9162	109.4795	72.2542	108.4128	148.423	-12.7014	152.8768	384.1464	1511.5436
0.3061	70.8788	76.9203	109.42	72.26	108.3759	149.1597	-12.9164	153.8562	384.4232	1511.5836
0.3062	70.8793	76.8928	109.4456	72.2529	108.4015	148.6534	-12.6248	153.4127	384.9437	1514.1244
0.3063	70.8775	76.919	109.4609	72.2531	108.3917	148.5596	-12.6294	153.7416	385.2981	1512.1928
0.3064	70.8852	76.9318	109.4331	72.2478	108.3739	148.8011	-12.6615	154.8022	385.3756	1513.2027
0.3065	70.8745	76.9007	109.4666	72.2462	108.4225	148.9367	-12.7229	153.4644	385.0379	1514.4289
0.3066	70.8785	76.9265	109.4401	72.2511	108.373	149.1084	-12.5668	155.2748	383.8556	1513.8066
0.3067	70.8733	76.9408	109.4408	72.2591	108.3786	149.1341	-12.6394	154.5572	385.7888	1512.7563

0.3067	70.8767	76.9345	109.4141	72.2442	108.4167	149.4389	-12.5329	154.6915	384.7666	1512.0586
0.3068	70.8734	76.9251	109.4202	72.2858	108.3861	149.2628	-12.6086	154.6618	386.3225	1512.4332
0.3069	70.8758	76.9238	109.4024	72.2689	108.3834	149.6362	-12.6833	154.9743	384.3111	1512.1659
0.3071	70.8826	76.9257	109.3769	72.2625	108.3843	149.6451	-12.7283	154.6279	384.6553	1515.2632
0.3074	70.8831	76.9189	109.436	72.2519	108.3786	149.8636	-12.2624	154.4582	385.0155	1513.4002
0.3075	70.8704	76.9379	109.4264	72.2689	108.3881	150.2484	-12.7828	154.4194	384.0886	1513.1932
0.3078	70.8574	76.9244	109.3944	72.3131	108.3854	150.1063	-12.9065	153.9633	384.7666	1514.8056
0.3078	70.8786	76.9098	109.3816	72.2517	108.3977	150.6023	-12.5583	155.2864	384.7776	1513.8118
0.3079	70.8655	76.9355	109.4002	72.274	108.3595	150.2191	-12.7234	154.437	384.3269	1513.4462
0.308	70.8577	76.9252	109.4329	72.2487	108.4091	150.6118	-12.7631	155.0592	384.7189	1515.3782
0.3081	70.8597	76.9445	109.4065	72.254	108.3699	150.6135	-12.4405	155.1459	384.6004	1517.0178
0.3082	70.8538	76.936	109.4113	72.2951	108.3755	150.7877	-12.5636	155.8439	385.1373	1514.5962
0.3084	70.8507	76.9432	109.418	72.2759	108.3512	150.9739	-12.3484	155.3566	384.988	1512.9782
0.3086	70.851	76.9256	109.3816	72.2823	108.3777	151.1337	-11.855	155.7594	384.1851	1514.1725
0.3087	70.8594	76.9367	109.3719	72.2867	108.3528	150.8402	-11.651	155.2395	383.9085	1512.6106
0.3088	70.8599	76.964	109.4036	72.2823	108.3414	151.2711	-11.8301	156.0949	384.4964	1516.1448
0.309	70.8607	76.9353	109.3753	72.2733	108.3688	151.3947	-12.3646	155.3898	385.3424	1515.7674
0.3092	70.8399	76.944	109.3467	72.2831	108.3493	151.6514	-12.0187	156.0666	385.4816	1511.384
0.3094	70.8877	76.9528	109.3702	72.2899	108.3656	151.5012	-12.4311	156.2116	384.5971	1512.3039
0.3095	70.8461	76.9386	109.3562	72.2896	108.3497	151.3548	-12.9478	156.5909	385.5528	1513.1225
0.3096	70.8601	76.9569	109.3505	72.287	108.3771	151.6559	-12.8494	156.8903	385.2485	1514.0059
0.3097	70.8631	76.9525	109.3921	72.2633	108.3706	152.0122	-12.9108	157.371	384.0515	1512.8713
0.3098	70.8602	76.9475	109.3495	72.2879	108.3505	151.8712	-12.6134	156.0144	385.4642	1512.305
0.3099	70.8455	76.9569	109.3566	72.2785	108.3304	152.1295	-12.4093	157.0776	383.1299	1514.0289
0.31	70.8682	76.9796	109.3452	72.2987	108.3238	151.758	-12.0407	156.1126	384.1257	1515.4319
0.3101	70.853	76.971	109.3001	72.3117	108.3237	151.7003	-11.8372	157.2672	384.617	1515.519
0.3102	70.8653	76.9475	109.3527	72.2937	108.3487	152.1917	-12.2091	156.8866	384.9437	1513.8519
0.3102	70.8467	76.9581	109.339	72.2753	108.3728	152.0681	-12.5367	156.3105	385.4922	1513.4692
0.3103	70.8438	76.944	109.3337	72.2846	108.3247	152.6051	-12.4281	157.0787	383.9969	1513.2588
0.3104	70.8601	76.9423	109.3063	72.3055	108.3209	152.4147	-12.393	156.2787	385.3068	1513.4539
0.3105	70.844	76.9506	109.321	72.3107	108.3764	152.5124	-12.7282	157.8482	384.793	1512.9402
0.3106	70.8716	76.9464	109.3841	72.2674	108.3603	152.4902	-12.7398	156.3812	384.3852	1514.3892
0.3107	70.8482	76.9407	109.4049	72.2983	108.3859	152.6172	-12.8311	157.3818	384.7389	1512.8259
0.3107	70.8575	76.9664	109.3779	72.2806	108.3781	152.388	-12.8667	157.9649	384.3958	1512.3116
0.3109	70.8492	76.9387	109.339	72.3216	108.3296	152.6315	-12.5369	156.7736	384.7771	1512.4343
0.311	70.8484	76.9613	109.3178	72.3425	108.3063	152.6934	-12.5215	156.5244	383.5705	1513.2027
0.3111	70.8672	76.9542	109.3438	72.3265	108.3464	152.6546	-12.4917	157.0423	384.613	1513.6379
0.3111	70.8538	76.959	109.3778	72.2759	108.3387	152.437	-12.2352	157.5813	383.9637	1515.511
0.3113	70.8775	76.9742	109.3587	72.2782	108.3541	152.7861	-12.5629	156.9433	386.864	1515.2325
0.3113	70.8678	76.9552	109.3765	72.295	108.3675	152.9163	-12.4757	158.3981	383.8861	1513.9641
0.3114	70.8494	76.9706	109.4014	72.307	108.3536	153.0731	-12.5626	157.5831	385.2697	1513.0859
0.3116	70.8665	76.9657	109.3496	72.3275	108.2969	152.9025	-12.6325	158.3466	385.4286	1512.3423
0.3117	70.8438	76.9771	109.3354	72.3449	108.3356	153.3868	-12.4524	157.4099	384.0992	1513.2699
0.312	70.867	76.954	109.3157	72.3175	108.3279	153.3254	-12.6109	159.5061	383.7973	1516.2138
0.3121	70.873	76.9654	109.297	72.3443	108.3332	153.326	-12.6088	157.585	384.5838	1513.1145
0.3122	70.844	76.9603	109.3344	72.2926	108.3706	153.5973	-12.8264	158.792	385.2538	1511.0236
0.3123	70.8814	76.9381	109.306	72.2922	108.3271	153.77	-12.751	158.1468	384.2239	1513.8519
0.3125	70.8632	76.9888	109.306	72.3279	108.3372	153.3093	-12.7722	158.3205	384.8773	1514.1965
0.3128	70.8778	76.983	109.294	72.3362	108.3352	154.0013	-12.9521	159.7507	385.3535	1517.7231
0.3129	70.8572	76.971	109.3748	72.3043	108.3606	153.8826	-12.9641	157.9295	383.7178	1514.0442
0.313	70.8556	76.9633	109.3553	72.3014	108.3558	153.8583	-13.0566	159.0337	385.0213	1514.7495
0.3132	70.8691	76.9692	109.3093	72.3312	108.2727	153.9131	-12.6762	158.7861	384.2461	1511.792
0.3132	70.8852	76.9751	109.2837	72.3231	108.2948	154.2475	-12.8128	158.1542	384.1464	1511.6157

0.3134	70.8491	76.9703	109.3033	72.3146	108.3203	153.8684	-12.9189	159.1632	384.8089	1511.3916
0.3136	70.8575	76.9713	109.3409	72.3284	108.3266	154.0354	-12.6726	159.096	385.0208	1513.0169
0.3136	70.9049	76.9972	109.2842	72.3363	108.2802	153.7161	-12.4329	159.1409	385.0822	1513.0424
0.3137	70.8741	76.9927	109.2848	72.3666	108.2777	154.3695	-12.4322	158.3325	383.5272	1516.2522
0.3139	70.866	76.975	109.346	72.3165	108.3293	154.5668	-12.5911	159.0289	384.899	1514.2129
0.3139	70.8731	76.9893	109.3224	72.3072	108.3034	154.6067	-12.5246	158.884	383.7761	1515.1022
0.314	70.9029	77.0044	109.2768	72.3536	108.2842	154.3624	-12.3965	158.3679	384.2157	1514.7419
0.3143	70.8776	76.9725	109.2337	72.3386	108.2599	154.6079	-12.3557	158.8859	384.6337	1515.6071
0.3145	70.886	76.9631	109.3276	72.3193	108.291	154.7965	-11.9956	159.0596	384.2184	1515.0701
0.3147	70.8791	76.974	109.3351	72.3065	108.3286	154.751	-12.2802	158.9635	384.39	1513.7477
0.3149	70.8856	76.9896	109.3308	72.3084	108.3358	155.1692	-12.2812	159.6722	384.4858	1513.7299
0.3149	70.8896	76.9998	109.2402	72.3861	108.299	154.9711	-12.3098	158.5089	384.8275	1515.527
0.315	70.8977	77.0003	109.3276	72.2963	108.3488	154.8086	-12.2527	159.8024	384.2903	1514.1484
0.3153	70.9003	76.9697	109.2724	72.3397	108.3086	155.2266	-11.991	159.7174	383.8197	1512.1767
0.3154	70.9115	76.9983	109.2504	72.3511	108.313	154.9506	-12.105	158.2371	382.1289	1511.5526
0.3155	70.908	77.0054	109.2769	72.3571	108.3156	155.0111	-12.1216	159.6102	383.7034	1513.2347
0.3156	70.8885	76.9901	109.2744	72.3487	108.2962	155.0875	-12.2842	158.9723	385.4922	1513.3159
0.3156	70.8791	76.9766	109.2737	72.3384	108.3073	155.2387	-12.0661	160.523	384.6613	1509.4757
0.3157	70.9115	76.9886	109.3133	72.359	108.3159	155.6126	-12.0825	159.4566	384.025	1513.1779
0.3159	70.8856	77.0091	109.278	72.3377	108.3214	155.29	-12.2135	160.5489	383.9721	1511.8669
0.3159	70.9077	77	109.2957	72.3404	108.3218	155.3641	-12.1494	160.268	385.2095	1514.4209
0.3161	70.8878	77.0056	109.2749	72.3728	108.2885	155.3854	-12.0084	160.1091	382.9725	1512.5855
0.3162	70.8783	77.0039	109.2611	72.369	108.2897	155.3678	-12.1124	159.9872	384.3014	1512.2569
0.3163	70.8824	76.9937	109.2579	72.3685	108.2988	155.5682	-12.6197	159.9197	383.8556	1513.7759
0.3164	70.8631	76.9915	109.2389	72.3394	108.2846	155.1559	-12.6234	160.4075	384.3375	1514.3049
0.3166	70.8623	77.0107	109.306	72.333	108.3095	155.7069	-12.4596	160.3013	384.1132	1513.7797
0.3167	70.8563	76.9847	109.26	72.378	108.2842	155.6792	-12.5258	159.9798	385.2909	1511.9973
0.3168	70.863	77.0064	109.3346	72.3391	108.3256	155.9437	-12.7264	160.7559	384.1408	1514.0041
0.3169	70.8714	77.0217	109.2595	72.3507	108.2693	155.5957	-12.4605	159.7288	385.0155	1513.5689
0.3171	70.8873	76.9937	109.2843	72.3856	108.3108	156.0071	-12.8739	160.6125	384.417	1513.3312
0.3172	70.8674	77.0184	109.2335	72.3792	108.3148	155.9066	-12.8424	160.2274	384.1962	1511.768
0.3172	70.8704	76.9988	109.2684	72.3524	108.3022	155.7245	-13.1302	159.8066	384.5547	1511.9283
0.3173	70.8995	76.9944	109.2514	72.3311	108.3026	155.5192	-13.3745	160.1867	383.4985	1511.0146
0.3174	70.8702	77.0237	109.2588	72.3284	108.3251	156.1165	-13.3659	159.8837	383.9304	1512.1607
0.3175	70.8937	76.9988	109.2636	72.3352	108.3173	155.5239	-13.168	160.0463	383.8418	1515.4308
0.3176	70.8851	77.0159	109.2948	72.3548	108.3022	155.6988	-13.1194	161.0049	383.6649	1513.7069
0.3176	70.8845	77.0151	109.2799	72.3728	108.291	156.0069	-13.2738	160.9222	384.2793	1512.2328
0.3177	70.8776	77.0107	109.2362	72.3743	108.2824	155.5174	-13.0173	160.8815	384.7666	1512.7779
0.3178	70.886	77.0242	109.2846	72.3878	108.3434	155.7375	-13.1382	159.7765	384.5894	1513.4191
0.3179	70.908	77.0023	109.2869	72.3565	108.3159	155.6508	-13.0284	159.8561	384.417	1512.3729
0.318	70.8873	77.0128	109.2679	72.3709	108.3066	155.7905	-12.7889	158.8194	384.1519	1513.5072
0.3181	70.8755	77.0039	109.2372	72.3841	108.2782	155.8561	-12.6413	160.6868	384.1892	1512.2349
0.3181	70.8802	77.0086	109.2453	72.3753	108.2983	155.5006	-12.7705	161.0014	383.7443	1514.5042
0.3182	70.9068	77.0205	109.2864	72.361	108.3154	155.6632	-12.9602	159.7041	384.3005	1510.9776
0.3183	70.8771	77.0306	109.2159	72.3869	108.2872	156.0255	-13.0015	161.4876	383.3878	1514.453
0.3183	70.8661	77.0298	109.2503	72.3759	108.3266	155.9131	-12.8874	160.9332	383.5705	1514.9419
0.3185	70.9247	77.0261	109.1906	72.3856	108.2868	155.7716	-13.259	159.9161	384.3587	1515.0179
0.3186	70.9215	77.0011	109.306	72.3407	108.3296	155.8852	-12.9947	161.3619	385.5916	1513.5393
0.3187	70.8952	77.0563	109.248	72.371	108.2741	155.9707	-12.957	161.2621	383.6314	1513.6515
0.3187	70.899	77.0225	109.2019	72.3824	108.3221	156.0062	-12.9366	158.7496	384.2899	1511.6446
0.3188	70.8715	77.0275	109.2794	72.3468	108.3281	155.7737	-13.0544	160.6487	384.1685	1511.9764
0.3191	70.899	77.0347	109.2044	72.3956	108.2707	155.8323	-12.941	161.5911	384.8718	1515.0862
0.3192	70.8722	77.0207	109.2229	72.3761	108.2817	156.1091	-12.7337	160.0463	383.5927	1514.3007

0.3193	70.8873	77.0278	109.2086	72.3892	108.2664	155.8472	-12.5963	160.3015	385.7252	1512.0586
0.3194	70.8734	77.0286	109.2062	72.3941	108.288	155.9867	-12.7341	161.1039	384.793	1514.0902
0.3194	70.8707	77.0319	109.1968	72.4109	108.2681	156.0468	-12.8089	160.2126	385.0102	1513.8839
0.3196	70.8924	77.0331	109.2234	72.3716	108.2772	156.1565	-12.9464	161.1661	384.617	1513.0263
0.3198	70.8801	77.0438	109.2154	72.3552	108.3168	156.0106	-13.2718	159.7765	384.7776	1514.8297
0.3199	70.8736	77.0264	109.2535	72.369	108.2945	156.2728	-13.3958	160.9978	383.9774	1511.9129
0.32	70.8789	77.0273	109.2417	72.3825	108.3181	156.3088	-13.7218	160.8372	384.4011	1513.5072
0.3201	70.8805	77.0283	109.193	72.3929	108.2964	156.0284	-13.2681	160.6585	384.0039	1513.0859
0.3203	70.8773	77.0563	109.1764	72.3875	108.2854	155.9828	-12.9748	161.7426	383.7588	1514.5572
0.3203	70.886	77.0395	109.2101	72.3835	108.299	156.1462	-13.0428	160.693	384.1021	1512.8259
0.3204	70.867	77.0466	109.1714	72.4246	108.2436	156.1439	-12.8654	160.4853	384.7401	1512.3729
0.3205	70.871	77.0347	109.1599	72.3861	108.2789	156.0812	-13.0544	161.8756	384.1408	1511.6798
0.3206	70.8724	77.0325	109.1748	72.3891	108.271	155.9964	-13.0131	160.7221	384.0568	1513.7299
0.3207	70.863	77.0472	109.2021	72.3831	108.296	156.2939	-13.3453	161.1735	383.8751	1515.4388
0.3209	70.8914	77.0271	109.1762	72.3978	108.2964	156.12	-13.2224	160.7044	384.0674	1513.5842
0.3212	70.8919	77.0227	109.1687	72.3999	108.2697	156.4309	-13.2207	161.6871	384.8778	1513.0936
0.3214	70.9022	77.0403	109.1901	72.3729	108.2959	156.6415	-13.2623	160.5242	384.3534	1513.6916
0.3215	70.9095	77.0549	109.2108	72.3963	108.2878	156.3119	-13.1841	160.8741	383.6437	1515.4625
0.3216	70.9276	77.0301	109.2023	72.4394	108.3037	156.2131	-12.9903	159.8541	383.2992	1511.3752
0.3217	70.884	77.0349	109.1559	72.4101	108.2548	156.3051	-12.7665	161.835	383.8031	1513.1626
0.3218	70.9032	77.0291	109.1637	72.3949	108.2551	156.2541	-12.6851	162.1325	383.7761	1513.0092
0.3219	70.9034	77.0634	109.1865	72.4009	108.3019	156.3927	-12.8189	160.86	383.9456	1514.9795
0.322	70.8824	77.0283	109.181	72.382	108.3251	156.66	-12.7361	160.9443	384.6946	1513.5072
0.3221	70.9073	77.0259	109.1601	72.4083	108.2851	156.4896	-12.503	159.5627	383.7125	1513.7146
0.3222	70.9208	77.0612	109.175	72.4307	108.2976	156.5989	-12.9567	161.0296	383.5272	1514.6422
0.3224	70.9241	77.0393	109.1436	72.4001	108.2701	156.4435	-12.8289	161.7648	384.9216	1512.8179
0.3225	70.9047	77.0556	109.1629	72.4095	108.2292	156.2754	-12.9423	160.8113	382.7122	1513.395
0.3226	70.9303	77.0512	109.1865	72.4058	108.2779	156.5927	-12.7593	161.3937	384.1204	1510.625
0.3226	70.899	77.0551	109.1343	72.3958	108.2608	156.5271	-12.9443	161.8497	385.1209	1511.6558
0.3227	70.898	77.0312	109.1707	72.4068	108.2813	156.8339	-12.7368	161.0332	384.3111	1515.8612
0.3228	70.8748	77.052	109.1742	72.4202	108.2728	156.4425	-12.7352	161.27	384.364	1511.2076
0.3231	70.8787	77.0632	109.1612	72.4217	108.2887	156.9205	-12.4793	160.1106	384.8089	1513.6456
0.3232	70.9085	77.0393	109.1392	72.4114	108.2498	156.8006	-12.6897	161.422	383.5325	1513.9752
0.3233	70.8907	77.0507	109.1027	72.3987	108.2781	156.5633	-12.8384	161.3089	384.7877	1513.5152
0.3236	70.9044	77.0502	109.1483	72.4101	108.2448	156.7166	-12.8321	162.138	383.8308	1510.9504
0.3237	70.9044	77.068	109.1833	72.3869	108.2948	156.6181	-12.948	160.3863	384.235	1512.2328
0.3237	70.9171	77.0624	109.1844	72.4013	108.2734	156.5642	-12.8886	162.1149	383.7973	1515.0102
0.3238	70.8988	77.0726	109.1782	72.4047	108.2621	156.7742	-13.0785	161.6095	384.2571	1515.1182
0.324	70.8765	77.0585	109.1915	72.3694	108.3069	156.9428	-13.1451	160.2696	384.0833	1512.8176
0.3241	70.8812	77.0678	109.185	72.3912	108.2463	156.725	-12.9872	162.0715	383.3158	1511.5756
0.3243	70.8771	77.0713	109.1702	72.4297	108.2867	156.8374	-12.9653	160.7078	384.4565	1513.6194
0.3244	70.9133	77.0566	109.1744	72.3932	108.2633	157.091	-12.905	161.4174	385.0379	1513.4271
0.3246	70.8997	77.0549	109.1618	72.4173	108.2436	156.9587	-13.0391	162.3871	383.1246	1511.8746
0.3247	70.8978	77.0487	109.1262	72.4386	108.2603	157.0863	-13.1612	161.6908	384.9493	1513.0744
0.3247	70.8851	77.0573	109.161	72.4117	108.2597	156.9259	-13.0263	161.4574	383.7178	1514.1362
0.3248	70.8873	77.0473	109.1298	72.4459	108.2476	157.1631	-13.2189	161.3301	383.4424	1514.4429
0.325	70.9011	77.0775	109.1918	72.4058	108.2606	156.8012	-13.0687	161.1217	383.5041	1512.9462
0.3252	70.8868	77.081	109.1571	72.4368	108.2435	156.9999	-13.1485	161.6021	384.9714	1514.0041
0.3253	70.8839	77.0732	109.192	72.4212	108.2858	156.9543	-12.8691	161.5069	384.0303	1513.1549
0.3255	70.8955	77.0719	109.1611	72.4359	108.2751	156.7724	-13.2345	161.7167	383.648	1515.7113
0.3257	70.9041	77.0933	109.19	72.4116	108.2713	157.3529	-13.7027	161.1365	383.9913	1511.5516
0.3257	70.8824	77.0945	109.1928	72.4272	108.2541	157.0743	-14.1186	161.1624	384.39	1513.6515
0.3259	70.8934	77.0656	109.1418	72.4483	108.2524	157.3479	-14.1554	161.5175	383.3948	1513.7146

0.326	70.9062	77.0826	109.1714	72.4284	108.2653	157.2731	-13.7865	161.4506	383.9249	1513.94
0.3261	70.91	77.0838	109.2204	72.4017	108.2792	157.3176	-13.7928	159.2961	383.6314	1513.6916
0.3262	70.9068	77.079	109.1704	72.4285	108.269	157.0929	-13.6596	162.9173	384.6077	1513.0629
0.3263	70.8832	77.1029	109.1604	72.3994	108.2593	156.7194	-13.6687	161.8682	383.6314	1512.0245
0.3264	70.91	77.0919	109.2187	72.4288	108.2837	157.3435	-13.6207	160.8812	384.6712	1512.4419
0.3265	70.8961	77.0732	109.1905	72.4392	108.2483	157.0147	-13.59	161.9805	384.3905	1513.1932
0.3266	70.9008	77.0721	109.1341	72.4058	108.2455	156.6655	-13.6307	160.4011	382.8617	1513.5553
0.3267	70.9047	77.0861	109.2008	72.4022	108.2897	157.3325	-13.4866	162.4891	382.9725	1513.9
0.3267	70.8551	77.0876	109.1988	72.4333	108.2776	156.6841	-13.0129	161.0589	384.5949	1513.1385
0.3269	70.8789	77.0782	109.1082	72.4585	108.2171	154.5485	-12.7681	159.9096	384.6503	1514.2847
0.327	70.907	77.091	109.129	72.4721	108.233	153.1021	-12.5013	157.6516	383.4321	1511.6077
0.3272	70.8934	77.08	109.1551	72.445	108.2616	151.0714	-12.5886	155.3455	384.7832	1511.4714
0.3272	70.8983	77.095	109.1248	72.4525	108.2463	150.0951	-12.1709	154.6655	384.6613	1513.7877
0.3273	70.8792	77.1099	109.0969	72.4637	108.2484	149.3838	-12.0527	153.1079	383.6172	1513.1856
0.3276	70.902	77.0912	109.1172	72.4476	108.2542	148.8791	-11.9913	153.2316	384.3375	1514.5349
0.3277	70.9093	77.0985	109.1245	72.4356	108.2375	148.9769	-11.6255	152.7367	385.1532	1510.947
0.3278	70.8775	77.0839	109.1152	72.4212	108.233	149.04	-11.2805	154.7021	383.6702	1514.1976
0.328	70.8807	77.1029	109.0878	72.4965	108.2018	149.3808	-11.8272	154.1149	384.1353	1514.0843
0.3281	70.8721	77.0907	109.1187	72.459	108.2461	149.5082	-11.467	153.723	383.4901	1515.1789
0.3282	70.8954	77.0919	109.0768	72.4578	108.2282	149.3287	-11.2691	154.5183	383.9509	1514.9795
0.3283	70.8836	77.0948	109.1243	72.4403	108.2541	149.4673	-11.2445	154.3734	384.1151	1512.9326
0.3285	70.8885	77.0778	109.1399	72.4659	108.2769	149.6735	-11.497	154.2426	384.6712	1513.2316
0.3285	70.9112	77.1126	109.088	72.4424	108.2059	149.4211	-11.4373	154.1719	385.0949	1511.3456
0.3286	70.9286	77.0861	109.0633	72.4564	108.2484	149.7081	-10.8845	153.6982	383.5695	1510.5483
0.3288	70.8963	77.1148	109.0645	72.4966	108.1871	149.502	-10.827	154.7728	385.2803	1512.1736
0.3289	70.9095	77.1011	109.0806	72.4969	108.1971	149.7997	-11.1995	154.1149	384.0024	1513.1546
0.3291	70.9132	77.1073	109.1389	72.4429	108.2639	150.1746	-11.4879	154.992	383.1988	1515.1635
0.3292	70.9132	77.0829	109.1142	72.4617	108.2536	150.1986	-11.3645	154.4759	383.9138	1516.2292
0.3293	70.9197	77.1164	109.1438	72.4616	108.2678	150.083	-11.6731	154.4401	384.8275	1512.1046
0.3294	70.9248	77.1088	109.1227	72.4504	108.2392	149.8954	-11.9902	154.9205	384.2128	1512.4893
0.3295	70.9064	77.0981	109.1041	72.4544	108.2105	150.0505	-11.6822	154.5879	384.5561	1514.8698
0.3296	70.9222	77.126	109.0926	72.4641	108.2344	150.3417	-11.5248	156.0277	383.5007	1516.0222
0.3297	70.9132	77.117	109.1202	72.4654	108.2356	150.2288	-11.2947	155.3101	383.7602	1514.0519
0.3298	70.8998	77.1042	109.0612	72.4747	108.2204	150.3004	-11.4715	154.732	383.9858	1512.9862
0.3299	70.895	77.1223	109.1046	72.4907	108.2261	149.992	-11.8283	154.3957	384.1132	1511.5676
0.33	70.9013	77.1057	109.0481	72.4919	108.1998	150.2948	-12.1725	155.5414	383.9637	1511.3672
0.3302	70.9162	77.095	109.0878	72.4608	108.2495	150.2075	-12.4498	154.6433	383.7809	1512.7218
0.3302	70.9289	77.1154	109.0848	72.4527	108.2214	150.2177	-12.4355	155.3455	385.0323	1511.1508
0.3303	70.92	77.1167	109.0532	72.4946	108.23	150.594	-12.5572	156.1511	382.8617	1514.437
0.3304	70.9187	77.1001	109.1363	72.4539	108.2528	150.1964	-12.4677	155.1275	385.0711	1513.4191
0.3305	70.9122	77.1233	109.0996	72.4493	108.2462	150.3968	-12.2204	155.1581	383.0611	1513.0706
0.3307	70.9062	77.1131	109.1456	72.4507	108.2721	150.3524	-12.2148	155.0462	383.421	1513.5633
0.331	70.9356	77.1042	109.0602	72.443	108.1918	150.5717	-12.4719	154.8577	384.2571	1518.3563
0.3311	70.8932	77.1434	109.0908	72.4996	108.2098	150.6376	-12.6612	154.9685	384.0799	1514.477
0.3313	70.9327	77.117	109.0988	72.4753	108.2382	150.4065	-12.2244	155.1405	383.649	1511.5066
0.3314	70.9077	77.1223	109.0598	72.4554	108.2165	150.6599	-12.3333	155.2753	383.6536	1512.5695
0.3316	70.9233	77.1277	109.0755	72.4866	108.2146	150.5215	-12.5524	155.3972	384.2627	1512.8821
0.3317	70.907	77.1113	109.076	72.4795	108.2126	150.7574	-12.5353	156.4764	383.8695	1512.9221
0.3318	70.8956	77.097	109.0707	72.4932	108.1813	150.7193	-12.4949	154.4476	384.2634	1512.6336
0.3319	70.911	77.1124	109.0614	72.4788	108.1912	150.5505	-12.4525	154.6915	383.739	1514.3585
0.3319	70.91	77.109	109.0753	72.4783	108.2075	150.6918	-12.4478	154.483	383.8397	1513.2162
0.3322	70.9077	77.1121	109.0873	72.4833	108.2114	151.0798	-12.563	155.5598	384.2627	1515.1182
0.3323	70.9176	77.1092	109.1085	72.4461	108.2431	151.0001	-12.7696	155.2041	383.9721	1514.1516

0.3325	70.8802	77.1355	109.1021	72.5009	108.2111	150.9683	-12.498	155.8444	383.9969	1511.8802
0.3326	70.9177	77.1399	109.1009	72.4614	108.245	151.0417	-12.3896	155.9146	383.4487	1515.7594
0.3327	70.8929	77.1075	109.1031	72.4841	108.2146	150.8764	-12.2754	155.5007	383.2715	1513.371
0.3328	70.9044	77.1419	109.0587	72.49	108.2003	150.9711	-12.2802	155.7077	384.0633	1511.9122
0.333	70.9185	77.1457	109.0898	72.4527	108.2289	151.3297	-12.5143	155.5192	384.5727	1513.948
0.3331	70.8951	77.1331	109.0777	72.4734	108.2099	150.7078	-12.6303	154.9319	383.2041	1512.3806
0.3332	70.8805	77.1404	109.0739	72.4866	108.2109	151.0508	-12.6542	155.4692	383.1299	1512.7333
0.3333	70.9105	77.1557	109.0294	72.4878	108.1929	151.32	-12.4093	155.8969	384.3163	1513.4079
0.3336	70.9213	77.1567	109.0974	72.4666	108.2296	151.1272	-12.2126	155.296	383.7231	1513.9216
0.3337	70.8942	77.1495	109.0517	72.4955	108.2083	150.9172	-12.3251	155.2125	385.1652	1513.948
0.3338	70.8824	77.1448	109.0712	72.4717	108.1482	151.0907	-12.3742	156.2434	384.1998	1512.6489
0.3339	70.9078	77.1214	109.0129	72.4954	108.1955	150.8259	-12.5401	155.3667	383.8026	1514.1669
0.3339	70.8715	77.1243	109.0928	72.4634	108.2219	151.5071	-12.7617	155.5525	382.3302	1515.8396
0.334	70.897	77.1625	109.0758	72.4792	108.2124	151.3585	-12.837	156.8792	384.7444	1511.8802
0.3341	70.8845	77.1602	109.0698	72.4833	108.2013	151.2015	-12.8988	156.4024	382.9393	1515.2705
0.3342	70.881	77.1384	109.0899	72.4663	108.2005	150.9281	-12.732	156.611	383.1723	1514.4429
0.3343	70.8679	77.1641	109.08	72.4836	108.2016	151.0742	-12.4537	155.9738	383.9027	1512.6737
0.3345	70.8812	77.1264	109.0567	72.4828	108.2134	151.26	-12.7027	156.6168	383.9304	1513.2748
0.3347	70.862	77.1226	109.0763	72.5078	108.1777	151.0389	-12.2501	154.9427	383.4874	1514.6453
0.3348	70.9037	77.1465	109.0586	72.4906	108.2076	151.3946	-12.3255	156.7383	383.6066	1511.6063
0.3348	70.8702	77.1536	109.0823	72.5088	108.1938	151.1049	-12.3795	154.9649	384.8884	1513.1385
0.3349	70.8883	77.1539	109.0884	72.492	108.2174	151.0268	-12.4204	155.4601	382.9891	1512.2168
0.335	70.8784	77.1669	109.1129	72.4915	108.2646	151.5257	-12.6553	155.4601	382.9226	1515.2625
0.3352	70.8664	77.1523	109.0843	72.4955	108.2259	151.5712	-13.0382	156.2287	384.2793	1513.0183
0.3353	70.8807	77.1819	109.0968	72.47	108.2485	151.5954	-12.8175	156.2731	383.2383	1513.4591
0.3355	70.8905	77.1674	109.0573	72.4844	108.2327	151.2587	-12.912	156.3105	384.1416	1513.0552
0.3356	70.8839	77.1584	109.0568	72.5083	108.1914	151.5546	-12.9201	156.0596	383.4901	1514.4352
0.3358	70.8936	77.1584	109.0741	72.4868	108.1919	151.4515	-13.0453	155.9712	383.0611	1512.7563
0.3359	70.8858	77.1579	109.0453	72.4698	108.1607	151.455	-13.0771	155.9889	383.9774	1513.3619
0.3362	70.8694	77.1605	109.1034	72.4767	108.2274	151.5526	-13.2786	157.6035	384.5063	1512.4893
0.3363	70.9166	77.1643	109.0815	72.4797	108.2233	151.4746	-13.5807	157.2225	383.649	1513.3082
0.3364	70.8975	77.1834	109.0411	72.5001	108.1953	152.0069	-13.6788	155.0535	383.9249	1513.3229
0.3364	70.8749	77.1445	109.0539	72.4907	108.2029	151.623	-13.5673	156.3459	384.3163	1512.8636
0.3366	70.8946	77.1594	109.0858	72.5159	108.1844	151.583	-13.5582	155.4162	382.8969	1514.1362
0.3366	70.8893	77.1492	109.0458	72.5093	108.19	151.7056	-13.4365	156.3211	384.1469	1513.7836
0.3367	70.8784	77.1694	109.0931	72.4968	108.2146	151.7681	-13.632	155.8924	382.452	1512.6817
0.3368	70.8812	77.1728	109.0947	72.4736	108.2221	151.6443	-13.6359	155.3455	383.5801	1514.9335
0.3368	70.8827	77.161	109.0592	72.4854	108.1933	151.7161	-13.3867	157.8437	383.6923	1512.6416
0.3369	70.8758	77.1847	109.0793	72.4981	108.2309	151.6316	-13.5168	157.0529	384.3789	1514.1805
0.337	70.872	77.1656	109.0536	72.4976	108.1902	151.4309	-12.9326	156.2398	383.7698	1513.1225
0.3372	70.8692	77.1682	109.0486	72.5146	108.1784	151.9784	-12.8479	156.6357	384.4329	1513.4922
0.3374	70.8842	77.1676	109.0474	72.5065	108.2015	151.3538	-12.891	156.5577	384.0412	1513.924
0.3375	70.9032	77.1679	109.0479	72.5139	108.2041	151.7154	-12.465	156.3777	384.0992	1514.4045
0.3377	70.8738	77.1674	109.0466	72.5211	108.1983	151.6288	-12.3315	156.554	383.4708	1513.4591
0.3378	70.859	77.1832	109.0796	72.5009	108.2011	152.032	-12.3978	155.0905	384.2239	1513.8839
0.3379	70.8871	77.1628	109.0571	72.4884	108.2063	151.548	-12.459	156.3544	383.5207	1513.6355
0.3381	70.8802	77.1986	109.0102	72.5171	108.1809	151.7936	-12.2446	155.9005	381.4298	1512.1353
0.3382	70.8766	77.1854	109.0451	72.5042	108.1942	151.8991	-12.2988	156.2361	382.9337	1513.7797
0.3382	70.8763	77.1674	109.0479	72.4994	108.2146	152.1221	-12.9796	157.0122	383.8418	1512.5615
0.3384	70.8956	77.2042	109.0935	72.5237	108.2017	151.8913	-12.6932	156.4625	384.1998	1511.5526
0.3385	70.8835	77.2051	109.0135	72.5104	108.1802	151.9586	-12.6128	157.5555	383.3546	1514.8297
0.3386	70.8873	77.1834	109.0318	72.5315	108.1508	152.0124	-12.5101	156.7646	383.5816	1513.4832
0.3387	70.9016	77.1748	109.017	72.5343	108.1586	152.044	-12.6959	154.7653	383.792	1512.7779

0.3388	70.8893	77.1954	109.0692	72.521	108.1919	151.9411	-12.7062	157.1236	383.6172	1510.8626
0.3389	70.9006	77.1967	109.0245	72.5267	108.1561	151.9363	-12.4278	155.8444	383.4044	1514.0122
0.3389	70.8961	77.195	109.0551	72.5213	108.1633	151.7545	-12.1638	156.3671	383.4106	1512.4956
0.339	70.9144	77.184	109.035	72.5106	108.1576	152.0593	-11.9215	156.1621	383.6543	1514.8109
0.3393	70.9154	77.1923	109.0104	72.5271	108.1643	152.0699	-12.3525	156.5792	383.7073	1513.7682
0.3395	70.9172	77.1725	109.025	72.5195	108.1741	151.8945	-12.2111	158.095	383.9969	1513.0504
0.3395	70.9134	77.1661	109.0616	72.5133	108.2233	152.2753	-12.2885	156.4431	383.4487	1514.8698
0.3399	70.9183	77.1952	109.0335	72.4944	108.1777	152.1899	-12.4694	156.1868	383.9456	1517.1568
0.3399	70.9198	77.2088	109.0661	72.4934	108.2031	152.2841	-12.3708	157.0246	382.8386	1514.2666
0.3401	70.9098	77.1989	109.0179	72.5567	108.1597	152.2494	-12.1147	157.3993	383.4901	1513.1396
0.3403	70.9	77.1891	109.077	72.5313	108.1948	152.2121	-12.4601	157.3109	384.5335	1514.8415
0.3403	70.9026	77.1936	109.0536	72.5103	108.2078	152.1982	-12.4392	156.1142	382.8728	1516.3686
0.3405	70.906	77.1893	109.0707	72.5328	108.2374	152.1481	-12.4338	157.0344	384.4399	1514.1725
0.3407	70.8827	77.2069	109.0426	72.545	108.1817	152.3469	-12.3341	156.6722	383.6259	1512.9061
0.3407	70.8758	77.2113	109.0087	72.5351	108.1722	152.2228	-12.3443	156.6711	384.6765	1515.5239
0.3408	70.8854	77.2183	109.0297	72.5638	108.1787	152.5986	-12.3188	156.8231	383.6278	1514.4505
0.3409	70.8988	77.2102	109.0438	72.5335	108.1704	152.3181	-12.1806	156.894	383.3379	1514.2366
0.3409	70.879	77.2145	109.0496	72.5278	108.201	152.253	-12.2659	158.0532	382.8863	1514.9412
0.3411	70.8682	77.2203	109.0165	72.5568	108.148	152.3069	-12.5145	157.8363	382.3966	1513.9
0.3411	70.8853	77.2018	109.0218	72.5596	108.1935	152.4537	-12.3545	157.0972	383.7975	1512.8019
0.3412	70.9098	77.1982	109.0263	72.508	108.1804	152.1602	-12.31	157.1046	380.8849	1513.7717
0.3413	70.8712	77.214	109.0491	72.5322	108.1909	152.4022	-12.0296	156.565	384.0144	1513.8909
0.3415	70.9019	77.1979	108.9966	72.557	108.1508	152.4082	-11.8396	157.2081	383.3878	1514.0603
0.3416	70.8963	77.1976	109.0541	72.5593	108.2079	152.3409	-12.0252	157.3215	383.114	1512.0663
0.3417	70.8924	77.214	109.0689	72.5284	108.1704	152.4565	-12.2764	157.0381	383.7034	1514.7095
0.3418	70.9006	77.1941	108.9964	72.5466	108.1556	152.2354	-12.1626	157.5739	383.3269	1514.2286
0.3419	70.9118	77.2282	109.0488	72.5616	108.2105	152.5224	-11.9432	156.9161	382.8617	1515.006
0.342	70.9192	77.1949	109.0436	72.5333	108.2053	152.3469	-12.3036	156.7313	382.1474	1513.7557
0.3421	70.9071	77.2084	109.0376	72.5351	108.2106	152.6342	-12.668	157.1801	383.2041	1510.648
0.3424	70.9047	77.2278	109.0442	72.5566	108.1981	152.4094	-12.5011	157.1059	383.1723	1513.7836
0.3426	70.9176	77.2164	109.0104	72.5636	108.1618	152.3232	-12.3865	157.1165	383.4742	1513.9599
0.3429	70.9172	77.2183	109.0132	72.5687	108.21	152.4834	-12.1825	157.4372	383.6923	1515.3106
0.343	70.9274	77.2091	109.0304	72.5596	108.1698	152.0202	-12.1632	157.8482	383.7973	1513.6532
0.343	70.9233	77.227	109.0604	72.5351	108.2271	152.4806	-12.5448	157.1563	383.8031	1511.231
0.3432	70.909	77.2102	109.0408	72.5432	108.2201	152.3868	-12.8346	155.7077	382.6458	1513.3068
0.3432	70.9125	77.2381	109.0652	72.5535	108.1974	152.8367	-12.9206	155.8404	383.0505	1513.8832
0.3433	70.9056	77.224	109.0668	72.5503	108.1919	152.3756	-12.6517	156.1585	383.0081	1514.8722
0.3435	70.9008	77.241	109.0308	72.5527	108.1966	152.7426	-12.6069	157.3427	382.5102	1514.0366
0.3436	70.891	77.2288	109.0387	72.551	108.1829	152.7497	-13.1574	157.1766	383.3259	1514.0672
0.3439	70.8761	77.2261	108.998	72.5584	108.159	152.691	-12.6972	157.2685	383.9191	1513.8986
0.344	70.8718	77.2468	109.0009	72.523	108.1601	152.5642	-12.398	157.2672	383.2715	1512.3611
0.3441	70.8776	77.2398	109.043	72.548	108.1849	152.7292	-12.5227	159.0041	382.4732	1512.7409
0.3442	70.8894	77.2415	109.0383	72.5458	108.1975	152.7519	-12.6286	156.8755	383.3712	1513.8759
0.3443	70.8792	77.2439	109.035	72.5545	108.2056	152.7621	-13.1138	156.9009	382.7274	1513.6609
0.3444	70.8937	77.2632	109.042	72.5421	108.1982	153.1931	-12.6563	156.6958	383.5695	1514.1976
0.3447	70.9346	77.2636	109.0433	72.5202	108.215	152.6451	-12.7321	157.2044	383.2549	1514.1805
0.3449	70.9464	77.2257	109.0533	72.5329	108.206	152.6626	-13.1834	158.7744	384.0144	1512.7793
0.345	70.922	77.2378	108.9777	72.5769	108.1652	152.7932	-13.07	156.611	382.4997	1514.9489
0.345	70.9215	77.2303	109.0413	72.5897	108.1704	152.8457	-13.0241	157.2783	383.3656	1511.792
0.3451	70.9235	77.2563	109.044	72.5588	108.181	152.6244	-12.6521	157.6078	384.4329	1512.3193
0.3452	70.9117	77.23	108.9864	72.5857	108.193	152.6866	-12.2903	157.3427	382.4414	1513.2852
0.3454	70.9233	77.2295	109.0265	72.5414	108.2057	152.5782	-12.3423	158.3907	383.0168	1513.7236
0.3455	70.9512	77.2598	109.093	72.5478	108.2572	153.1894	-12.9623	157.9065	383.2272	1512.2649

0.3457	70.9356	77.2545	109.019	72.5695	108.7058	152.8949	-13.0103	155.922	382.4021	1512.4172
0.3457	70.9257	77.2464	109.0416	72.5905	108.1738	153.0287	-13.2082	158.5163	383.596	1513.5536
0.3459	70.9195	77.2512	109.0441	72.5491	108.2259	152.9014	-13.2668	156.9198	382.5129	1512.2889
0.3459	70.9249	77.2641	109.0478	72.5656	108.1894	153.064	-12.8157	157.7735	383.2715	1513.3149
0.346	70.9098	77.2476	109.0659	72.5712	108.2101	152.7372	-12.5336	157.4806	382.5791	1512.4419
0.3461	70.9296	77.2551	109.0209	72.5476	108.1844	152.8341	-12.2738	156.36	381.8535	1513.6609
0.3461	70.8769	77.2545	109.0378	72.5478	108.207	153.0622	-12.7863	157.6626	382.3246	1511.5516
0.3463	70.8905	77.2478	109.0149	72.561	108.2168	152.9931	-12.7656	158.3785	382.2454	1511.8899
0.3464	70.9012	77.261	109.0851	72.5054	108.2173	153.0695	-13.0043	158.1734	382.5791	1512.2809
0.3466	70.8895	77.2858	109.0395	72.5591	108.1909	153.0553	-13.0665	157.7846	382.9551	1513.7912
0.3468	70.9056	77.2483	109.0657	72.5149	108.2243	153.4356	-13.2351	156.7064	382.6268	1513.3772
0.3469	70.9037	77.2488	109.0131	72.5664	108.1885	153.114	-12.8827	157.622	382.8016	1512.6643
0.3472	70.8771	77.2758	109.0246	72.5756	108.212	153.1904	-12.5647	158.2441	382.5314	1514.1669
0.3474	70.9113	77.2787	109.0365	72.5772	108.1681	152.9711	-12.7108	157.5592	382.6956	1512.6737
0.3476	70.892	77.2639	109.0167	72.5896	108.1657	153.3121	-12.8472	157.6644	382.9922	1513.7606
0.3478	70.9438	77.2728	109.0157	72.5815	108.1749	153.3269	-12.8703	157.8289	382.1253	1514.3728
0.348	70.955	77.2891	109.0418	72.557	108.2085	153.456	-12.9188	158.6604	383.0445	1513.7958
0.3482	70.9333	77.2904	109.0134	72.5843	108.1876	153.3223	-12.9557	157.0455	383.277	1515.0942
0.3483	70.9274	77.2724	109.0656	72.5808	108.1786	153.2037	-13.0363	157.4912	383.4954	1513.6226
0.3485	70.9325	77.282	108.9718	72.5879	108.1435	153.4644	-12.9212	158.2835	383.6148	1512.0164
0.3486	70.9198	77.2746	109.0012	72.6081	108.1911	153.1522	-12.8414	158.6542	383.4689	1513.1396
0.3487	70.9187	77.2861	109.0802	72.5807	108.1741	153.2303	-13.0794	158.217	383.0057	1563.216
0.3488	70.9343	77.2889	109.3591	72.438	108.2949	153.8155	-13.8442	158.5496	382.2139	1567.3117
0.3489	70.9276	77.2873	109.371	72.4518	108.328	153.4081	-13.1532	157.2155	382.9657	1598.5519
0.349	70.9471	77.294	109.4371	72.3949	108.3302	152.4314	-13.0404	157.8215	381.6214	1674.7122
0.3491	70.8954	77.3087	109.4536	72.3747	108.3577	153.1397	-13.1694	158.1734	382.7698	1722.772
0.3493	70.9085	77.309	109.4682	72.401	108.3839	153.7319	-12.1758	157.7366	383.4874	1815.9519
0.3494	70.8978	77.3014	109.5409	72.3024	108.3683	153.5245	-12.4842	157.9613	382.2984	1907.6341
0.3495	70.9055	77.2957	109.5846	72.2743	108.42	152.7937	-11.6545	157.6626	382.6735	1988.7225
0.3496	70.9246	77.3046	109.5929	72.2572	108.4107	151.8016	-11.4024	157.6035	382.1087	2031.1057
0.3497	70.904	77.3197	109.6793	72.2283	108.4707	152.3285	-11.2169	157.9684	382.9499	2116.1933
0.3498	70.9315	77.2912	109.7023	72.1848	108.4876	151.9158	-11.3825	158.6678	383.5982	2158.0468
0.3499	70.9313	77.3299	109.6982	72.1986	108.4439	152.3507	-11.2984	157.0776	382.7539	2165.3356
0.35	70.8935	77.3118	109.7759	72.1932	108.4783	151.5285	-10.4986	158.8415	382.7233	2201.9288
0.3501	70.902	77.3226	109.8962	72.1119	108.5844	150.8251	-9.8731	158.4067	382.8598	2243.1198
0.3502	70.9186	77.3172	109.9327	72.0978	108.6064	151.5883	-9.1947	158.9087	382.1978	2306.9511
0.3503	70.9289	77.2982	110.0479	72.0514	108.6544	151.5172	-8.9128	158.8592	383.845	2341.4503
0.3504	70.9139	77.3092	110.0983	72.0234	108.6778	150.985	-8.7236	157.6552	382.7953	2380.3261
0.3505	70.942	77.3041	110.1725	71.9739	108.7019	149.7588	-8.5987	158.3205	383.6702	2428.5842
0.3505	70.9305	77.336	110.2591	71.993	108.7257	151.3139	-9.3156	157.5111	381.9038	2442.4582
0.3506	70.9359	77.337	110.3689	71.9189	108.7884	151.8709	-9.2114	158.3749	383.6225	2469.0592
0.3507	70.9479	77.3099	110.349	71.9377	108.7396	151.3164	-9.1134	157.6432	382.6268	2523.522
0.3508	70.9435	77.3108	110.451	71.8768	108.8123	150.1351	-9.5666	158.0396	383.6259	2552.9045
0.3509	70.9545	77.3344	110.4395	71.8932	108.7883	149.7022	-9.7233	158.9117	383.9304	2599.8082
0.3509	70.9399	77.3482	110.4489	71.9149	108.8011	150.9006	-9.9527	158.184	382.7645	2610.1074
0.3511	70.9193	77.335	110.5263	71.896	108.7946	150.6731	-9.8905	157.8235	384.0144	2560.5588
0.3512	70.9216	77.3245	110.5303	71.9014	108.7486	151.3092	-9.648	158.1652	382.308	2561.721
0.3513	70.9353	77.323	110.5892	71.9052	108.7574	150.4277	-9.3926	158.945	382.8507	2559.557
0.3514	70.9185	77.3265	110.5601	71.9113	108.7157	151.1848	-8.6084	158.4313	382.3468	2553.3293
0.3514	70.9157	77.3192	110.6012	71.894	108.7495	152.6048	-8.6094	158.6895	383.5378	2528.4132
0.3515	70.9195	77.3174	110.6624	71.8954	108.7879	152.3942	-8.9094	157.4816	383.0611	2525.2609
0.3516	70.9396	77.3382	110.6542	71.8869	108.7617	150.921	-8.5627	157.4028	383.4477	2528.9575
0.3516	70.9394	77.35	110.6354	71.9215	108.7233	152.3627	-9.4295	159.3885	382.7344	2524.6197

0.3517	70.9129	77.3388	110.7405	71.8651	108.7782	151.8582	-8.9958	157.7994	382.5129	2525.3971
0.3518	70.9179	77.3287	110.7403	71.9038	108.7423	150.5869	-8.8613	158.4279	383.8979	2526.1976
0.3518	70.9014	77.3451	110.7099	71.9259	108.7627	152.3376	-9.3247	157.925	383.2217	2528.8596
0.3519	70.9066	77.3102	110.7634	71.8833	108.7725	150.5709	-8.9235	157.6644	382.6691	2526.9719
0.352	70.8768	77.317	110.7588	71.9104	108.732	150.9886	-8.7481	157.5654	382.5844	2524.7256
0.352	70.8993	77.3405	110.8097	71.9381	108.722	150.9581	-8.9124	159.0411	382.9226	2524.0506
0.3521	70.9073	77.3459	110.8335	71.8781	108.7534	150.6385	-9.1704	158.3537	382.3468	2527.1284
0.3523	70.9129	77.3515	110.894	71.9192	108.7737	151.7941	-9.2058	159.4254	381.9758	2524.9243
0.3524	70.9196	77.3645	110.9426	71.8972	108.7982	151.1174	-9.067	158.5799	382.7645	2526.9872
0.3526	70.8968	77.3584	111.0171	71.9067	108.7538	152.0645	-9.2944	158.3537	382.7621	2527.0803
0.3527	70.8861	77.336	110.962	71.9097	108.76	150.1373	-9.0325	158.5022	382.8651	2525.7989
0.3528	70.9401	77.3533	111.0109	71.9179	108.773	151.1423	-8.98	158.5057	382.8016	2525.3236
0.3528	70.9195	77.3556	111.1184	71.8694	108.8452	150.8392	-9.1724	158.0507	383.122	2527.4089
0.353	70.9241	77.3449	111.1275	71.8454	108.8141	151.9103	-9.1511	157.4483	382.4409	2526.4471
0.3531	70.9257	77.3487	111.1035	71.9121	108.8272	151.1192	-9.1149	158.0002	383.5907	2526.2896
0.3532	70.9458	77.3309	111.1601	71.8914	108.8141	152.5995	-9.0506	158.8009	381.6823	2526.1425
0.3533	70.9289	77.364	111.1609	71.8899	108.8174	151.2116	-8.8019	158.6471	382.9551	2530.5828
0.3534	70.9445	77.3576	111.1858	71.8742	108.8374	151.6381	-9.2931	157.6072	382.3302	2526.0303
0.3534	70.9407	77.3309	111.1194	71.9062	108.811	152.9507	-9.3865	159.0596	382.3357	2528.3226
0.3535	70.9418	77.3574	111.135	71.8928	108.8011	150.6873	-8.8882	158.0356	382.5844	2527.3859
0.3536	70.9423	77.375	111.1935	71.9085	108.7997	152.5106	-9.1649	157.2862	382.1978	2523.844
0.3536	70.952	77.3421	111.1398	71.8886	108.7837	152.0227	-9.3009	158.5163	384.2848	2525.846
0.3537	70.9394	77.3551	111.2003	71.9324	108.8092	151.1522	-8.8615	158.9117	385.1929	2525.4853
0.3538	70.9459	77.3459	111.1976	71.8786	108.8417	152.6376	-9.2426	158.6531	382.1917	2526.0624
0.3539	70.9401	77.3411	111.2448	71.907	108.851	151.6416	-8.9919	159.1703	382.1819	2524.9786
0.354	70.9348	77.3505	111.2045	71.9085	108.8008	152.8234	-8.8558	158.1431	382.6292	2526.928
0.3541	70.914	77.3686	111.2518	71.8921	108.858	151.4853	-8.9337	159.0748	382.9128	2524.4113
0.3542	70.9218	77.3451	111.3042	71.8671	108.8505	151.7728	-8.9907	159.3404	383.1109	2524.7399
0.3543	70.917	77.3352	111.2729	71.899	108.8693	150.41	-9.1726	158.2392	381.782	2524.3552
0.3543	70.9179	77.353	111.2667	71.8706	108.8153	152.4049	-8.6358	159.8631	383.22	2527.4472
0.3544	70.9049	77.3523	111.2906	71.8559	108.8776	151.0721	-8.6996	158.3855	382.7274	2527.1329
0.3545	70.9279	77.3589	111.3057	71.8942	108.8595	151.0436	-9.141	158.0839	383.5317	2525.1407
0.3545	70.9065	77.3553	111.3278	71.9065	108.864	153.0157	-8.8898	157.149	381.6712	2527.5932
0.3546	70.92	77.3561	111.3193	71.8722	108.863	151.1931	-8.7543	158.4424	381.411	2524.9643
0.3547	70.8919	77.3535	111.4126	71.8778	108.8886	152.0394	-9.1153	158.4202	381.9702	2528.547
0.3548	70.9013	77.356	111.44	71.8713	108.9095	151.7874	-8.3243	159.3329	383.4901	2527.1252
0.3548	70.9241	77.3551	111.4452	71.8345	108.9112	151.6715	-8.9548	159.8985	383.2383	2525.6857
0.3549	70.9215	77.3713	111.4172	71.8676	108.9179	151.4239	-9.6087	159.294	382.8704	2525.4846
0.355	70.9308	77.3693	111.4447	71.8646	108.9157	152.1295	-8.8683	158.8268	383.205	2527.489
0.3551	70.9191	77.3591	111.4557	71.8701	108.9156	151.8736	-9.4342	158.1982	382.9499	2526.0059
0.3552	70.9179	77.3628	111.4163	71.8643	108.8714	152.077	-8.6899	158.6789	382.2295	2526.6882
0.3553	70.9301	77.3774	111.4648	71.8428	108.9175	150.9201	-8.943	158.2371	383.4371	2525.7146
0.3554	70.8955	77.3673	111.4739	71.8867	108.9048	152.9739	-9.6783	159.2813	382.2194	2527.3448
0.3555	70.9017	77.3607	111.4373	71.8877	108.9359	152.0747	-8.812	158.2355	382.2416	2525.4693
0.3555	70.9384	77.3719	111.3967	71.9076	108.9254	151.3297	-8.7132	159.4513	382.1474	2524.5876
0.3556	70.9079	77.3528	111.3136	71.9257	108.8742	153.0909	-9.2612	159.3152	382.5314	2526.3356
0.3557	70.9159	77.3749	111.3208	71.9044	108.9198	151.6567	-9.1867	158.5422	383.0998	2529.3726
0.3557	70.9259	77.366	111.4597	71.8693	108.8956	151.24	-8.6611	157.8376	381.6681	2526.1593
0.3558	70.9382	77.3691	111.4136	71.8687	108.9172	152.4463	-9.1851	158.3168	384.0633	2526.0784
0.3559	70.9305	77.3665	111.3652	71.8577	108.8913	150.8336	-8.7705	158.3205	382.0312	2526.2467
0.3559	70.9586	77.3844	111.4763	71.8457	108.9398	152.0487	-9.016	158.6678	382.8839	2525.862
0.356	70.9157	77.3679	111.4521	71.8567	108.9312	151.9242	-9.0086	159.0466	381.8535	2525.8679
0.3561	70.9194	77.3789	111.5091	71.8269	108.9331	151.4924	-9.1042	158.7213	383.4265	2525.1396

0.3561	70.9481	77.3714	111.5524	71.8543	109.0035	153.2805	-8.9945	158.9265	382.6569	2526.1425
0.3564	70.9352	77.3728	111.5573	71.9189	108.8963	152.3729	-9.425	159.2445	382.8439	2528.4132
0.3565	70.9119	77.3785	111.5161	71.8811	108.8944	152.9572	-9.0934	158.8748	382.596	2525.2368
0.3566	70.924	77.403	111.5439	71.8598	108.9439	152.1677	-8.6115	159.8702	382.0018	2527.4012
0.3566	70.9545	77.3574	111.4792	71.8896	108.9528	152.7863	-9.3718	159.7507	382.7731	2526.2067
0.3567	70.9367	77.3937	111.4693	71.8718	108.9317	152.0655	-9.1751	159.2905	382.7486	2524.603
0.3568	70.9467	77.3818	111.6088	71.8551	108.9561	151.5306	-9.2341	159.0218	381.8217	2527.5316
0.3569	70.9169	77.3837	111.5012	71.8847	108.9635	153.3059	-9.3558	159.8419	381.7899	2526.0213
0.357	70.9318	77.3729	111.5675	71.8875	108.9809	153.5777	-9.177	158.9635	383.277	2525.2609
0.3571	70.9489	77.3925	111.6323	71.8667	108.9504	154.2382	-9.2757	160.4565	381.7543	2524.243
0.3572	70.9345	77.394	111.6638	71.8574	108.9199	153.0758	-9.6549	158.032	381.631	2525.8679
0.3573	70.9029	77.3798	111.7446	71.861	108.9624	153.2721	-9.265	159.4439	382.8064	2526.8078
0.3574	70.9228	77.3701	111.6616	71.8722	108.9489	153.4045	-9.1125	159.5344	382.9604	2526.7956
0.3576	70.9081	77.3969	111.5827	71.9116	109.0019	153.3095	-9.1447	158.2371	383.7496	2525.1856
0.3576	70.9027	77.394	111.5823	71.9062	108.9679	152.3107	-9.0395	158.0709	380.6141	2524.557
0.3577	70.9086	77.3779	111.6327	71.8769	108.9703	152.9212	-9.312	160.305	383.6702	2525.1779
0.3578	70.9245	77.384	111.6914	71.8512	109.0243	153.2339	-9.3074	160.1141	382.2613	2525.0629
0.3579	70.9295	77.3604	111.7024	71.8564	109.0431	152.7435	-9.0451	158.6826	381.4719	2525.5574
0.358	70.9218	77.3986	111.659	71.8632	109.0398	153.3919	-9.3157	159.3737	382.895	2527.0001
0.358	70.8978	77.3976	111.6478	71.9105	109.0236	152.4156	-9.0395	159.9428	382.1862	2523.9705
0.3582	70.9179	77.3896	111.6907	71.8969	109.0475	151.7332	-9.1267	159.2092	382.6638	2526.2129
0.3584	70.9433	77.3946	111.7804	71.8566	109.0058	152.946	-9.3845	159.7507	382.2914	2526.3429
0.3585	70.9196	77.3889	111.8314	71.8742	109.018	151.8114	-8.9608	159.1173	381.8058	2526.5273
0.3586	70.9165	77.3933	111.7741	71.8298	109.0045	152.3552	-8.724	159.8578	383.7865	2527.5612
0.3587	70.9246	77.3912	111.8009	71.898	108.9887	152.3255	-9.0441	159.0633	382.2139	2528.1463
0.3588	70.9374	77.3774	111.8158	71.8754	109.0312	152.229	-8.8269	159.3435	381.7105	2525.9983
0.3589	70.9196	77.401	111.8036	71.8581	109.0334	152.0139	-8.984	159.9126	381.5092	2525.6916
0.359	70.9259	77.3849	111.8197	71.8558	109.0351	152.1453	-8.9113	159.4993	382.906	2525.2689
0.3591	70.9109	77.4131	111.817	71.8735	109.0073	152.1778	-9.1169	159.1261	383.0611	2524.7399
0.3592	70.9103	77.3772	111.7722	71.9165	109.0139	152.1828	-9.0534	159.7465	383.4689	2525.8833
0.3593	70.9045	77.3884	111.802	71.876	109.0294	152.2281	-9.0119	159.195	381.0378	2526.8492
0.3594	70.9435	77.3884	111.8204	71.8532	109.0718	151.4008	-9.142	159.4389	383.1723	2525.6993
0.3595	70.9218	77.3691	111.8401	71.8684	109.0387	153.5165	-9.5969	159.5945	381.1755	2522.4027
0.3595	70.9275	77.394	111.7989	71.8985	109.0294	151.0092	-8.9885	159.843	383.0445	2526.2948
0.3596	70.9195	77.3963	111.7428	71.9205	109.0208	151.1996	-8.8725	159.5807	382.1862	2527.6654
0.3597	70.9506	77.4125	111.8027	71.8767	109.0444	150.961	-8.6766	159.7217	382.3143	2527.8689
0.3598	70.9396	77.404	111.8062	71.8876	109.0336	152.6448	-9.3767	159.3329	382.8386	2526.1899
0.3599	70.9274	77.3869	111.8149	71.894	109.0303	153.648	-9.2758	159.6793	382.7168	2527.2862
0.36	70.9384	77.3948	111.8089	71.878	109.0569	152.3162	-8.9126	158.5718	382.3302	2528.2745
0.3601	70.94	77.3938	111.7791	71.914	109.0346	152.6367	-9.4346	158.6752	382.679	2526.7597
0.3602	70.9443	77.4062	111.8194	71.9035	109.0204	152.9096	-8.9724	158.6754	383.0293	2526.6269
0.3603	70.9391	77.4035	111.794	71.8971	109.0646	152.1837	-9.0598	159.0041	382.4732	2526.0136
0.3605	70.9423	77.4266	111.7621	71.9146	108.9925	151.6622	-8.6338	158.8489	382.081	2527.4169
0.3605	70.9251	77.3765	111.8057	71.8875	109.0336	152.3682	-9.3416	159.5104	382.5461	2525.4613
0.3606	70.9772	77.383	111.8173	71.8793	109.0566	152.4307	-8.624	158.6471	383.2835	2526.0213
0.3607	70.9472	77.4066	111.8187	71.8735	109.0509	152.0424	-8.9401	159.3859	382.0336	2526.2359
0.3608	70.966	77.4132	111.8904	71.8928	109.0771	151.5714	-8.7625	160.0081	382.1077	2524.4726
0.3609	70.9479	77.4042	111.8533	71.8977	109.0662	153.0454	-8.9012	159.5474	382.5074	2525.4212
0.361	70.9572	77.3752	111.8691	71.871	109.0389	153.2046	-8.9756	159.6298	381.4562	2525.9063
0.3611	70.9328	77.3923	111.8494	71.8925	109.0648	153.026	-9.1206	159.188	382.9287	2527.3552
0.3612	70.9392	77.4159	111.8758	71.8926	109.1038	153.9298	-9.0998	158.897	381.638	2524.2029
0.3613	70.9433	77.4251	111.8744	71.9038	109.0597	153.4347	-8.6766	160.013	382.5461	2526.1345
0.3614	70.9405	77.4274	111.8506	71.9	109.0685	151.3882	-9.7129	159.1039	381.865	2526.4792

0.3614	70.9477	77.412	111.8377	71.8952	109.0435	153.7137	-9.0525	159.5521	384.2952	2525.1013
0.3615	70.9367	77.4303	111.8864	71.8496	109.0682	151.0516	-8.7917	159.0253	381.6999	2523.4607
0.3616	70.941	77.4254	111.8586	71.8955	109.0364	151.6817	-9.3992	159.152	383.2992	2524.5235
0.3616	70.914	77.4222	111.8556	71.894	109.0302	152.8678	-9.2556	159.6192	382.1395	2525.5689
0.3617	70.9185	77.4157	111.8591	71.8959	109.0469	151.4421	-8.4105	160.0759	382.2803	2527.9138
0.3618	70.9264	77.3752	111.8305	71.8949	109.0359	152.1555	-9.3747	158.4313	381.8823	2524.8762
0.3618	70.9514	77.4132	111.836	71.8959	109.073	152.6484	-8.9044	159.9268	382.2136	2525.4079
0.3619	70.9234	77.4052	111.899	71.8778	109.0893	151.1132	-9.5827	159.4254	382.4907	2526.4471
0.362	70.9445	77.4186	111.8017	71.927	109.0363	152.3951	-8.6135	159.0218	380.7094	2527.7462
0.362	70.9507	77.4274	111.831	71.8954	109.0438	151.8852	-8.7455	161.373	383.4985	2525.878
0.3621	70.9497	77.4111	111.8844	71.863	109.0848	151.7059	-10.2831	159.1667	382.0478	2526.5353
0.3622	70.9249	77.4119	111.8318	71.9345	109.0346	152.8699	-8.4311	159.1483	383.0555	2525.5494
0.3623	70.9557	77.42	111.8605	71.894	109.0447	152.0717	-10.3426	159.6581	382.3619	2526.3279
0.3624	70.952	77.4287	111.8317	71.8885	109.0271	152.8968	-8.5493	159.928	382.2139	2525.2128
0.3625	70.9575	77.4266	111.8484	71.8818	109.0326	152.7586	-8.0615	158.5163	381.8747	2527.6082
0.3625	70.9614	77.4432	111.861	71.8596	109.0413	152.1964	-9.0541	159.588	382.0201	2524.3632
0.3626	70.9567	77.4356	111.8832	71.861	109.0699	152.1472	-10.3923	159.0854	383.0081	2524.5953
0.3627	70.965	77.4196	111.8564	71.8899	109.0622	153.919	-8.3936	159.6051	383.453	2524.327
0.3627	70.9592	77.4259	111.8048	71.9228	109.0106	151.4657	-8.2795	158.7814	382.4308	2528.2369
0.3628	70.9511	77.43	111.8187	71.9174	109.0389	153.1522	-10.3807	159.4566	382.2878	2525.3849
0.3629	70.9405	77.4274	111.828	71.8744	109.091	151.6418	-9.7575	160.9074	381.8097	2522.5999
0.363	70.9313	77.3979	111.8268	71.9115	109.0597	152.4472	-7.9656	159.662	381.7986	2526.3189
0.363	70.931	77.4231	111.8573	71.866	109.0978	153.4774	-9.7154	159.6546	382.308	2524.5155
0.3631	70.9594	77.4386	111.8784	71.8824	109.1214	151.9103	-10.1004	159.9687	381.3999	2523.8102
0.3632	70.9461	77.4203	111.8781	71.9076	109.0986	151.6288	-8.4162	159.7987	383.1995	2526.8639
0.3633	70.9516	77.4256	111.895	71.895	109.0936	153.2686	-9.5642	158.8592	382.9446	2524.1276
0.3634	70.9463	77.4231	111.9363	71.8571	109.1041	153.6976	-9.4122	159.6139	382.8673	2525.6696
0.3634	70.946	77.4347	111.869	71.9101	109.0797	152.3347	-8.3261	159.4672	381.7581	2524.212
0.3635	70.9377	77.4118	111.8417	71.936	109.1075	153.5431	-9.148	159.8737	382.9181	2523.7826
0.3636	70.9374	77.4164	111.8829	71.8829	109.1322	152.8563	-10.1933	159.8207	382.1342	2525.7376
0.3636	70.9406	77.4512	111.8726	71.882	109.0977	152.0113	-7.6982	159.0713	383.0611	2525.4693
0.3637	70.9456	77.435	111.8109	71.9261	109.0765	153.7468	-8.4305	159.4883	382.596	2525.2609
0.3638	70.9484	77.4429	111.8651	71.9021	109.1483	152.8764	-10.372	159.2333	381.5937	2526.944
0.3639	70.943	77.4325	111.8784	71.8671	109.1415	153.5917	-8.3728	159.4735	381.5107	2525.8139
0.3639	70.9482	77.4296	111.8802	71.8677	109.1292	153.4605	-8.2385	160.3934	382.9446	2526.9336
0.364	70.9506	77.4247	111.9242	71.8588	109.1637	153.8888	-10.5674	158.8875	382.5102	2523.522
0.3641	70.9519	77.4502	111.8288	71.913	109.0898	153.0429	-8.2419	160.0081	381.6204	2527.2709
0.3641	70.9458	77.4276	111.8485	71.9158	109.0965	154.4305	-8.0744	159.5659	383.1774	2526.367
0.3642	70.9361	77.4434	111.8528	71.8946	109.1109	154.5884	-10.3281	160.0352	382.1308	2525.6135
0.3643	70.9285	77.4358	111.8862	71.8469	109.1141	152.0199	-8.4366	160.0352	382.1142	2523.8983
0.3643	70.9545	77.4237	111.7995	71.893	109.0629	154.4441	-8.1092	159.5485	382.7592	2525.2009
0.3644	70.9467	77.4573	111.8247	71.8747	109.0953	154.055	-9.7822	159.6899	382.399	2525.6149
0.3645	70.9386	77.4346	111.888	71.8634	109.1418	151.8185	-9.1162	159.7359	383.7337	2524.7103
0.3645	70.9295	77.4266	111.856	71.9081	109.1166	154.9925	-7.7982	160.1941	382.1474	2522.5037
0.3646	70.956	77.4251	111.8001	71.9022	109.1058	153.0789	-9.2599	160.0093	382.4354	2528.6432
0.3647	70.9479	77.417	111.8926	71.8765	109.1056	151.9316	-9.8152	159.455	381.9869	2526.3549
0.3648	70.9455	77.4317	111.799	71.9023	109.0912	153.4943	-8.2698	159.1526	383.0452	2527.3016
0.3648	70.9589	77.433	111.8014	71.9291	109.084	152.2547	-8.6839	160.2944	382.5102	2528.6049
0.3649	70.9382	77.4429	111.849	71.8984	109.1146	152.4193	-11.0027	158.4794	382.8507	2524.4594
0.365	70.9335	77.432	111.8683	71.8898	109.1534	152.8883	-8.6822	160.2202	382.4891	2524.051
0.365	70.9451	77.4473	111.809	71.896	109.0746	152.3487	-8.3041	159.6361	381.8373	2526.6154
0.3651	70.9456	77.4325	111.8319	71.8811	109.1126	152.9479	-10.8926	159.4254	382.1807	2528.8756
0.3652	70.9323	77.4381	111.7873	71.9098	109.101	153.6462	-7.7439	159.5521	382.7486	2527.2939

0.3653	70.9142	77.442	111.7474	71.9328	109.0636	152.1686	-9.924	159.9692	382.6056	2525.8449
0.3654	70.9254	77.448	111.7916	71.9319	109.0873	154.0422	-11.1438	160.4417	382.679	2527.9619
0.3655	70.9489	77.4383	111.7392	71.9322	109.07	152.8476	-7.7809	159.0965	381.8263	2523.9544
0.3655	70.955	77.4343	111.7713	71.8832	109.0569	152.0347	-9.4574	159.8911	381.71	2523.0888
0.3656	70.9249	77.4399	111.7949	71.9122	109.1257	153.508	-11.0869	160.0574	381.7709	2526.1025
0.3657	70.9516	77.4597	111.7926	71.9152	109.1279	152.2103	-7.4208	159.7465	381.9117	2525.1166
0.3657	70.9221	77.4422	111.7087	71.9572	109.0519	153.5155	-9.578	158.8194	381.8816	2525.7258
0.3658	70.9338	77.4663	111.7576	71.9284	109.0953	152.4369	-10.7293	159.0466	381.8959	2527.3552
0.3659	70.9328	77.4503	111.7515	71.9293	109.0647	153.26	-8.3085	159.965	381.7654	2527.3929
0.3659	70.9308	77.4342	111.6865	71.9733	109.0458	154.0647	-8.8015	160.7398	382.4361	2524.856
0.366	70.9152	77.4429	111.7072	71.9479	109.0905	152.3214	-9.7055	160.2308	381.8641	2525.3389
0.3661	70.9264	77.4566	111.7542	71.9152	109.1207	153.1975	-9.3626	160.0858	382.2189	2526.9719
0.3661	70.9394	77.45	111.7388	71.9508	109.0525	154.2353	-8.3619	159.8808	381.8217	2527.4242
0.3662	70.9336	77.418	111.7741	71.914	109.1149	151.8917	-8.975	160.1387	382.906	2525.7017
0.3663	70.9274	77.4454	111.839	71.8991	109.1456	153.919	-10.2642	159.5379	382.7486	2527.1559
0.3664	70.9333	77.4355	111.8024	71.902	109.1131	154.711	-7.9717	160.1313	381.865	2528.523
0.3664	70.9401	77.4459	111.8057	71.9115	109.1171	153.0544	-8.9833	159.8278	382.934	2527.3246
0.3665	70.9015	77.4683	111.7563	71.9223	109.0845	154.4042	-10.656	159.8278	383.0346	2526.1363
0.3666	70.9354	77.4554	111.7224	71.938	109.0757	152.6674	-7.7903	162.4152	381.7598	2526.5353
0.3666	70.9287	77.4734	111.6753	71.9765	109.0393	154.2504	-8.3605	161.171	381.5463	2526.4889
0.3667	70.9446	77.4569	111.7933	71.9056	109.1492	154.3441	-10.9669	160.4196	382.0422	2525.4853
0.3668	70.9461	77.4686	111.8212	71.9135	109.1319	152.7482	-7.714	160.1498	382.6015	2526.4231
0.3668	70.9328	77.4556	111.7237	71.9526	109.0566	154.4637	-8.2283	160.1035	380.4552	2527.0179
0.3669	70.9291	77.4641	111.7487	71.9267	109.084	153.855	-10.4751	162.2457	382.881	2524.327
0.367	70.9201	77.477	111.7659	71.954	109.1157	152.7106	-8.496	159.6828	381.8641	2528.1602
0.367	70.9254	77.4582	111.7111	71.9495	109.0694	154.1955	-7.7956	160.1202	381.2116	2525.8941
0.3671	70.9341	77.4643	111.7194	71.9477	109.1103	153.7282	-10.2441	160.7189	381.7764	2526.5914
0.3672	70.9287	77.4666	111.8525	71.8943	109.1858	153.653	-8.9888	160.7522	381.6768	2525.4212
0.3673	70.9264	77.4444	111.7952	71.9325	109.1425	153.2464	-7.8112	160.1565	382.0547	2524.8943
0.3673	70.9318	77.4668	111.7311	71.943	109.1288	154.6156	-9.8133	160.0116	381.6045	2526.6806
0.3674	70.9162	77.4643	111.8537	71.8981	109.2172	153.8035	-9.8181	159.2	382.0533	2527.9379
0.3675	70.9299	77.4405	111.7712	71.9203	109.1617	154.7471	-8.0724	159.3718	381.7952	2528.1755
0.3675	70.9242	77.4544	111.7409	71.9493	109.0893	154.92	-9.7222	160.2791	381.7045	2526.2307
0.3676	70.9336	77.4511	111.8442	71.8808	109.1876	152.6952	-9.974	159.747	381.7377	2526.407
0.3677	70.9142	77.4542	111.7623	71.9235	109.1193	155.1648	-8.2074	159.9656	381.3609	2525.1933
0.3678	70.9446	77.4722	111.7164	71.96	109.0847	154.1035	-11.5558	160.6819	381.9758	2525.1887
0.3678	70.9372	77.4801	111.7287	71.9061	109.1146	154.6934	-8.0827	160.6819	381.9481	2525.9181
0.368	70.912	77.469	111.7676	71.9215	109.1533	154.5872	-11.6384	160.3333	382.1024	2525.1856
0.3681	70.9184	77.4632	111.7751	71.9218	109.1368	153.4232	-7.9605	159.8985	382.3461	2523.499
0.3682	70.9226	77.4707	111.7138	71.9344	109.1424	154.1193	-10.8502	160.1572	382.2969	2526.5834
0.3683	70.9108	77.4702	111.7216	71.9553	109.1601	153.7822	-8.736	159.7712	382.1024	2525.5843
0.3684	70.9155	77.4839	111.6835	71.9623	109.0895	153.9502	-9.1055	160.7595	383.1386	2526.5192
0.3684	70.8958	77.4694	111.761	71.9314	109.167	153.1541	-10.6835	159.8209	383.2936	2527.3127
0.3685	70.9196	77.4644	111.7378	71.967	109.1572	154.6698	-9.0694	160.1742	383.7708	2527.2709
0.3686	70.9162	77.449	111.6499	71.9612	109.1161	153.4142	-8.5546	160.6967	384.1851	2526.5753
0.3686	70.9438	77.4885	111.7959	71.882	109.1984	152.7532	-10.9458	159.8702	383.1352	2527.2172
0.3687	70.9277	77.486	111.7292	71.9245	109.1753	153.7161	-9.3415	160.1941	383.3546	2525.1166
0.3688	70.9423	77.4648	111.6487	71.9396	109.0999	152.6655	-8.3355	160.8076	382.8064	2526.7998
0.3689	70.9088	77.4595	111.7387	71.9214	109.1246	153.495	-10.7122	160.8409	381.4165	2526.3349
0.3689	70.9301	77.4968	111.7324	71.8979	109.1493	152.7203	-9.9965	159.8419	381.2391	2525.8449
0.369	70.9538	77.479	111.6213	71.985	109.0837	152.9514	-8.3684	159.8879	381.5569	2526.9412
0.3691	70.9331	77.4709	111.6417	71.9707	109.1304	154.385	-10.3834	161.155	381.8097	2528.2905
0.3691	70.9421	77.4722	111.7093	71.9037	109.1694	152.4325	-11.1766	160.1424	383.3259	2527.0562

0.3692	70.9517	77.4895	111.6231	71.9824	109.1244	154.0738	-8.1312	161.1365	381.3113	2527.1123
0.3693	70.9379	77.4936	111.6933	71.9824	109.1495	154.7872	-10.0043	160.9406	381.6657	2524.9162
0.3693	70.926	77.4878	111.7736	71.9228	109.2097	153.2206	-11.8685	160.9696	382.7062	2527.1176
0.3694	70.9231	77.4737	111.6921	71.971	109.1558	153.9567	-7.9373	159.6287	382.0256	2527.0482
0.3695	70.9135	77.4802	111.6815	71.9511	109.1224	154.2851	-9.4958	160.556	382.4573	2527.1712
0.3695	70.9183	77.4816	111.7109	71.9212	109.1846	153.6855	-11.9059	160.5009	382.1031	2526.3189
0.3696	70.9147	77.4832	111.7086	71.9317	109.1598	153.0482	-7.9024	159.8726	382.4631	2524.2189
0.3697	70.94	77.4549	111.6575	71.9638	109.1462	152.6005	-10.9509	160.2643	382.1807	2524.3231
0.3699	70.9323	77.488	111.6477	71.9539	109.1389	152.5419	-7.4865	159.5585	381.6214	2527.5612
0.3699	70.9328	77.5019	111.711	71.9323	109.2023	152.9611	-11.1255	160.054	382.4573	2528.1602
0.3701	70.9221	77.4765	111.6688	71.9455	109.1817	151.9926	-7.3962	160.2025	381.6469	2527.3016
0.3701	70.9052	77.4744	111.6771	71.9589	109.2068	153.3912	-10.9133	160.3474	382.3302	2528.2445
0.3702	70.9336	77.4893	111.664	71.9526	109.1653	155.5118	-9.1755	160.3124	381.3667	2526.1986
0.3703	70.9233	77.4924	111.6606	71.9616	109.1807	154.4699	-8.3799	160.2343	382.0918	2524.8406
0.3704	70.9364	77.4768	111.6723	71.938	109.2137	154.4305	-10.7388	159.9502	381.7986	2524.1548
0.3705	70.9185	77.4946	111.7434	71.9185	109.2222	154.8476	-9.2681	160.353	381.5826	2525.9422
0.3705	70.9356	77.5142	111.6815	71.9474	109.1828	153.1727	-8.4827	159.9909	382.3191	2527.1284
0.3706	70.9369	77.4875	111.6578	71.9641	109.1741	154.7853	-10.3204	159.7728	382.1364	2525.5174
0.3707	70.9296	77.4987	111.7505	71.9286	109.2298	154.1856	-9.8998	160.6514	382.3725	2527.2632
0.3707	70.9292	77.49	111.6577	71.9666	109.154	153.8257	-8.1297	161.0182	381.9426	2525.2288
0.3708	70.923	77.497	111.6731	71.9401	109.162	153.9919	-10.1235	160.2131	382.309	2528.8119
0.3709	70.9244	77.5208	111.7447	71.8918	109.2511	154.398	-10.3386	159.8024	381.2283	2525.5655
0.3709	70.9338	77.498	111.615	71.9884	109.1831	154.4166	-8.2653	159.7253	380.6565	2526.5119
0.371	70.9052	77.5109	111.6872	71.9765	109.2001	153.8479	-9.7792	159.6192	381.8641	2526.3049
0.3711	70.9395	77.4977	111.7151	71.9357	109.229	154.6256	-10.5934	161.6761	380.3201	2524.8762
0.3711	70.9614	77.5109	111.651	71.9738	109.1855	153.6142	-8.0399	160.7292	383.9721	2525.6993
0.3712	70.9482	77.5165	111.6174	71.9868	109.1764	154.7426	-9.9914	159.7765	381.5383	2525.9742
0.3713	70.9392	77.5203	111.7086	71.9239	109.2726	153.4755	-10.585	160.9258	382.9891	2524.0186
0.3714	70.9292	77.4824	111.5985	72.0085	109.1274	152.214	-8.109	160.7669	382.2637	2527.8417
0.3714	70.917	77.4753	111.6354	71.9847	109.1793	154.6265	-9.5868	160.6413	381.4276	2529.1001
0.3715	70.9521	77.4797	111.6705	71.935	109.2385	152.6342	-11.0068	160.3156	381.541	2526.0213
0.3716	70.9732	77.5135	111.632	71.9685	109.1834	152.724	-7.4943	160.3161	382.164	2524.1468
0.3716	70.9384	77.4977	111.6333	71.9777	109.1821	154.3722	-9.2679	160.5878	381.5569	2525.5459
0.3717	70.9574	77.5333	111.7151	71.9306	109.2466	152.9386	-11.201	160.6376	382.153	2525.1246
0.3718	70.9721	77.515	111.6143	72.0092	109.2235	153.2433	-7.9778	160.1498	381.9536	2525.5655
0.3718	70.9636	77.5009	111.6534	71.986	109.1999	153.8026	-8.5423	160.2626	382.7274	2525.5383
0.3719	70.9609	77.5114	111.7404	71.9155	109.2694	152.4073	-11.4996	159.5807	382.3191	2526.4872
0.372	70.9453	77.5119	111.6477	71.9753	109.2038	154.7773	-7.9388	160.7963	382.2719	2525.5919
0.372	70.9423	77.5157	111.6028	71.9771	109.1818	152.947	-8.391	160.1978	380.9459	2521.6942
0.3721	70.9594	77.5226	111.7206	71.9388	109.2847	152.5057	-12.1211	160.9517	381.5328	2525.1006
0.3722	70.966	77.5089	111.6138	71.9602	109.2029	154.345	-7.7539	161.5874	382.1585	2527.5051
0.3723	70.9401	77.5189	111.6774	71.9298	109.2455	153.6969	-12.6197	161.0332	380.6459	2526.8109
0.3724	70.965	77.5129	111.6061	71.9881	109.2127	155.5963	-7.6051	160.8076	381.8263	2525.0846
0.3725	70.9406	77.5024	111.6016	72.0114	109.1912	152.5924	-7.8956	161.369	381.9488	2524.5723
0.3725	70.9055	77.5351	111.6622	71.989	109.2563	154.0821	-12.19	159.2628	381.1673	2525.1407
0.3726	70.9421	77.5136	111.5877	71.9801	109.2325	154.3651	-7.9576	160.6762	382.0759	2527.1022
0.3727	70.9582	77.515	111.5392	72.026	109.1816	153.4729	-7.6664	160.2202	381.594	2525.4923
0.3727	70.9591	77.5198	111.5647	71.9868	109.2366	154.4816	-11.3294	160.353	381.7598	2525.4532
0.3728	70.9289	77.5272	111.7021	71.9281	109.2918	154.2176	-8.8225	161.2099	382.7804	2527.3706
0.3729	70.9384	77.5348	111.5521	72.0123	109.219	153.8443	-7.3629	160.8963	382.1751	2524.9723
0.373	70.9469	77.5	111.5601	72	109.2245	154.0041	-10.2965	160.5822	382.4575	2528.6432
0.373	70.9272	77.5058	111.6629	71.9413	109.2772	153.7384	-10.1634	161.9015	382.3966	2525.7899
0.3731	70.9461	77.5323	111.5997	71.974	109.244	153.0194	-7.271	159.6804	381.8595	2524.2991

0.3732	70.9138	77.5267	111.6062	71.977	109.2318	152.9825	-9.518	160.5418	381.8323	2524.7333
0.3732	70.9218	77.5259	111.6858	71.9365	109.3176	154.9702	-11.5591	159.9022	380.7576	2528.1864
0.3733	70.8981	77.5331	111.6129	71.9691	109.2697	153.0998	-7.1009	160.7469	380.1003	2527.5316
0.3734	70.9333	77.517	111.5476	71.9975	109.2395	154.7649	-9.2922	161.4395	382.4631	2528.6833
0.3734	70.9238	77.5391	111.6762	71.9042	109.2971	154.5756	-11.8305	161.7013	382.309	2526.2589
0.3735	70.9226	77.5355	111.5925	71.9581	109.2421	154.0265	-7.7829	161.521	382.1978	2526.9182
0.3736	70.9249	77.5392	111.599	72.0013	109.2433	155.2415	-8.9243	161.3508	382.4464	2525.9341
0.3736	70.9416	77.5521	111.7163	71.9206	109.342	154.047	-12.3244	160.7009	382.3831	2525.017
0.3737	70.9068	77.5415	111.622	71.9609	109.2914	155.1551	-8.2694	160.2643	381.5937	2525.846
0.3738	70.9362	77.515	111.5764	72.0004	109.2572	153.6169	-8.2688	161.0014	381.7793	2526.6882
0.3739	70.931	77.5326	111.6757	71.9237	109.2874	153.6316	-12.8899	162.0345	380.3977	2527.6493
0.3739	70.9397	77.5488	111.7113	71.9191	109.3557	153.0965	-9.4692	161.1476	382.3191	2526.4631
0.374	70.9345	77.5401	111.539	72.0405	109.2462	153.6986	-7.6228	160.3403	382.2295	2526.1899
0.3741	70.9277	77.5318	111.6091	71.9835	109.2809	154.097	-12.7861	159.758	381.8429	2527.2486
0.3741	70.9406	77.5462	111.7038	71.9469	109.3247	153.385	-11.3265	161.4609	381.2285	2525.0629
0.3742	70.9198	77.529	111.4977	72.0233	109.2046	154.6497	-7.7475	160.6561	381.9038	2527.3368
0.3743	70.9548	77.5238	111.5954	71.9977	109.2546	154.3206	-11.0316	161.2488	380.2222	2528.2139
0.3743	70.945	77.5238	111.5815	71.9933	109.2791	154.8209	-12.8155	160.1176	382.2931	2526.8416
0.3744	70.9418	77.5331	111.5197	71.9997	109.2066	154.5559	-7.1056	161.118	382.4188	2526.3269
0.3745	70.9309	77.5243	111.5675	71.9962	109.2411	152.8981	-9.3264	161.0544	381.7793	2526.1363
0.3745	70.963	77.5237	111.5917	71.9786	109.2536	155.3186	-11.6076	160.39	381.4608	2523.8583
0.3746	70.9528	77.5389	111.651	71.9615	109.3102	153.0358	-8.2566	159.9868	381.4298	2525.3389
0.3747	70.9581	77.5595	111.5544	72.0069	109.2488	153.5331	-8.4467	160.8224	381.5992	2526.912
0.3748	70.9474	77.5132	111.5624	71.9691	109.2769	154.2233	-10.1987	161.3065	382.4409	2526.5433
0.3748	70.9592	77.5574	111.6491	71.9157	109.3276	153.265	-10.1914	161.2311	380.1056	2525.6303
0.3749	70.9339	77.5405	111.513	71.9929	109.2726	154.3617	-8.0935	160.4713	381.9426	2525.1086
0.375	70.9743	77.5262	111.5352	72.0097	109.2664	154.0265	-8.8747	160.7292	381.5781	2522.9163
0.375	70.9318	77.5461	111.5973	71.9612	109.2691	153.7106	-12.5698	160.1498	382.3025	2526.0944
0.3751	70.9504	77.5219	111.4976	72.0227	109.2263	153.5938	-7.1749	160.6832	382.3143	2524.741
0.3752	70.9272	77.5377	111.5049	72.0472	109.236	154.8307	-8.1818	160.9342	381.5675	2528.0759
0.3752	70.9384	77.5272	111.5794	71.9916	109.2864	153.6734	-12.6808	160.8113	381.5771	2527.481
0.3753	70.9326	77.5417	111.5213	71.9962	109.291	153.3297	-7.3987	160.8482	381.1341	2524.8201
0.3755	70.9362	77.5589	111.5354	71.9904	109.2618	152.6093	-11.0114	161.6129	382.023	2525.6609
0.3755	70.9211	77.5303	111.5787	71.9653	109.2882	154.4147	-9.202	161.1217	382.0976	2525.2689
0.3756	70.9231	77.5501	111.4435	72.0166	109.1931	152.5587	-6.8621	161.1106	382.0367	2526.4792
0.3757	70.9245	77.5472	111.48	71.9926	109.2279	153.4179	-9.2909	160.6337	381.8535	2524.1123
0.3757	70.9282	77.5603	111.5842	71.9633	109.2962	154.4686	-12.4772	159.8911	382.0201	2525.4933
0.3758	70.9169	77.5469	111.5668	72.0053	109.3028	153.3521	-7.9418	161.772	381.1808	2526.1056
0.3759	70.9438	77.5631	111.5078	72.0156	109.2247	154.7798	-8.247	160.9739	381.7598	2523.5296
0.3759	70.9169	77.5421	111.5968	71.9479	109.3448	154.4957	-13.2623	160.7751	381.3556	2525.0476
0.376	70.9008	77.5601	111.6474	71.9432	109.3786	154.4966	-10.9377	161.4114	380.6724	2524.0586
0.3761	70.917	77.5313	111.4864	72.045	109.2561	155.208	-7.4413	160.8852	381.2116	2527.3768
0.3761	70.9121	77.5544	111.5155	72.0056	109.2802	155.0389	-11.6359	161.6576	381.9869	2525.341
0.3762	70.9177	77.5598	111.6215	71.9755	109.2239	154.589	-13.4898	161.3195	381.3238	2524.9403
0.3763	70.9111	77.5387	111.4968	71.9999	109.2448	153.4952	-6.9315	160.7857	381.7105	2524.8636
0.3764	70.94	77.5517	111.5326	72.0128	109.2721	154.5633	-9.2812	161.4839	379.9325	2526.2948
0.3764	70.9553	77.5618	111.6097	71.9892	109.3393	154.2493	-12.031	161.1919	380.7908	2523.4335
0.3765	70.9203	77.5601	111.5322	72.0336	109.2778	154.0727	-7.555	160.8246	380.5294	2527.1176
0.3766	70.9392	77.535	111.5613	71.9972	109.3285	154.4601	-11.3246	161.0933	381.7158	2526.0059
0.3767	70.9632	77.529	111.6095	71.9763	109.3215	155.4031	-8.9361	160.1756	381.6159	2525.7498
0.3768	70.9555	77.5586	111.503	72.0038	109.2822	154.3864	-7.8402	160.4146	381.1967	2524.4113
0.3768	70.9582	77.5418	111.5345	72.0164	109.2609	155.49	-10.4688	161.9699	381.5622	2526.7649
0.3769	70.9681	77.5568	111.6143	71.9173	109.3414	155.299	-10.6451	160.6487	381.6657	2524.0907

0.377	70.9568	77.5303	111.5566	71.9862	109.2786	153.5526	-7.5286	161.2067	380.9514	2529.589
0.377	70.9392	77.5496	111.5375	72.0145	109.2615	155.6064	-9.2577	160.6196	381.8641	2527.6389
0.3771	70.9653	77.544	111.6301	71.9476	109.3565	154.2353	-11.8444	160.9024	380.9584	2524.5263
0.3772	70.9344	77.5461	111.5375	72.0383	109.2796	154.1806	-7.2739	160.2754	382.0367	2524.8441
0.3773	70.9637	77.5422	111.4887	72.0447	109.2483	154.8597	-14.1435	161.7463	381.4221	2527.3127
0.3773	70.9466	77.5608	111.6077	71.9974	109.3348	154.2401	-12.4416	161.1106	381.2283	2526.952
0.3774	70.9678	77.5438	111.5132	72.0212	109.2754	154.1983	-7.5222	160.8261	381.0677	2527.4009
0.3775	70.9389	77.5421	111.4639	72.0422	109.2527	155.0786	-7.8102	159.5061	381.1861	2527.0409
0.3775	70.9474	77.5463	111.5285	72.0189	109.2605	155.3223	-11.8339	161.2658	381.2836	2525.4693
0.3776	70.8984	77.5723	111.5457	71.974	109.3105	153.76	-8.7093	160.4216	381.3132	2525.4156
0.3777	70.9252	77.5496	111.5192	72.0171	109.2739	156.2735	-7.7819	160.6117	382.8894	2524.1388
0.3777	70.9328	77.5598	111.539	71.9964	109.3187	155.299	-10.0223	161.6798	381.9979	2524.9082
0.3778	70.9374	77.5644	111.6388	71.9728	109.3483	152.8884	-10.2522	161.3989	381.04	2527.986
0.3779	70.9208	77.5752	111.5862	71.9884	109.2958	155.9049	-8.0879	161.6377	381.0007	2527.6236
0.378	70.946	77.5613	111.5476	72.0516	109.31	155.5531	-11.8038	161.111	381.345	2526.0059
0.3781	70.9216	77.5562	111.6253	71.9923	109.2997	154.3682	-8.6272	160.475	381.7654	2526.4231
0.3782	70.9223	77.5791	111.5642	72.027	109.2858	154.2886	-8.9007	160.1141	381.6628	2525.6456
0.3782	70.9257	77.5578	111.614	71.9732	109.3461	154.2029	-12.0266	161.2695	381.8041	2525.8941
0.3783	70.9018	77.5708	111.6313	72.0099	109.3841	155.2456	-10.5944	161.4715	381.9541	2525.7376
0.3784	70.9188	77.5789	111.507	72.0531	109.2841	155.3399	-8.0742	162.3671	382.9503	2524.5716
0.3784	70.9265	77.5808	111.5634	72.0189	109.3186	153.5458	-11.6438	160.3686	380.7094	2526.0749
0.3785	70.9244	77.5921	111.6218	71.9786	109.3464	155.1681	-12.2025	161.5319	381.3224	2524.6117
0.3786	70.9165	77.5741	111.515	72.046	109.2872	153.3111	-7.3035	162.1306	381.0566	2524.3472
0.3786	70.94	77.5771	111.5652	72.0102	109.3198	153.7347	-10.5471	160.693	382.6236	2525.7017
0.3787	70.9274	77.5769	111.6117	71.9703	109.3933	154.27	-12.7769	160.7822	382.166	2525.8066
0.3788	70.9436	77.554	111.5064	72.0316	109.3095	153.9634	-7.2493	161.4644	380.683	2524.994
0.3789	70.9173	77.5799	111.5233	72.0059	109.2478	154.8745	-9.6202	161.7648	381.6657	2525.5013
0.3789	70.9257	77.5858	111.5559	72.0084	109.3306	153.299	-11.9287	161.2511	381.5992	2526.5273
0.379	70.9145	77.5908	111.5028	72.0378	109.2843	154.5899	-8.7943	160.563	382.399	2529.6092
0.3791	70.9405	77.5675	111.442	72.0635	109.2392	155.7394	-8.4517	161.4211	381.3058	2525.317
0.3791	70.9377	77.5701	111.4802	72.0465	109.2809	153.7759	-10.9801	160.4216	381.1596	2524.7563
0.3792	70.9308	77.5858	111.5525	72.0638	109.3323	154.9042	-10.7963	161.8608	381.4885	2524.5315
0.3793	70.9592	77.5818	111.4749	72.0558	109.2829	154.9648	-7.5782	160.7256	381.4668	2525.2009
0.3793	70.9358	77.5779	111.4677	72.0533	109.2876	154.5294	-9.6451	160.6161	381.1226	2526.0366
0.3794	70.952	77.5738	111.6012	71.9908	109.396	155.4635	-12.5662	160.5341	381.2947	2526.2868
0.3795	70.9336	77.5784	111.5072	72.0304	109.3045	154.5429	-7.2855	160.863	381.8373	2524.1628
0.3795	70.9788	77.5915	111.5149	71.9964	109.3037	154.2353	-8.2653	160.8388	382.1448	2525.1779
0.3796	70.9675	77.5827	111.5464	72.0089	109.3496	154.7178	-12.2852	160.7221	380.6512	2525.9906
0.3797	70.9824	77.6118	111.5641	72.0143	109.3413	155.6167	-8.287	160.4159	383.9637	2527.1284
0.3798	70.9665	77.5909	111.5122	72.0585	109.317	153.5656	-7.8186	161.6058	381.7488	2528.6111
0.3798	70.9531	77.5903	111.5562	72.0433	109.3594	155.5095	-11.0847	161.5281	381.2285	2527.1789
0.3799	70.9385	77.5832	111.594	71.9962	109.4189	155.6539	-10.1247	161.5171	381.7266	2523.9144
0.38	70.9558	77.5808	111.5464	72.0309	109.3472	154.6947	-8.0127	162.5885	381.9806	2526.5426
0.38	70.9546	77.5916	111.5385	72.0444	109.3057	155.9326	-10.005	160.8002	381.3944	2525.4132
0.3801	70.9375	77.5771	111.6169	71.9976	109.3745	154.4361	-11.9361	161.1746	381.3662	2526.0673
0.3802	70.9541	77.6181	111.5536	72.0113	109.3496	155.0164	-9.0823	160.1636	381.5887	2523.315
0.3802	70.9666	77.5781	111.4743	72.0531	109.2666	155.2935	-8.3662	161.6998	380.6801	2526.0063
0.3803	70.975	77.5993	111.5475	72.0127	109.3523	154.3264	-12.3434	160.475	381.6934	2527.1284
0.3804	70.9648	77.5971	111.5399	71.9998	109.3454	154.7214	-11.4197	161.0897	381.8747	2525.5919
0.3805	70.9423	77.5918	111.4457	72.0529	109.2992	155.0617	-7.6919	160.2838	381.3344	2524.143
0.3805	70.9727	77.5843	111.4809	72.0495	109.3057	155.13	-11.2274	161.5282	381.6103	2525.9261
0.3806	70.9602	77.5972	111.5107	72.0442	109.3305	154.2345	-12.9618	161.628	380.154	2526.5513
0.3807	70.9279	77.5969	111.5023	72.0543	109.3318	155.7254	-7.7849	161.3124	381.4774	2527.1559

0.3807	70.942	77.5919	111.4024	72.0615	109.2924	154.9395	-9.2828	161.7204	381.3113	2527.9299
0.3808	70.9565	77.5767	111.5241	72.0326	109.3536	155.0803	-11.9669	162.0901	381.1173	2524.419
0.3809	70.9535	77.583	111.352	72.1047	109.2596	155.6	-7.2699	160.9443	379.8273	2523.8663
0.381	70.9482	77.598	111.3442	72.0916	109.2819	155.0566	-10.1625	161.9052	382.081	2524.9082
0.3811	70.9303	77.5853	111.5451	72.0102	109.3725	154.5903	-11.9156	161.2511	381.4276	2526.4471
0.3811	70.9415	77.5888	111.3492	72.0738	109.2769	154.7417	-7.6758	160.9037	382.8839	2526.2467
0.3812	70.9318	77.6032	111.3845	72.0712	109.2884	154.9017	-8.5519	161.217	382.2878	2527.8919
0.3813	70.9394	77.6132	111.5095	72.0177	109.4063	154.3837	-13.314	161.27	381.5887	2527.2939
0.3814	70.9238	77.5903	111.3668	72.0727	109.2922	154.9266	-7.3474	162.1926	382.0336	2527.5162
0.3814	70.9267	77.5894	111.4169	72.0661	109.2969	155.3938	-8.2788	160.5526	381.2836	2525.7097
0.3815	70.938	77.6239	111.4586	72.0562	109.3601	154.9577	-13.2869	161.5952	381.2868	2524.833
0.3816	70.9157	77.6064	111.3926	72.0797	109.3353	154.4454	-7.6909	159.8578	381.1341	2527.7375
0.3816	70.9314	77.5832	111.3372	72.1159	109.3035	154.9737	-7.3226	161.0615	381.9276	2525.7759
0.3817	70.9351	77.6232	111.4252	72.0649	109.2957	153.3037	-11.6007	161.5837	381.6602	2525.1727
0.3818	70.9162	77.5779	111.4848	72.0414	109.3623	155.6419	-9.7853	160.913	380.4658	2524.5876
0.3818	70.9274	77.5891	111.3756	72.0817	109.2771	154.4317	-6.981	161.1993	381.0378	2525.1626
0.3819	70.9196	77.6051	111.3445	72.069	109.2671	155.1365	-9.8577	162.0937	381.2836	2525.7658
0.382	70.9575	77.602	111.5097	72.0326	109.3824	153.6498	-12.2592	162.1467	381.2815	2524.6796
0.382	70.9341	77.6095	111.4036	72.0602	109.3413	154.2382	-7.649	160.7337	381.71	2524.7239
0.3821	70.9436	77.5979	111.3291	72.132	109.2954	153.3992	-8.5646	161.019	380.9213	2526.9336
0.3822	70.9372	77.6023	111.4939	72.027	109.4216	154.8829	-13.7229	161.9791	381.483	2526.7196
0.3823	70.9489	77.6039	111.5109	72.0495	109.401	153.6845	-9.6467	162.393	381.0012	2526.0944
0.3823	70.957	77.6234	111.331	72.0973	109.3116	154.3437	-7.6333	160.8282	382.5526	2525.5306
0.3824	70.9471	77.6123	111.373	72.0725	109.3132	156.0961	-12.796	160.8704	380.4752	2526.6956
0.3825	70.9495	77.6171	111.365	72.095	109.3278	154.9507	-7.4546	161.325	382.7676	2527.2406
0.3826	70.9504	77.6266	111.325	72.0961	109.2985	155.8578	-10.3527	161.369	381.8164	2529.1415
0.3827	70.9245	77.6178	111.4154	72.0734	109.3601	154.4664	-12.9952	161.6871	381.2179	2524.6566
0.3827	70.9262	77.5838	111.338	72.07	109.3459	154.9916	-7.4327	162.1565	381.184	2524.796
0.3828	70.9691	77.6062	111.3685	72.0654	109.3389	154.7101	-8.7146	161.0108	380.9016	2526.3269
0.3829	70.9648	77.5947	111.3505	72.0854	109.3383	154.2078	-11.0348	161.5846	382.934	2526.6422
0.383	70.9812	77.6232	111.5025	72.0228	109.428	154.2087	-10.0137	160.9625	382.0336	2527.0716
0.383	70.9571	77.5967	111.2715	72.1555	109.2793	155.5201	-7.748	161.8904	381.782	2525.1727
0.3831	70.9765	77.6237	111.2725	72.1437	109.2954	154.1351	-8.7343	161.9791	381.3279	2524.9964
0.3832	70.9778	77.6149	111.4468	72.0589	109.3795	155.1576	-13.3662	161.5528	380.7465	2525.9139
0.3832	70.9793	77.6087	111.2632	72.1445	109.2861	156.1843	-7.3805	160.9	380.9237	2526.1425
0.3833	70.989	77.6285	111.3144	72.1391	109.2927	155.1772	-7.8056	162.0124	380.8048	2524.695
0.3834	70.9673	77.6222	111.3648	72.0641	109.3602	155.8425	-12.9245	161.4728	380.6801	2524.5395
0.3835	70.9941	77.6117	111.2672	72.1227	109.2838	156.0551	-7.1313	162.1785	380.7677	2527.1252
0.3836	70.9505	77.6079	111.3008	72.1241	109.3263	155.1579	-10.3632	161.1365	381.2892	2525.341
0.3836	70.9872	77.6166	111.3986	72.0781	109.3965	154.7788	-11.7162	161.6391	382.5738	2525.2288
0.3837	70.9812	77.6207	111.3247	72.1031	109.3174	154.9639	-7.2166	161.7861	381.8906	2525.3313
0.3838	70.9658	77.6054	111.2842	72.1522	109.3224	154.8422	-8.5569	161.7402	381.3132	2526.3203
0.3839	70.9745	77.6344	111.3765	72.1271	109.3619	154.9609	-13.67	161.3693	381.8595	2526.2788
0.3839	70.9566	77.6115	111.4332	72.0622	109.391	155.1049	-10.1414	161.7648	380.9348	2524.9723
0.384	70.9791	77.6136	111.2712	72.1654	109.2465	155.4031	-7.8352	161.5061	381.4664	2527.2406
0.3841	70.9691	77.6367	111.364	72.1042	109.3695	154.4361	-11.9845	161.6169	381.0012	2525.333
0.3841	70.9922	77.6244	111.4372	72.0858	109.3891	155.4669	-12.9655	160.5454	380.7836	2525.0783
0.3842	70.977	77.6268	111.301	72.1243	109.3164	155.9233	-7.0668	161.2178	381.3778	2525.4372
0.3843	70.9822	77.6315	111.2995	72.141	109.3378	153.2712	-9.7453	161.0332	380.7518	2525.6886
0.3843	70.9824	77.6245	111.3675	72.0873	109.3503	156.0171	-12.2938	162.138	381.2061	2526.4311
0.3844	70.9726	77.6341	111.2564	72.1434	109.2946	156.5482	-7.6012	160.5807	381.5781	2523.5296
0.3845	70.9714	77.6207	111.2924	72.1117	109.3354	154.8111	-10.4466	162.9314	382.3302	2525.0323
0.3846	70.9778	77.6198	111.4353	72.079	109.44	153.8701	-10.2763	162.0124	381.2444	2524.948

0.3847	70.9622	77.6212	111.284	72.1374	109.3294	155.2047	-7.9691	162.0937	381.5516	2525.7453
0.3848	70.9487	77.6163	111.2993	72.1378	109.3298	155.3213	-9.0467	162.2526	381.3888	2524.9643
0.3848	70.9535	77.6237	111.4537	72.0755	109.4191	154.6925	-11.975	161.2954	382.0312	2525.4853
0.3849	70.9403	77.641	111.3815	72.0786	109.407	154.411	-7.7438	161.8202	381.0732	2523.73
0.385	70.9262	77.6195	111.3264	72.1439	109.3694	155.801	-8.6402	161.878	381.2762	2525.9293
0.385	70.9604	77.6147	111.3662	72.1014	109.3829	155.4127	-11.3722	161.1852	380.3281	2526.6882
0.3851	70.9299	77.6232	111.3286	72.1095	109.3716	153.2766	-8.5693	162.2457	381.1014	2527.1022
0.3852	70.9349	77.6281	111.2855	72.1544	109.3009	155.7431	-8.2607	162.0456	380.9292	2524.8521
0.3852	70.95	77.6202	111.3372	72.087	109.3451	154.1416	-10.221	161.1772	381.0732	2525.349
0.3853	70.9377	77.6461	111.3989	72.0962	109.4093	153.6762	-9.1711	162.855	381.6657	2528.3306
0.3854	70.9377	77.6383	111.3531	72.11	109.3937	155.5255	-8.8191	161.8003	380.826	2525.8833
0.3855	70.9612	77.6519	111.4262	72.1014	109.4141	153.8133	-9.5783	161.7402	381.2973	2525.7146
0.3855	70.9145	77.6419	111.433	72.057	109.452	155.1612	-9.9722	161.5139	381.9382	2523.545
0.3856	70.9196	77.6382	111.3981	72.1031	109.3985	154.1537	-9.0443	160.0426	380.6081	2525.0285
0.3857	70.9403	77.6461	111.3577	72.1207	109.3757	154.3478	-9.4131	161.9606	382.7898	2527.8096
0.3857	70.9487	77.6367	111.3555	72.0904	109.3734	155.6158	-10.2173	160.8335	380.7963	2527.3528
0.3858	70.9587	77.6203	111.4072	72.1017	109.4167	153.6356	-9.3308	161.5846	381.6416	2523.8363
0.3859	70.9124	77.6438	111.3913	72.0809	109.4043	154.5661	-9.9133	161.7019	381.5771	2524.9002
0.386	70.9546	77.6273	111.3517	72.1325	109.3998	154.2345	-9.9413	162.478	380.669	2524.1789
0.3861	70.9525	77.6252	111.3585	72.1062	109.394	156.032	-9.0522	161.24	380.7853	2524.804
0.3861	70.9362	77.6268	111.3462	72.1422	109.3767	156.1435	-10.0719	162.733	380.8185	2526.4792
0.3862	70.9541	77.6278	111.2969	72.1066	109.364	154.7534	-10.4178	160.8635	381.4721	2525.5613
0.3863	70.9763	77.6378	111.2751	72.1308	109.3853	156.0213	-9.1148	162.3482	381.112	2525.1549
0.3864	70.9548	77.6326	111.3771	72.0869	109.4202	155.9818	-10.7055	161.6465	381.0234	2524.9323
0.3865	70.9936	77.651	111.3921	72.097	109.4301	156.4166	-9.2567	163.6458	381.4885	2525.8299
0.3866	70.9507	77.626	111.3153	72.1388	109.3709	154.8494	-9.0945	162.733	380.2648	2526.0303
0.3866	70.9582	77.6417	111.3312	72.0877	109.379	156.088	-10.1756	161.4397	381.7423	2526.2436
0.3867	70.9548	77.6352	111.381	72.1113	109.409	155.5434	-9.9396	161.6428	381.4719	2529.2123
0.3868	70.9656	77.6344	111.3619	72.1214	109.3834	155.1497	-9.0237	161.8285	382.1289	2528.0376
0.3868	70.9624	77.6726	111.3712	72.0992	109.4047	154.4966	-9.8585	161.673	380.9478	2523.9283
0.3869	70.9543	77.6573	111.3833	72.1163	109.4263	154.2647	-9.8472	161.5351	381.3132	2525.2393
0.387	70.9707	77.6566	111.3717	72.1168	109.4052	155.4909	-9.4241	161.9876	381.0007	2527.4856
0.3871	70.959	77.6741	111.3763	72.1092	109.4361	156.6033	-10.2367	162.6168	381.1385	2525.1703
0.3872	70.9515	77.6497	111.3337	72.1115	109.4143	155.4746	-9.8448	160.8039	381.3168	2524.0907
0.3873	70.9689	77.6772	111.3336	72.1396	109.3967	156.058	-9.4424	161.4987	381.1507	2528.01
0.3873	70.9666	77.6393	111.321	72.1293	109.3917	156.1221	-9.9451	160.8593	380.7133	2525.3651
0.3874	70.9717	77.6469	111.3823	72.1049	109.4404	154.2689	-9.7972	162.2747	382.2194	2523.193
0.3875	70.9465	77.6665	111.3185	72.1163	109.4311	156.1306	-9.5711	161.6907	380.5452	2524.2273
0.3875	70.9293	77.6479	111.2892	72.125	109.3498	155.6873	-9.623	161.4765	380.9901	2525.8941
0.3876	70.9482	77.6658	111.3547	72.1019	109.4217	154.0105	-10.3549	161.5069	380.5664	2525.9599
0.3877	70.9341	77.6655	111.3823	72.11	109.4379	156.5624	-10.0297	162.3339	381.5439	2526.8799
0.3877	70.9112	77.6553	111.3492	72.0992	109.4374	155.4161	-8.7769	162.2637	380.9459	2525.4693
0.3878	70.9415	77.6601	111.372	72.1327	109.4602	153.8127	-11.103	162.3819	381.9204	2527.3207
0.3879	70.9358	77.6461	111.3791	72.0608	109.4486	156.9961	-10.8442	161.4291	381.2603	2526.5732
0.388	70.9441	77.6933	111.3332	72.1215	109.4194	154.8547	-8.4973	163.6632	381.3556	2524.925
0.388	70.9308	77.6902	111.455	72.0717	109.4881	155.1077	-11.0762	161.5874	381.5992	2526.6074
0.3882	70.9234	77.665	111.3397	72.0896	109.463	154.6414	-8.3111	161.118	382.0976	2527.2887
0.3882	70.9083	77.6703	111.4214	72.0936	109.482	155.6186	-10.888	161.495	380.0599	2527.8978
0.3883	70.9262	77.678	111.4603	72.0629	109.5178	154.7454	-11.3408	162.3164	380.8683	2525.6686
0.3884	70.9303	77.6489	111.374	72.122	109.4798	154.5327	-8.7113	162.9917	380.0544	2525.5494
0.3884	70.9363	77.6344	111.347	72.1136	109.4429	156.0471	-10.4884	162.5143	382.0283	2525.2009
0.3885	70.9188	77.668	111.4319	72.084	109.4901	155.0538	-11.7502	161.4802	380.9514	2525.7578
0.3886	70.9673	77.6782	111.3745	72.1021	109.4577	155.5201	-8.5448	161.0885	381.3224	2524.4434

0.3887	70.9424	77.6697	111.4023	72.1162	109.467	155.9049	-11.7187	162.4825	380.8736	2525.2239
0.3888	70.9358	77.6534	111.4329	72.096	109.4928	154.9186	-8.8861	162.8749	380.4022	2527.7156
0.3889	70.9568	77.6938	111.3643	72.1459	109.4866	155.8596	-8.8121	161.1958	379.7614	2525.8603
0.3889	70.9696	77.706	111.4419	72.089	109.4976	153.9465	-10.567	162.9732	378.9857	2525.5494
0.389	70.9691	77.6622	111.4923	72.0357	109.553	155.195	-10.4029	161.9532	381.0843	2524.1308
0.3891	70.9622	77.6604	111.4149	72.0972	109.5181	156.5912	-8.5989	162.9587	382.009	2527.3688
0.3891	70.9868	77.658	111.4749	72.0655	109.542	154.3384	-10.0033	162.1184	381.2497	2525.6916
0.3892	70.9811	77.669	111.5194	72.0633	109.5927	155.2684	-11.5891	162.2969	381.4165	2523.698
0.3893	70.9634	77.6882	111.4109	72.1102	109.4923	157.1773	-8.1688	161.8144	380.7253	2526.2743
0.3893	70.9714	77.6696	111.3923	72.0998	109.4881	155.0835	-9.1143	162.43	380.2592	2526.1666
0.3894	70.9696	77.6652	111.4404	72.0875	109.5036	156.2382	-12.0887	161.5837	381.3058	2527.4329
0.3895	70.9423	77.6736	111.4337	72.1138	109.5169	156.1147	-8.4302	162.6295	382.0035	2526.8639
0.3895	70.9658	77.6785	111.3437	72.1371	109.4635	155.4766	-8.4574	161.2806	380.5611	2525.8679
0.3896	70.9285	77.6583	111.4085	72.0931	109.4803	156.3972	-10.9875	162.2845	381.5463	2525.7913
0.3897	70.9854	77.6614	111.4216	72.0894	109.5007	155.3336	-9.852	162.1538	380.5399	2525.6609
0.3898	70.9589	77.6571	111.3614	72.1347	109.427	155.9196	-8.0167	161.7093	381.566	2527.6493
0.3899	70.9729	77.6636	111.41	72.1118	109.4555	155.0866	-11.3605	161.9699	381.2497	2527.9149
0.3899	70.958	77.6658	111.3972	72.1061	109.5098	154.5259	-9.0573	162.4719	380.2698	2524.8406
0.39	70.9627	77.6736	111.3669	72.1097	109.4426	155.3919	-8.5847	162.9732	380.6358	2526.407
0.3901	70.9482	77.6901	111.3926	72.1356	109.4861	155.9298	-12.2156	161.5245	380.487	2525.8296
0.3902	70.9556	77.692	111.3705	72.1031	109.4788	154.6311	-10.9457	162.3782	380.8628	2523.2972
0.3902	70.9446	77.6759	111.2624	72.1743	109.4008	155.8165	-8.4524	161.5467	381.8484	2526.7196
0.3903	70.9313	77.6932	111.3171	72.1304	109.4178	156.7445	-10.701	160.9702	381.1452	2523.5858
0.3904	70.926	77.6875	111.3636	72.1402	109.4738	155.2669	-11.9335	162.0088	381.3079	2527.1636
0.3905	70.9309	77.6729	111.3542	72.1258	109.4549	156.7588	-8.6957	162.3093	381.1226	2525.4846
0.3905	70.9497	77.7038	111.2657	72.1724	109.4047	155.928	-9.3336	161.9028	380.9743	2525.3466
0.3906	70.9321	77.6685	111.3141	72.1401	109.4249	156.1295	-10.8397	162.9104	381.9315	2529.4287
0.3907	70.9638	77.6925	111.3946	72.1225	109.4728	155.9809	-10.6184	161.8128	379.772	2525.7738
0.3907	70.9574	77.6912	111.2824	72.1666	109.4208	155.1922	-8.1775	162.3413	382.3855	2527.5371
0.3908	70.9692	77.6892	111.3055	72.1813	109.4061	156.6113	-9.4944	161.8391	380.5717	2525.4233
0.3909	70.9448	77.6697	111.3787	72.097	109.4746	155.5717	-12.3875	162.1043	380.9372	2527.6312
0.3909	70.9533	77.6897	111.289	72.1401	109.4223	154.4101	-8.2166	161.9163	380.9791	2522.3755
0.391	70.9607	77.6758	111.2813	72.1737	109.4491	156.4994	-8.8465	162.3977	381.255	2522.648
0.3911	70.9584	77.6871	111.312	72.1559	109.4504	155.5945	-11.069	161.0737	381.7155	2527.2085
0.3911	70.9712	77.6668	111.3419	72.1506	109.4602	154.5503	-9.3262	161.7056	380.8628	2523.5537
0.3912	70.9328	77.6943	111.2678	72.1771	109.4404	156.3376	-8.7397	162.486	381.1385	2525.4616
0.3913	70.9377	77.6821	111.3384	72.1414	109.4462	155.1523	-9.8987	162.1219	381.5251	2525.0476
0.3914	70.9399	77.6721	111.3185	72.1431	109.4743	154.3037	-10.425	161.0226	379.1787	2526.4889
0.3914	70.9855	77.6785	111.2576	72.1618	109.4336	156.0766	-9.1461	162.5556	381.7266	2525.7899
0.3915	70.9919	77.6823	111.2714	72.1809	109.4223	154.4435	-9.2488	162.5002	380.5804	2527.6654
0.3916	70.9707	77.679	111.3536	72.1548	109.4644	155.0427	-10.7952	162.6184	380.3589	2523.5617
0.3916	70.9705	77.6953	111.3739	72.1263	109.4794	154.9373	-9.811	162.0583	380.9849	2525.3849
0.3917	70.9614	77.6863	111.3218	72.1685	109.432	153.8995	-8.6912	162.7229	381.0325	2525.6379
0.3918	70.9684	77.7098	111.3762	72.1319	109.4519	155.5359	-10.4382	162.0013	381.1397	2527.2807
0.3919	70.9722	77.6799	111.3523	72.1337	109.4482	155.4695	-8.6936	161.7084	382.113	2529.3255
0.392	70.9497	77.6892	111.3568	72.1407	109.4911	153.9839	-9.8834	161.6765	381.0378	2526.1976
0.3921	70.9497	77.7243	111.4194	72.1324	109.5252	155.5963	-10.3408	162.4337	380.9735	2527.1204
0.3922	70.9485	77.7026	111.3578	72.1515	109.4777	156.1973	-9.2336	163.3379	381.1067	2523.913
0.3923	70.9382	77.6874	111.3346	72.1661	109.483	155.0213	-9.2505	161.6021	379.2127	2522.624
0.3923	70.9334	77.6724	111.3662	72.137	109.5121	155.535	-10.8676	163.4832	382.2305	2525.0846
0.3924	70.9589	77.7207	111.5584	72.1444	109.4792	155.7598	-9.0157	163.1876	381.8872	2524.5716
0.3925	70.9331	77.7077	111.3619	72.1633	109.4426	155.2628	-8.8642	162.0715	380.0544	2525.9902
0.3925	70.9104	77.6719	111.3811	72.1605	109.5201	155.753	-9.9518	161.8427	381.2762	2525.6916

0.3926	70.9247	77.6994	111.4342	72.1271	109.555	155.1235	-10.5453	162.2304	381.5771	2525.4613
0.3927	70.9436	77.6977	111.3789	72.1412	109.5012	155.1061	-9.1009	160.4959	380.344	2524.764
0.3927	70.9438	77.6879	111.3748	72.1381	109.4856	155.81	-9.0732	163.2615	381.5217	2527.8738
0.3928	70.9272	77.7044	111.461	72.1161	109.5593	155.4152	-10.8932	163.0804	380.6635	2526.7837
0.3929	70.9519	77.7109	111.4588	72.1297	109.5307	155.5557	-10.4652	162.4931	382.0124	2525.3313
0.393	70.9589	77.7004	111.3429	72.1541	109.4963	155.5564	-8.373	162.3967	382.3246	2526.944
0.393	70.935	77.7038	111.3599	72.1536	109.4942	155.8614	-10.0552	162.5461	380.683	2525.0629
0.3931	70.9436	77.7105	111.3725	72.1357	109.5159	155.2424	-10.8323	161.9939	380.8683	2526.7356
0.3932	70.9482	77.7126	111.4098	72.1431	109.5482	155.2136	-8.9017	162.8808	381.7266	2524.1388
0.3932	70.9477	77.7146	111.3005	72.1799	109.4414	156.175	-8.9866	162.5926	380.8905	2525.6055
0.3933	70.9565	77.7179	111.3034	72.1742	109.464	155.3069	-9.5052	162.2704	379.5813	2524.534
0.3934	70.9624	77.7092	111.3691	72.1385	109.5129	155.8489	-10.7412	162.4012	380.8789	2527.2402
0.3934	70.9778	77.7148	111.2762	72.1978	109.4488	155.8498	-8.6268	162.6663	381.0643	2527.4396
0.3936	70.9737	77.7202	111.3363	72.1628	109.4797	156.3711	-10.9479	161.8645	382.596	2525.6376
0.3936	71.0074	77.7335	111.3366	72.1528	109.48	155.7468	-9.2095	162.5482	380.6136	2523.6739
0.3937	70.9827	77.6977	111.3441	72.1668	109.4807	156.6549	-8.5758	162.7618	380.5241	2527.2709
0.3938	70.9595	77.733	111.3804	72.1695	109.4906	156.6113	-9.9298	162.433	380.969	2527.9149
0.3939	70.9783	77.7104	111.407	72.138	109.534	154.5721	-10.5298	162.3765	381.4033	2525.6839
0.3939	70.9847	77.7133	111.3652	72.1411	109.5035	157.2285	-9.437	160.002	379.2459	2525.6296
0.394	70.9862	77.7352	111.3183	72.1929	109.4567	156.1165	-8.8923	161.9126	378.9248	2526.5353
0.3941	70.9681	77.7095	111.3587	72.1702	109.4945	154.11	-10.6399	161.5652	380.9071	2527.4249
0.3942	70.9951	77.7272	111.335	72.1649	109.5028	154.8004	-8.451	162.1502	380.2328	2525.1779
0.3943	70.961	77.7228	111.2666	72.1939	109.4727	154.8615	-10.1348	162.4891	380.0156	2526.1586
0.3943	70.9475	77.726	111.3661	72.1599	109.5196	155.5131	-10.4628	161.6306	380.5399	2525.5306
0.3944	70.9725	77.7342	111.3719	72.1887	109.5429	155.7004	-9.2426	162.345	381.6989	2525.7338
0.3945	70.9661	77.7274	111.3031	72.1861	109.4829	155.9316	-9.8477	161.4468	380.7041	2525.0936
0.3946	70.9505	77.7276	111.3118	72.194	109.4828	155.4821	-10.3198	162.0419	382.2914	2525.3971
0.3947	70.9453	77.7067	111.2748	72.1866	109.4906	155.3087	-8.8625	162.4507	380.8154	2527.1406
0.3948	70.9377	77.7149	111.3014	72.1834	109.5025	156.3878	-9.5548	162.9658	382.5074	2526.1345
0.3948	70.9477	77.7121	111.3316	72.163	109.495	155.8759	-10.3285	163.5312	383.5317	2523.7781
0.3949	70.9472	77.7269	111.2998	72.1485	109.4958	154.8374	-9.3126	162.4226	381.0843	2525.9101
0.395	70.9578	77.7289	111.343	72.1901	109.494	155.043	-9.7846	161.673	380.8577	2526.2886
0.3951	70.9666	77.7462	111.3283	72.1648	109.5193	155.3799	-9.8262	163.3797	380.1872	2527.2486
0.3952	70.95	77.7308	111.3554	72.1539	109.4872	154.6912	-9.3433	161.3831	379.6554	2528.9115
0.3952	70.9459	77.7307	111.361	72.17	109.5069	154.4509	-9.2726	162.0161	380.6081	2526.8078
0.3953	70.9619	77.7306	111.3273	72.1839	109.4904	155.7317	-10.2759	162.7052	380.2645	2525.9139
0.3954	70.9651	77.7143	111.3103	72.1666	109.5621	154.6876	-9.8783	162.4472	379.9573	2525.9139
0.3955	70.9781	77.7449	111.3396	72.1661	109.5056	155.077	-9.24	162.3487	380.6468	2525.846
0.3955	70.9734	77.7274	111.2904	72.1903	109.511	156.4558	-9.8977	162.5143	379.9203	2524.9096
0.3956	70.9515	77.7515	111.3665	72.1628	109.56	154.9126	-10.141	162.7995	381.5107	2524.7079
0.3957	70.97	77.7362	111.3153	72.179	109.5095	154.8022	-9.5757	161.7614	380.8895	2524.672
0.3958	70.9541	77.7337	111.2636	72.2113	109.4973	156.3181	-10.0574	161.2695	380.6302	2524.9884
0.3959	70.9393	77.7495	111.3258	72.1955	109.5244	155.8834	-10.0433	161.835	381.123	2526.2067
0.396	70.9709	77.7658	111.2423	72.2024	109.5086	156.3441	-9.7709	161.6502	381.0012	2525.0285
0.3961	70.9806	77.7449	111.2947	72.197	109.4908	155.43	-9.9389	162.4595	380.9348	2526.0624
0.3961	70.9837	77.7352	111.299	72.1844	109.5292	156.5696	-9.5365	162.5532	380.4976	2526.7342
0.3963	70.9724	77.7532	111.2779	72.1849	109.5273	155.2136	-10.2392	162.0795	380.0262	2524.9326
0.3964	70.9868	77.7383	111.2544	72.1712	109.5206	155.2619	-9.5339	162.441	380.9791	2527.6093
0.3965	70.9566	77.7423	111.311	72.1282	109.5484	155.5842	-10.0525	162.3482	379.8567	2554.1803
0.3966	70.9755	77.7373	111.2641	72.1812	109.5505	155.5461	-9.9273	161.5171	380.1153	2561.5848
0.3967	70.9658	77.7442	111.3395	72.1646	109.601	156.635	-10.1068	162.2669	380.8207	2611.3188
0.3969	70.9929	77.7571	111.4324	72.0716	109.7389	155.3213	-10.0535	163.036	380.9846	2749.9368
0.397	70.9851	77.7757	111.5569	72.0196	109.8016	154.5286	-10.3828	164.1404	381.2179	2779.0312

0.397	70.971	77.7566	111.5926	71.968	109.8205	153.1984	-10.2408	162.1078	380.4181	2829.3234
0.3971	70.9832	77.7778	111.6443	71.9658	109.833	152.2948	-9.8202	162.5667	380.4973	2908.3449
0.3972	70.9759	77.7786	111.5693	71.9981	109.802	152.9336	-10.4129	161.8073	380.1639	2922.1878
0.3973	70.9903	77.7826	111.728	71.885	109.869	151.8592	-10.0591	162.5926	382.3911	2975.8311
0.3973	71.0011	77.7704	111.7251	71.8642	109.8561	151.2795	-9.67	163.9045	381.3778	3034.2122
0.3975	70.9995	77.7774	111.73	71.8615	109.8434	151.692	-9.7044	161.8571	379.3788	3087.4318
0.3975	71.0064	77.7749	111.7964	71.8434	109.9069	151.36	-9.3002	162.783	380.0156	3173.6723
0.3976	70.9689	77.6518	117.8946	68.6566	111.2901	148.8485	-9.4589	162.09	380.2426	3218.9657
0.3977	70.9649	77.641	118.1627	68.5683	111.1436	153.3281	-9.7667	163.0375	380.1745	3257.0457
0.3977	70.9942	77.7508	112.0674	71.6843	110.008	151.8629	-9.3282	163.2726	380.525	3317.7345
0.3978	70.9937	77.789	112.1135	71.607	110.0945	149.0844	-9.4493	162.7794	380.9584	3413.2586
0.398	71	77.7905	112.0902	71.6126	110.0496	148.6952	-9.2702	163.7833	380.5082	3483.4839
0.3981	70.961	77.789	112.172	71.5916	110.0775	148.4778	-9.1763	163.2762	380.7244	3524.7458
0.3982	70.98	77.8022	112.2573	71.5679	110.0873	148.5388	-8.949	162.4436	379.6395	3524.8754
0.3983	70.9949	77.8097	112.3793	71.6507	110.1062	148.3664	-9.0436	162.433	381.541	3520.8045
0.3984	71.0054	77.7958	112.4249	71.553	110.1902	146.6133	-9.2637	162.9668	381.7264	3565.3163
0.3984	70.9901	77.8002	112.4161	71.6104	110.1186	148.3859	-8.9098	162.4632	380.6579	3574.3025
0.3985	70.9683	77.7929	112.4311	71.5765	110.1077	147.1331	-9.2354	162.8749	381.8323	3576.0647
0.3986	70.9755	77.7984	112.4898	71.6064	110.1196	147.6771	-9.3181	163.668	380.5472	3576.6348
0.3986	70.9845	77.8149	112.5722	71.5601	110.1444	147.0918	-8.948	163.206	380.896	3625.2298
0.3987	70.9656	77.8049	112.6028	71.5388	110.1379	147.405	-9.4542	160.9095	380.0633	3624.2948
0.3988	70.9759	77.8029	112.6184	71.5475	110.132	145.595	-8.9942	162.0124	379.7561	3627.8751
0.3989	70.9846	77.7825	112.7212	71.5642	110.1724	146.7697	-9.1102	162.3658	380.4446	3627.3001
0.399	70.9707	77.7936	112.6742	71.6207	110.1988	146.6292	-8.675	163.2873	380.896	3622.8092
0.3991	70.9763	77.8093	112.7397	71.6184	110.2342	145.7811	-8.8098	162.866	381.2338	3574.7353
0.3991	70.9781	77.7905	112.7232	71.6151	110.1912	147.7578	-8.377	163.49	380.2645	3573.6498
0.3992	70.9888	77.8085	112.7586	71.6268	110.2435	146.9554	-9.1169	162.889	382.2507	3575.6967
0.3993	70.9952	77.8205	112.7487	71.6403	110.2633	148.4527	-8.5932	164.2851	379.8716	3577.8291
0.3993	70.9822	77.8044	112.7527	71.6257	110.2519	148.1185	-9.2034	162.4436	380.0421	3575.6584
0.3994	70.9804	77.8109	112.7537	71.7042	110.2884	147.3148	-8.7604	162.271	382.895	3571.3049
0.3995	70.9855	77.7931	112.8261	71.6477	110.3057	147.7923	-9.073	164.0117	381.0566	3574.1422
0.3995	70.9544	77.8302	112.7998	71.6785	110.2775	147.1376	-8.2802	163.292	380.5664	3578.15
0.3996	70.9932	77.8109	112.8519	71.6664	110.3365	148.0003	-9.1595	162.8586	379.5339	3576.6108
0.3997	70.9756	77.8222	112.9142	71.6364	110.3368	147.9337	-8.7043	162.3552	378.1406	3572.2851
0.3998	71.0092	77.8193	112.9389	71.6809	110.3483	147.9381	-8.8583	163.6236	381.5716	3575.6009
0.3998	70.9952	77.8231	112.9103	71.6441	110.3548	146.0551	-8.8552	163.668	380.3368	3575.8574
0.3999	70.9865	77.817	113.003	71.6646	110.41	147.5777	-8.8896	163.4315	381.9149	3575.7211
0.4	70.9832	77.8009	113.0651	71.7074	110.4119	146.5846	-8.9199	162.7736	380.5139	3574.3586
0.4	70.9832	77.8151	113.0357	71.6966	110.3936	149.032	-9.1348	163.2708	380.7253	3573.7494
0.4001	70.9983	77.8109	113.0755	71.6924	110.4123	146.9283	-8.5901	163.1432	381.8872	3575.7853
0.4002	71.011	77.7966	113.1143	71.6815	110.4411	147.0176	-8.829	161.8816	380.7942	3576.7164
0.4002	70.9965	77.8015	113.1792	71.6628	110.4785	146.7045	-8.8964	162.9178	379.999	3592.5526
0.4003	71.0003	77.8321	113.2039	71.6873	110.4804	148.1025	-9.0587	162.2351	380.3599	3591.4438
0.4005	70.9866	77.8136	113.2473	71.6729	110.4951	148.0643	-8.8226	162.6239	380.5876	3591.9498
0.4006	70.9794	77.8404	113.3413	71.7003	110.5655	146.1192	-8.7848	163.158	380.4918	3593.6347
0.4007	70.961	77.8348	113.3265	71.721	110.5482	147.1132	-8.7753	162.4817	379.5594	3592.4003
0.4008	70.9751	77.8363	113.3118	71.7435	110.5572	148.242	-9.054	162.9562	380.058	3595.0854
0.4009	70.9697	77.818	113.3664	71.6979	110.5931	147.4969	-8.8618	162.478	381.2006	3591.8233
0.401	70.9847	77.8409	113.4311	71.7235	110.5735	146.6933	-9.1605	163.9318	380.4287	3592.3714
0.4011	70.976	77.8396	113.4532	71.7455	110.6299	147.8768	-8.9614	163.3945	381.0732	3593.2339
0.4011	70.9776	77.8259	113.4613	71.7307	110.6605	145.7179	-8.8137	162.6332	380.1485	3593.3541
0.4012	70.9834	77.8275	113.4965	71.7437	110.6365	147.7213	-9.0972	161.5634	380.1003	3591.3441
0.4013	71.0042	77.8263	113.5426	71.671	110.7138	147.2193	-8.7546	163.8753	380.8366	3592.3638

04014	70.9804	77.844	113.5833	71.7197	110.6873	147.4337	-9.1827	163.6199	381.0455	3593.3541
04015	70.9669	77.833	113.7025	71.6931	110.7164	147.7876	-8.8247	163.0952	382.7842	3590.1081
04016	70.9909	77.829	113.8047	71.6977	110.7911	146.1415	-8.9192	161.6206	379.4785	3592.8091
04016	70.9898	77.7999	113.7677	71.7008	110.749	146.5224	-8.822	164.178	381.5882	3593.5465
04017	70.993	77.8492	113.7781	71.74	110.7313	147.8297	-8.8984	163.8505	381.1967	3592.5248
04018	70.9834	77.8665	113.8196	71.7213	110.7512	148.4873	-9.2944	164.1404	380.2328	3592.2794
04019	70.9743	77.848	113.9531	71.7187	110.8242	146.8447	-8.9214	162.563	380.6635	3593.811
0402	71.0069	77.8582	114.0301	71.7381	110.8637	146.584	-9.215	163.0375	380.5823	3593.5981
04021	70.9827	77.8437	114.0442	71.7273	110.8628	147.8963	-8.9912	163.9156	381.71	3593.3461
04022	70.9978	77.8358	114.056	71.7394	110.8445	147.1188	-8.9738	162.685	381.2504	3594.4281
04024	70.9684	77.8346	114.1046	71.7685	110.8756	148.266	-8.9807	162.4743	381.8706	3592.5206
04025	71.0001	77.8684	114.1571	71.7821	110.9188	146.5085	-8.8989	162.2987	380.7094	3593.9737
04027	70.9798	77.8531	114.2824	71.734	110.9435	146.8985	-9.1686	163.3309	381.7581	3595.5454
04027	70.9704	77.8442	114.1973	71.7685	110.8982	148.7611	-8.9861	163.8897	380.143	3592.5126
04028	71.0106	77.8375	114.2647	71.7745	110.9497	146.5307	-8.5737	161.5069	380.4711	3594.771
04029	70.9724	77.8239	114.3122	71.7643	110.9469	146.9909	-9.0063	161.726	381.6416	3593.0077
0403	70.9796	77.8279	114.3651	71.794	110.9985	147.4783	-8.9901	162.2784	380.9569	3593.6507
0403	71.0005	77.8324	114.3584	71.787	110.9093	148.4668	-8.7335	163.0092	380.2275	3593.6441
04032	70.9784	77.8216	114.445	71.8091	110.9079	146.6014	-8.8769	162.8734	380.0045	3591.9034
04033	70.9829	77.8491	114.4777	71.776	111.031	146.9609	-8.8828	163.2282	380.6081	3590.6771
04034	70.9883	77.8567	114.4719	71.8222	111.0205	149.2772	-9.4591	162.6522	379.8249	3592.8314
04034	70.9697	77.8333	114.596	71.7792	111.0541	147.2182	-9.175	163.5645	382.4797	3592.6809
04035	70.9742	77.8426	114.5955	71.8139	111.0484	147.7613	-9.0316	162.889	380.1268	3592.1184
04036	70.9781	77.8595	114.6566	71.7823	111.0998	147.0649	-9.1663	162.3191	379.4729	3590.6451
04037	70.9978	77.8395	114.6283	71.8009	111.0188	149.279	-8.8835	162.9597	381.149	3594.2574
04038	70.9778	77.8542	114.7735	71.802	111.0614	146.9302	-8.91	163.6717	380.1374	3594.1556
04039	70.9733	77.8572	114.8752	71.7933	111.1356	147.8378	-8.9945	163.0176	380.7963	3592.7049
0404	70.9791	77.8452	114.8751	71.7958	111.0854	147.5684	-9.0256	162.5482	379.4896	3593.1538
04041	70.9822	77.833	114.7914	71.8483	111.0642	147.7672	-9.068	162.9067	380.3755	3593.4263
04041	70.9873	77.8738	114.8271	71.8719	111.0799	146.7045	-8.7896	162.3413	380.0101	3592.5526
04042	71.012	77.8633	114.92	71.8077	111.1239	147.8964	-9.3517	164.0379	380.344	3595.2464
04043	70.9768	77.8404	114.9947	71.7926	111.1474	147.0175	-8.8637	163.7086	381.1175	3592.0236
04043	71.0025	77.8709	114.9763	71.848	111.1227	148.6108	-8.988	162.6734	380.2592	3594.4261
04044	71.0026	77.8585	115.0549	71.8106	111.1752	147.8062	-9.0011	162.4817	380.2315	3591.0779
04045	70.9658	77.8563	115.0925	71.8664	111.1719	148.6721	-8.9831	163.6773	381.1914	3591.5664
04046	70.9561	77.8758	115.0928	71.8339	111.168	148.0412	-8.9605	162.9806	380.7631	3592.8412
04047	70.9676	77.8531	115.1459	71.8231	111.175	148.4633	-9.2716	163.1824	378.7656	3589.6728
04048	70.985	77.8384	115.1666	71.83	111.1817	147.6111	-9.052	162.6923	380.37	3592.3843
04048	70.9698	77.8455	115.1686	71.8316	111.1401	147.9666	-8.9713	163.1647	379.2847	3594.1424
04049	70.9942	77.8755	115.1616	71.8352	111.1567	148.1973	-9.1379	162.8697	380.7797	3590.9576
0405	70.9974	77.8512	115.2757	71.8309	111.1874	148.1825	-8.8457	163.5677	381.3344	3591.7734
04051	70.9666	77.871	115.3311	71.8267	111.2061	148.4397	-8.9543	163.0028	379.9602	3593.5866
04052	70.949	77.8395	115.3523	71.8065	111.2234	148.3966	-9.0032	164.812	381.0696	3592.0648
04052	70.9426	77.8725	115.3371	71.8379	111.2045	148.1508	-8.8442	162.9732	380.6856	3593.3621
04053	70.9561	77.866	115.415	71.8363	111.279	148.2429	-9.3443	164.5186	379.9626	3594.3647
04054	70.9761	77.8665	115.4897	71.8246	111.2651	147.6965	-9.1273	162.7476	381.9488	3592.3944
04055	70.9623	77.8539	115.5399	71.8278	111.2773	148.3441	-9.1066	164.2001	381.4774	3592.4244
04055	70.9929	77.8743	115.5594	71.8502	111.2943	148.2029	-8.9021	163.546	380.5361	3593.0496
04056	70.9617	77.8765	115.5477	71.8202	111.3111	148.0154	-9.4002	163.4369	380.6194	3592.5708
04057	70.9839	77.867	115.6555	71.8252	111.3328	147.6618	-8.9077	162.7724	381.149	3592.9234
04059	70.9637	77.8784	115.7148	71.8124	111.3083	147.8946	-8.9624	163.1435	379.9626	3594.8554
0406	70.9583	77.8804	115.8106	71.8148	111.3538	148.9067	-8.9933	163.4193	380.6882	3592.7931

04061	70.9449	77.8875	115.8084	71.8336	111.3457	148.0533	-9.1351	163.3908	381.5051	3591.7912
04062	70.9568	77.8838	115.7797	71.8884	111.2965	149.8234	-9.17	163.5677	380.5982	3590.6081
04063	70.9615	77.8659	115.8107	71.8436	111.2853	147.8759	-9.1406	163.5534	379.5006	3594.0033
04065	70.9378	77.8672	115.8979	71.8893	111.343	148.4171	-9.5683	163.9212	380.2222	3593.0691
04066	70.9521	77.8845	115.884	71.8673	111.3487	148.9971	-8.9524	161.6945	381.195	3592.8973
04066	70.9628	77.8697	115.9023	71.9217	111.3344	148.3515	-9.0248	163.4758	379.9658	3593.5545
04067	70.9735	77.8727	115.9529	71.9197	111.36	148.0849	-9.1388	162.1676	380.5029	3593.1137
04068	70.9468	77.8568	116.0074	71.8813	111.3807	148.4295	-8.942	162.7158	380.4234	3591.7888
04069	70.9646	77.874	116.0359	71.8972	111.3579	148.305	-9.1779	162.8217	379.8938	3592.5045
0407	70.9712	77.8933	116.0893	71.8744	111.3692	149.2594	-9.209	162.03	379.5654	3592.5018
0407	70.9685	77.876	116.0708	71.8825	111.3651	148.9351	-8.8847	162.6274	380.0421	3592.5018
04071	70.9909	77.9002	116.1266	71.862	111.3635	149.0853	-9.1968	162.9215	379.2681	3592.5206
04072	70.9883	77.9079	116.335	71.8244	111.5146	149.2154	-9.1039	164.008	380.2315	3592.7129
04073	70.9786	77.8762	116.3897	71.7877	111.5142	148.6801	-9.1545	162.9951	379.4436	3591.1678
04074	70.9695	77.8843	116.4574	71.8843	111.5053	147.341	-9.3591	163.5041	381.3927	3591.6584
04075	70.9814	77.9137	116.4691	71.8029	111.5537	147.116	-8.9023	163.073	379.6058	3592.6007
04076	70.993	77.8882	116.5828	71.7552	111.5159	145.962	-8.9648	164.0591	380.3334	3592.7317
04076	70.9954	77.8809	116.5703	71.7742	111.5658	147.2602	-9.1612	163.794	380.9584	3591.6431
04077	70.9927	77.8766	116.5917	71.8055	111.5387	147.9706	-9.2033	162.8254	379.0521	3591.9275
04078	71.0084	77.884	116.6532	71.8099	111.5696	146.8283	-9.196	163.6137	379.3694	3593.0384
04079	71.0215	77.8874	116.6443	71.7911	111.5416	148.0377	-8.7982	162.7017	380.8683	3594.4184
0408	70.997	77.8936	116.6856	71.7991	111.5575	146.9525	-9.335	164.9651	380.5804	3592.8171
0408	71.001	77.9205	116.6639	71.772	111.5324	147.9373	-9.3405	163.2072	378.8345	3590.3168
04082	71.0264	77.9191	116.746	71.7875	111.5547	148.6712	-9.2306	163.4475	380.5347	3591.6278
04082	70.995	77.8967	116.7721	71.7981	111.5314	146.554	-9.1647	162.6295	379.8163	3591.3263
04083	71.0034	77.8995	116.7679	71.7887	111.5247	147.2265	-8.8104	163.1839	382.5406	3594.4602
04084	71.0064	77.9089	116.7882	71.8207	111.5706	147.2158	-9.3981	161.7791	378.5591	3590.8151
04084	70.987	77.904	116.7661	71.843	111.5404	148.7426	-9.3993	164.1078	380.9348	3593.827
04085	70.99	77.8998	116.8159	71.8124	111.5696	147.3633	-9.2709	163.3662	379.38	3594.4414
04086	70.9901	77.8791	116.8361	71.8481	111.5479	148.4685	-9.3587	163.5017	381.184	3594.9331
04087	70.982	77.8991	116.8257	71.8761	111.5363	147.9986	-9.0696	163.695	380.6618	3591.2291
04088	70.9929	77.9074	116.8845	71.8949	111.4961	148.1833	-9.333	163.5978	380.3977	3591.6095
04089	71.0013	77.8903	116.9968	71.8053	111.5485	147.4365	-9.32	163.0065	379.6003	3594.0194
04089	71.0003	77.9052	117.0332	71.7997	111.5811	147.3979	-9.3551	164.8933	380.6777	3590.8458
0409	70.9864	77.8962	117.0712	71.8165	111.5785	147.8058	-9.4268	162.7794	378.5432	3590.2785
04091	71.0064	77.8878	117.1341	71.8152	111.5808	148.1871	-9.3683	164.6067	381.6103	3590.7653
04091	70.9906	77.8822	117.1214	71.8175	111.5906	147.325	-9.0199	164.1262	381.0566	3593.1538
04092	70.9738	77.8908	117.2164	71.8098	111.573	148.2363	-9.3714	162.4595	379.5782	3590.8054
04093	70.9878	77.8972	117.2577	71.8366	111.5768	146.6497	-9.2352	163.6347	381.9869	3592.6729
04093	70.9637	77.9101	117.1923	71.8302	111.532	148.2145	-9.0582	162.8289	379.1629	3591.6968
04094	71.0164	77.9028	117.2598	71.8082	111.5739	145.9474	-9.2931	162.9621	380.6745	3592.6809
04095	70.9857	77.932	117.2703	71.8243	111.5646	148.3718	-9.4623	162.8148	381.5304	3591.4974
04095	70.9927	77.9046	117.27	71.8415	111.5916	146.5874	-9.2599	163.583	380.0488	3593.5866
04097	70.9825	77.9045	117.3232	71.8539	111.5792	147.5774	-9.5192	162.5108	379.3588	3591.8884
04098	70.9549	77.9037	117.3813	71.818	111.5799	147.6218	-9.2665	163.5324	379.8514	3594.2727
04098	70.9647	77.9135	117.3899	71.8414	111.5933	146.7368	-9.7059	163.702	380.6406	3593.6057
04099	70.9899	77.9018	117.3858	71.878	111.5722	148.0607	-9.304	162.9436	379.8661	3592.8091
041	70.9615	77.9117	117.4493	71.8663	111.6159	147.77	-9.6044	163.3612	380.8628	3592.753
041	70.9658	77.9338	117.4585	71.8451	111.6026	148.5559	-9.4899	163.9747	379.484	3592.6087
04101	70.9912	77.9081	117.4721	71.8767	111.6061	147.4662	-9.2733	163.2097	379.8384	3592.2641
04102	70.9681	77.9072	117.4725	71.8769	111.597	147.8617	-9.1489	164.1333	380.8789	3589.7265
04102	70.9947	77.9193	117.507	71.9048	111.6186	147.43	-9.5565	162.3856	378.8417	3593.9953
04103	70.9988	77.903	117.5059	71.8985	111.5748	148.3208	-9.4681	164.3886	380.7853	3591.3263

04105	70.962	77.8995	117.6029	71.8724	111.6344	148.4732	-9.6458	162.7773	379.4342	3592.7209
04105	70.9737	77.9055	117.6445	71.8472	111.635	146.7297	-9.4461	163.7798	381.8535	3594.3954
04106	70.9692	77.9321	117.6934	71.8474	111.6324	147.4643	-9.5844	163.5645	379.783	3591.5588
04107	70.9688	77.9347	117.6993	71.8397	111.6252	147.317	-9.6607	163.3521	381.1543	3593.9814
04107	70.9861	77.896	117.7237	71.8793	111.6712	148.1621	-9.3955	164.7661	380.344	3593.2837
04108	70.982	77.9143	117.7443	71.8533	111.6107	147.8062	-9.6052	163.5941	379.7609	3593.4183
04109	70.9646	77.9046	117.7001	71.9027	111.6091	147.6446	-9.3578	163.7567	380.3312	3594.5644
04109	70.9794	77.927	117.7217	71.9044	111.5505	147.7523	-9.7397	164.1558	380.2149	3593.5305
0411	70.9671	77.9135	117.7713	71.8937	111.5943	146.935	-9.2104	163.7056	378.8027	3594.0427
04111	70.983	77.9356	117.8663	71.9013	111.6653	148.6274	-9.7156	164.4219	381.2061	3594.4762
04111	70.9744	77.9378	117.8996	71.8708	111.6629	145.9851	-9.3361	163.1188	380.0792	3594.8324
04112	70.9883	77.9486	117.9252	71.8542	111.6868	148.5986	-9.5278	163.4462	378.4486	3594.4362
04113	70.9623	77.9303	117.952	71.8816	111.6886	147.3036	-9.6886	163.9784	380.8462	3593.0415
04114	71.0044	77.9316	117.9672	71.938	111.6487	148.1824	-9.8597	162.9178	379.4286	3591.8874
04115	71.0296	77.9344	118.0043	71.88	111.672	147.8493	-9.5045	163.6702	380.2433	3591.5588
04116	70.9942	77.9454	118.0461	71.8886	111.6852	146.592	-9.6727	163.7869	379.8249	3591.9191
04116	70.9891	77.9188	118.0557	71.8879	111.6898	147.1671	-9.4262	162.1269	378.5039	3593.3541
04117	70.9899	77.9247	118.0185	71.8729	111.6725	148.2967	-9.7261	163.6717	380.6247	3593.7068
04118	71.0072	77.9369	118.0495	71.9326	111.691	148.9599	-9.6934	162.8993	380.7797	3594.7007
04119	71.0032	77.9557	118.2308	71.8496	111.7399	147.2971	-9.4611	163.5497	380.071	3594.5965
0412	70.9878	77.9379	118.2136	71.8627	111.7201	146.2707	-9.6219	164.0154	379.4397	3592.9694
04121	70.9738	77.9265	118.2225	71.9587	111.7266	148.8513	-9.637	164.8801	380.2537	3591.7992
04122	71.0032	77.9325	118.2784	71.9108	111.707	146.6213	-9.4777	164.409	380.0739	3592.1414
04123	71.0026	77.9221	118.2505	71.8902	111.6845	148.9906	-9.7736	163.3243	380.4586	3592.3442
04123	70.9947	77.9508	118.3307	71.8812	111.7283	146.8728	-9.5656	164.2818	380.4764	3590.7385
04125	70.998	77.943	118.4776	71.8259	111.7793	147.5182	-9.7794	162.3154	381.2393	3592.6087
04125	70.9906	77.9564	118.5039	71.8016	111.8227	148.84	-9.5607	163.2637	377.4415	3591.4131
04126	70.995	77.9781	118.4364	71.8706	111.7881	147.6343	-9.6585	164.7175	380.4807	3593.1698
04127	70.982	77.943	118.5069	71.8633	111.8306	147.9035	-9.2288	164.0767	380.7306	3593.5904
04127	70.9786	77.944	118.4763	71.845	111.7729	147.2433	-9.7503	163.7234	378.9026	3591.3744
04128	71.0045	77.9191	118.5065	71.8897	111.7798	148.2634	-9.5902	165.6816	379.5389	3596.289
04129	71.0135	77.9573	118.5517	71.8431	111.782	147.4565	-9.4911	165.1726	383.1299	3590.7845
0413	70.984	77.9723	118.7384	71.7629	111.8452	147.4021	-9.6318	162.563	379.783	3592.6969
04131	70.9832	77.9393	118.8281	71.7395	111.8913	147.0523	-9.7261	162.9739	380.095	3591.0681
04132	70.9781	77.9366	118.8064	71.7588	111.9222	146.4818	-9.4364	165.4129	380.7359	3592.5401
04132	70.9809	77.9463	118.8745	71.7411	111.9592	145.7439	-9.3826	163.6902	378.0997	3593.7469
04133	70.9817	77.9675	118.8204	71.7726	111.9725	146.1787	-9.2457	164.141	380.5804	3591.2462
04134	70.9586	77.9537	118.9202	71.7335	112.0483	145.3898	-9.4765	166.226	381.0272	3593.3374
04134	70.9794	77.9677	118.8668	71.7817	112.0943	146.8903	-10.0379	163.1469	379.1961	3590.5489
04135	70.9637	77.932	118.919	71.8006	112.1334	145.795	-9.3222	163.7339	378.7762	3593.3221
04136	70.9799	77.9529	118.8283	71.8267	112.1484	147.652	-9.9288	163.1321	379.0632	3592.2481
04136	70.9654	77.9434	118.9058	71.8336	112.1849	147.8253	-9.5834	165.3281	381.1755	3592.0341
04137	70.9664	77.9371	118.9109	71.8509	112.2379	147.0363	-9.9922	162.8466	381.3874	3593.1151
04138	70.9776	77.9685	118.8983	71.8369	112.2411	147.2024	-9.4078	162.733	378.0554	3592.729
04139	70.9723	77.9453	118.9513	71.8425	112.3017	147.0454	-9.6377	165.7264	380.7244	3592.224
04139	70.9874	77.9434	118.9714	71.8761	112.3225	147.1056	-9.6652	163.9177	379.9732	3592.5554
0414	70.9757	77.9659	119.0433	71.8153	112.445	147.2113	-9.9499	162.7794	380.863	3593.8204
04141	70.9871	77.9728	118.9813	71.8399	112.4095	148.7732	-9.8966	162.6221	377.3466	3592.769
04141	70.9817	77.9573	119.0656	71.8163	112.4364	147.7365	-9.9025	163.7973	379.7941	3591.5588
04142	70.9947	77.9906	119.1161	71.8065	112.5045	147.9205	-9.4982	164.1373	379.7664	3594.8209
04143	70.9799	77.9657	119.1295	71.8406	112.548	146.2372	-9.632	163.2245	381.1009	3593.4022
04143	70.994	77.9622	119.0899	71.8527	112.5276	147.0283	-9.673	163.8222	380.0262	3591.3978
04144	70.9779	77.9662	119.1655	71.7881	112.6342	147.1271	-9.3032	163.8638	380.1651	3591.8794

04145	70.9901	77.9682	119.2058	71.8215	112.6796	146.697	-9.7485	164.566	380.9292	3594.7648
04147	70.9827	77.9583	119.2379	71.8308	112.6975	147.7711	-9.8601	162.4401	377.9658	3593.8357
04147	71.0057	77.9642	119.2205	71.857	112.7064	147.8022	-9.598	163.1541	378.522	3594.6714
04148	70.9991	77.96	119.2991	71.8201	112.7804	145.5924	-9.7063	164.9181	380.773	3589.8261
04149	71.0201	77.9907	119.3003	71.8677	112.8104	148.0954	-9.9513	164.3489	379.4489	3591.8194
0415	70.9973	77.9575	119.2913	71.8731	112.8304	146.7537	-9.7509	163.1728	378.8749	3594.0915
0415	71.007	77.9876	119.2938	71.8681	112.8179	147.8201	-9.9284	164.4588	379.5671	3592.2641
04151	70.9901	77.9886	119.3797	71.8588	112.869	146.9674	-9.6518	163.6975	380.6911	3590.084
04152	71.0091	77.9992	119.3463	71.8488	112.8781	148.2891	-9.8432	165.1584	380.3863	3593.2531
04152	71.0044	77.9723	119.376	71.8474	112.9379	147.1634	-9.6768	164.1928	381.1729	3594.2759
04153	71.0184	77.9598	119.401	71.8973	112.9592	148.1932	-9.801	161.627	379.3323	3591.6584
04154	71.0196	77.9659	119.4462	71.8165	113.0045	146.775	-9.6122	162.9668	381.1385	3590.4165
04155	71.0169	77.9899	119.5297	71.818	112.9967	147.5461	-9.9273	164.7027	379.1795	3594.6766
04155	71.0195	77.9619	119.5313	71.8478	113.0034	147.2767	-9.6724	165.2534	380.3811	3591.2061
04156	71.0384	77.9676	119.4744	71.8967	112.9945	148.8907	-9.669	163.3733	378.7497	3594.0274
04157	71.0089	77.9844	119.5404	71.8712	113.0055	147.5961	-9.8506	163.953	379.7508	3591.4208
04158	71.0095	77.9723	119.5961	71.8961	113.0533	145.8926	-9.5517	164.1595	380.6967	3592.3122
04159	71.0213	77.9749	119.5604	71.8966	113.0735	147.8386	-10.0293	165.0206	381.1067	3594.0197
04159	71.0164	77.9817	119.615	71.8438	113.0872	146.4091	-9.7783	163.3834	379.7221	3591.3263
0416	70.9991	77.9746	119.5874	71.9168	113.0694	148.6987	-9.7597	162.5037	378.4849	3593.6671
04161	71.0021	77.9827	119.5772	71.9022	113.0819	146.5772	-9.8483	162.7256	378.1662	3592.5206
04161	70.9842	77.9866	119.6191	71.8637	113.0652	148.8534	-9.9151	163.9495	381.2762	3592.3561
04163	70.9891	77.9698	119.6931	71.8854	113.1105	149.1011	-9.7068	164.651	380.8517	3588.5051
04164	70.986	77.982	119.7136	71.9089	113.136	146.6961	-9.609	162.6295	376.8428	3592.3202
04164	71.0101	77.9685	119.695	71.8997	113.1149	148.2545	-9.6092	162.1608	380.7783	3595.0547
04165	71.0199	77.9807	119.7512	71.8692	113.1784	147.2362	-9.981	163.9566	380.1851	3592.4864
04166	71.0057	77.9736	119.8186	71.8859	113.1861	148.5884	-10.0732	163.8269	379.8052	3591.2061
04167	71.0072	77.998	119.7381	71.9492	113.1956	148.2818	-9.8391	164.9023	379.8107	3588.6333
04168	70.9853	77.9659	119.8585	71.9012	113.2612	147.1597	-9.818	163.2984	379.3899	3591.9996
0417	70.9975	77.968	119.8095	71.9099	113.2923	147.7811	-10.2257	164.6769	380.0876	3591.8473
04171	70.9884	77.9919	119.8838	71.9193	113.3016	147.4225	-9.7836	164.651	382.9946	3592.4404
04172	71.0101	77.9932	119.938	71.8905	113.3484	146.1629	-9.9203	164.1373	379.34	3592.224
04174	71.0016	77.9771	119.9749	71.9154	113.3929	146.3598	-9.7237	164.736	379.6723	3594.4682
04175	70.9947	77.9932	120.0034	71.919	113.4265	148.6803	-9.971	164.2112	380.9459	3594.0755
04175	71.0118	77.9848	119.9975	71.9334	113.4005	148.7426	-9.8453	164.5808	380.3811	3593.6667
04177	70.9805	77.9853	119.989	71.9412	113.4264	148.4579	-10.0093	163.2319	378.4319	3593.1457
04178	70.983	78.0121	120.0713	71.9325	113.4682	147.9293	-9.6454	163.3132	379.4489	3593.9047
04179	70.9516	77.9985	120.0421	71.9663	113.4453	148.7797	-10.1375	163.8269	381.0511	3591.3905
0418	70.9845	78.0038	120.1253	71.9462	113.4768	148.4126	-9.9952	165.0276	379.6078	3596.266
04181	70.9881	78.0026	120.1014	71.978	113.4552	147.1491	-9.7484	163.7339	379.5548	3593.4064
04183	70.9779	78.012	120.2546	71.8948	113.5405	147.7328	-9.8573	163.0915	378.9801	3592.192
04184	70.982	78.0084	120.2233	71.9267	113.4991	148.0226	-9.8714	163.8712	379.1684	3593.1057
04185	70.9874	77.9751	120.3341	71.9252	113.516	148.9227	-10.1668	164.9322	380.5399	3591.0834
04186	70.981	77.9998	120.3695	71.9255	113.6006	148.4128	-10.0346	164.1817	380.0156	3592.5446
04187	70.9677	78.0069	120.4077	71.8905	113.6089	146.7175	-9.9514	163.3686	380.154	3591.8393
04188	70.9612	78.0221	120.3892	71.9253	113.5617	147.1393	-10.0488	163.7127	379.4542	3594.2037
0419	70.9788	77.9958	120.3901	71.9458	113.5818	147.1687	-9.3644	164.257	379.147	3594.7404
04191	70.9637	78.0148	120.4395	71.9621	113.6073	148.4357	-10.4739	165.3458	381.0378	3595.093
04191	71.0009	78.0146	120.4427	71.9441	113.5964	146.9618	-9.8779	164.481	381.1507	3592.1759
04192	70.9879	78.017	120.4295	71.9738	113.602	148.7032	-10.0415	164.561	379.4171	3593.5674
04193	71.0077	78.0245	120.4639	71.9845	113.6245	148.3078	-10.1332	164.0909	380.3122	3594.9857
04195	70.9896	77.9968	120.509	71.9672	113.5908	148.6961	-9.9186	163.8116	378.4531	3590.0025
04195	70.9981	78.027	120.5141	71.9839	113.5953	149.5266	-10.2325	163.3391	378.6922	3589.8436

04197	71.0116	78.0503	120.5225	72.0127	113.6067	149.1919	-10.2287	165.1054	378.8239	3592.2411
04198	71.0096	78.0216	120.5346	71.964	113.6882	147.0505	-9.8326	164.4868	378.379	3593.8357
04198	71.0086	78.028	120.5245	72.0221	113.6758	149.446	-9.9388	163.9071	380.7518	3595.5684
04199	70.9861	78.038	120.5016	72.0146	113.6379	147.8146	-9.838	164.4478	381.7266	3591.663
042	71.0172	78.0283	120.634	71.9431	113.683	148.6441	-10.0455	164.3147	380.0654	3595.0373
04201	70.995	78.024	120.6292	72.0071	113.6782	148.4137	-10.0523	165.4456	380.2869	3592.1599
04202	70.981	78.037	120.7142	72.0059	113.7246	147.9692	-10.3137	164.6848	381.4245	3592.9541
04202	71.0302	78.0387	120.6568	72.0301	113.6907	148.7992	-10.0186	164.4071	378.886	3591.5187
04203	70.9893	78.0087	120.7226	71.9925	113.7162	147.7151	-9.9664	164.0167	379.7773	3593.1841
04205	70.9818	78.0158	120.7875	71.9368	113.7215	147.9835	-10.3315	163.2885	378.8716	3589.5961
04206	70.9784	78.0343	120.8498	71.976	113.7383	148.7654	-10.0708	163.0552	379.3429	3590.2018
04207	71.002	78.0262	120.9014	71.9604	113.759	147.66	-9.7599	164.9216	380.1533	3590.8381
04207	70.9771	78.0452	120.7493	72.0295	113.6735	149.4976	-10.4166	164.5504	377.7434	3591.5281
04208	70.9674	78.0245	120.81	71.9417	113.6992	147.8146	-10.0688	164.4404	379.3234	3590.7573
0421	71.0013	78.0426	120.9681	71.9431	113.7564	147.2904	-10.0516	164.7342	380.7041	3590.3245
04211	70.9827	78.0067	120.9635	71.9301	113.7779	146.4973	-9.971	164.4293	377.3023	3590.2684
04212	71.0064	78.0525	120.9847	71.9331	113.7946	147.0283	-10.1075	165.0524	382.4308	3592.0188
04213	71.0113	78.0377	120.9997	71.944	113.7866	149.6279	-9.9707	164.008	379.7609	3592.208
04214	71.008	78.0395	121.0189	71.9688	113.8335	147.3445	-9.9155	165.5343	379.5228	3591.5748
04215	71.0126	78.0543	120.9947	71.9951	113.8091	147.5805	-10.0809	164.5475	380.298	3591.4385
04217	71.0269	78.0685	121.0696	71.9798	113.8367	147.4077	-9.8731	163.8528	380.1485	3594.0915
04218	71.0333	78.0698	121.0469	72.0434	113.7939	148.253	-10.2924	163.9488	380.4863	3591.6389
04218	71.0245	78.0413	121.1002	71.9584	113.8481	146.0171	-9.9954	164.0803	379.0675	3592.9234
04219	71.0244	78.0482	121.0756	71.9911	113.8603	148.5642	-9.9714	163.4795	378.9635	3588.6573
0422	71.0425	78.0637	121.178	71.986	113.8528	147.4904	-9.7329	164.1373	381.0954	3591.7912
0422	71.0438	78.0533	121.1397	71.9695	113.8494	147.9204	-10.0019	164.5328	379.2211	3594.3341
04222	71.0057	78.0494	121.1738	71.9702	113.8525	147.8226	-10.042	163.2319	379.2953	3591.9498
04223	71.0108	78.0569	121.1902	71.9991	113.9096	148.7796	-9.9789	165.169	379.1735	3592.6168
04224	70.9998	78.0727	121.2595	71.9332	113.9264	147.5836	-9.872	164.3136	378.5379	3593.4601
04225	71.0251	78.0744	121.2549	71.9599	113.9023	147.8564	-9.9879	164.1041	379.1739	3594.2117
04226	70.9935	78.081	121.2353	72.0501	113.8686	147.8386	-9.9541	163.7303	379.4912	3594.9167
04227	70.9754	78.0679	121.2482	72.0219	113.884	149.1368	-10.1655	164.4868	379.6607	3591.6048
04229	71.0033	78.064	121.3094	72.0135	113.9333	148.115	-9.8564	164.1687	378.2254	3594.5794
0423	70.9999	78.067	121.2687	72.0327	113.8535	148.4407	-10.2516	164.8284	380.082	3591.3664
0423	70.9748	78.093	121.2872	72.0184	113.8821	148.5103	-9.947	163.5867	380.2869	3592.2641
04231	70.9947	78.0603	121.3213	72.0624	113.8614	149.4256	-9.974	165.2291	378.9881	3590.5315
04232	70.9881	78.0706	121.3439	72.033	113.8914	148.8847	-10.0949	163.631	380.8905	3591.0218
04233	70.9929	78.0678	121.3421	72.0465	113.8846	146.9794	-9.8595	164.3147	379.1795	3592.729
04234	70.9894	78.0718	121.3868	72.0283	113.9469	149.0714	-10.0387	163.9747	377.8173	3592.8732
04234	70.973	78.0683	121.4027	72.037	113.9353	148.4927	-9.9887	165.4345	380.7908	3594.9571
04236	70.9884	78.0759	121.4438	72.0278	113.9314	147.7161	-9.9637	166.3288	381.7598	3593.6266
04237	71.0162	78.0757	121.4782	72.0477	113.9685	149.0287	-10.1258	168.3355	379.7443	3594.3159
04238	71.0098	78.0667	121.5177	72.0447	113.968	147.4225	-9.8849	163.6015	381.8263	3594.8209
04239	71.0154	78.0774	121.4732	72.0579	113.996	149.0547	-10.0958	164.6954	379.7775	3592.8492
04241	71.0177	78.0772	121.5896	72.0442	114.0375	148.5772	-9.8231	163.1469	379.1629	3591.5988
04242	71.0065	78.0991	121.582	72.0237	114.0525	148.4184	-9.8567	163.3243	379.1352	3592.4404
04243	71.014	78.0674	121.579	72.0425	114.0407	149.2763	-9.9216	164.5999	378.5855	3591.7734
04244	71.036	78.0747	121.595	72.037	114.0377	148.4722	-10.0643	164.6671	379.041	3593.3681
04246	71.0057	78.1136	121.629	72.0615	114.032	148.8801	-10.0694	165.4419	380.4475	3592.4404
04247	70.9707	78.0762	121.6819	72.0288	114.0275	147.966	-9.7946	166.3362	380.6579	3593.0496
04248	70.9862	78.0737	121.6906	72.0174	113.9874	149.7224	-10.1531	162.988	381.8058	3593.7514
04248	71.0065	78.0891	121.721	72.0217	114.037	147.7213	-9.6848	165.4448	381.0378	3592.2028
04249	71.0013	78.0937	121.7256	72.0704	114.0657	149.5367	-10.0012	164.2606	380.6141	3593.5137

0.425	70.9797	78.0901	121.7132	72.0454	114.0263	149.4356	-10.0291	163.668	378.216	3593.0496
0.4251	70.9863	78.1146	121.7619	72.0161	114.0776	148.0533	-9.8641	163.4832	379.3124	3593.7709
0.4253	70.9981	78.111	121.8169	72.0009	114.1002	147.6362	-9.903	163.2023	379.5006	3591.8874
0.4253	70.9947	78.0968	121.7741	72.0638	114.064	149.566	-10.1151	164.5893	378.8504	3593.1841
0.4255	70.9707	78.0812	121.8416	72.0286	114.0899	147.3947	-9.8233	165.538	380.3423	3592.7129
0.4257	70.9861	78.122	121.9237	71.99	114.1472	148.2214	-10.0583	164.6288	379.9104	3595.5182
0.4258	71.005	78.0976	121.8964	72.0694	114.14	149.5953	-9.9071	163.971	378.8694	3592.8492
0.4259	70.9623	78.0907	121.8744	72.0597	114.0953	147.704	-10.0344	163.8195	378.0831	3590.9096
0.4259	71.0228	78.1128	121.8885	72.0587	114.1019	149.2879	-10.1554	165.4825	380.0267	3592.2481
0.426	71.004	78.1183	121.9192	72.0827	114.1304	148.9902	-9.9007	164.6247	377.7964	3594.633
0.4261	71.0013	78.1034	121.8449	72.0727	114.0751	148.8436	-9.9506	166.1694	379.7878	3592.3254
0.4261	71.004	78.1231	121.9375	72.0551	114.0937	147.9479	-9.9685	166.4982	378.8927	3594.4337
0.4262	71.0098	78.1304	121.9557	72.0738	114.1317	147.7179	-9.6669	165.6673	380.2039	3591.2462
0.4263	71.0295	78.1016	121.8965	72.0465	114.0649	148.9507	-9.9098	163.7012	379.4563	3592.0397
0.4264	71.0292	78.109	121.9201	72.109	114.1187	148.5902	-9.7818	164.5401	378.742	3591.7752
0.4264	71.034	78.102	121.9329	72.0894	114.0867	150.0973	-10.1648	163.8505	378.3101	3594.1577
0.4265	71.0184	78.1278	122.0003	72.0778	114.1543	147.2575	-9.7495	165.3882	378.0453	3592.5478
0.4266	71.0116	78.1112	122.0753	72.0035	114.1696	148.8871	-9.9407	165.0913	381.1967	3592.5708
0.4266	71.008	78.1261	122.0727	72.0352	114.1464	147.5136	-9.9018	165.0132	379.3068	3590.9897
0.4267	71.0218	78.1245	122.06	72.0937	114.1688	149.1132	-9.8488	164.5623	380.37	3592.4244
0.4268	71.0083	78.1263	122.0974	72.0375	114.1637	147.5702	-9.768	165.0021	379.8827	3593.835
0.4269	71.0121	78.1263	122.1293	72.0435	114.1854	148.306	-9.8778	164.1121	379.0251	3590.6235
0.4272	70.9896	78.1429	122.1553	72.08	114.202	149.5029	-9.8077	164.7095	381.5992	3594.3801
0.4272	70.9925	78.1239	122.2713	71.9934	114.2872	147.1553	-9.7641	164.1404	379.4806	3593.2377
0.4273	71.0016	78.1353	122.2403	72.0619	114.2776	149.1173	-9.9963	163.5713	378.8663	3592.1644
0.4274	71.0063	78.1396	122.2172	72.063	114.2714	149.0788	-10.0405	165.6008	379.9325	3589.4188
0.4276	70.9959	78.1322	122.2032	72.0581	114.2261	148.346	-9.753	166.2543	380.9213	3593.1917
0.4276	70.9913	78.1348	122.2583	72.0754	114.3077	147.5641	-9.929	164.3171	380.2063	3591.9804
0.4278	71.0024	78.1434	122.3166	72.0702	114.2784	147.1987	-9.7977	164.7249	378.8362	3594.0595
0.4279	70.9996	78.1699	122.2971	72.0638	114.2484	148.0403	-9.9973	163.2637	378.6544	3592.7241
0.428	70.9557	78.1273	122.2714	72.0929	114.2581	148.0124	-9.999	164.8986	380.4254	3593.6747
0.428	70.9802	78.139	122.3193	72.0832	114.2761	148.6618	-9.8444	165.0427	379.3179	3594.2438
0.4281	71.0047	78.1263	122.2957	72.0574	114.2805	149.2186	-10.2183	164.7024	378.2783	3590.4625
0.4282	70.9922	78.123	122.3343	72.0755	114.2961	147.3557	-9.784	164.2223	377.4297	3592.216
0.4283	70.985	78.1082	122.4598	72.0252	114.3795	147.417	-9.9023	166.0664	378.4984	3593.2179
0.4284	70.982	78.1332	122.4073	72.0736	114.3093	148.8596	-9.8273	165.8225	381.1618	3593.7709
0.4284	70.9817	78.1355	122.4062	72.0622	114.3382	147.0119	-9.5969	166.1958	381.4387	3592.3523
0.4285	71.013	78.137	122.3898	72.0438	114.3342	149.8814	-9.9945	165.2822	379.4012	3592.5554
0.4286	71.0106	78.1337	122.4277	72.0638	114.3522	147.8081	-9.7141	165.2201	380.37	3595.2457
0.4287	70.9937	78.1397	122.4208	72.0951	114.3437	148.7707	-9.9845	165.9078	380.2804	3592.9541
0.4288	71.019	78.1243	122.4406	72.0898	114.3527	149.5452	-10.0398	165.3606	379.556	3592.6648
0.4289	71.0083	78.1288	122.4207	72.0745	114.3753	148.6748	-9.9593	165.0575	379.5117	3592.6248
0.4289	71.0399	78.1419	122.4406	72.086	114.3756	147.7622	-9.9975	163.695	379.433	3591.7964
0.429	71.0121	78.1352	122.4621	72.1016	114.3893	149.3111	-9.8946	164.6991	379.1241	3594.5484
0.4291	71.0182	78.1348	122.5159	72.08	114.3888	147.907	-9.7119	165.6144	381.3397	3592.4021
0.4291	70.995	78.1309	122.4778	72.0921	114.38	149.6381	-9.9247	164.6362	379.0632	3592.5446
0.4292	71.0274	78.1636	122.5301	72.0872	114.3504	148.673	-9.9439	163.854	377.6798	3592.2181
0.4293	71.0124	78.138	122.5507	72.0799	114.4456	148.5447	-9.9457	165.6488	380.6081	3589.9878
0.4294	70.9978	78.1719	122.545	72.0995	114.4173	148.5391	-10.1524	164.821	379.772	3593.2018
0.4295	71.0301	78.1784	122.5946	72.0897	114.4606	147.8289	-9.9065	163.9884	378.9881	3593.6824
0.4297	71.0013	78.1448	122.6693	72.0513	114.5116	147.5392	-9.567	166.7421	381.5092	3593.0844
0.4297	71.003	78.1392	122.6297	72.0694	114.4909	148.9342	-10.0044	164.9181	379.6978	3591.1524
0.4298	70.9925	78.1555	122.6304	72.075	114.5084	149.1164	-9.8288	165.4306	378.0135	3594.0274

04299	70.9862	78.1711	122.6357	72.0975	114.4778	148.7512	-10.064	165.1726	379.862	3594.1424
043	70.9942	78.1785	122.7443	72.0685	114.5271	147.6102	-9.8262	166.8462	380.2537	3592.5927
043	70.9794	78.1968	122.687	72.089	114.5247	150.3822	-9.8525	165.7301	380.071	3593.4503
04301	70.9776	78.1747	122.7249	72.0946	114.5352	147.6353	-9.8178	165.7671	378.3433	3591.9996
04302	70.9889	78.1757	122.682	72.0916	114.4947	149.4133	-9.7702	165.453	379.3677	3590.06
04302	70.9945	78.1599	122.7371	72.0694	114.5556	148.338	-9.7258	166.3108	380.7677	3591.8194
04303	70.9769	78.1612	122.7267	72.0939	114.5245	149.4021	-9.9486	164.5771	378.9026	3592.6488
04305	70.9955	78.1731	122.665	72.1324	114.5216	148.6952	-9.9901	166.3886	380.434	3593.6747
04306	70.9833	78.1804	122.6612	72.1211	114.5058	148.1114	-9.7447	165.9008	379.4012	3590.4318
04307	71.0001	78.2047	122.6668	72.1424	114.5295	150.0849	-9.9369	163.6975	377.6069	3591.687
04307	70.9847	78.1867	122.7498	72.1166	114.5492	148.1478	-9.8419	165.1655	379.5654	3597.301
04309	71.0154	78.1767	122.7172	72.148	114.57	149.3362	-9.9661	166.5432	378.1052	3593.0496
0431	71.014	78.2037	122.7959	72.1051	114.6026	148.2687	-10.0852	165.3776	379.5124	3592.6551
04311	71.0108	78.1908	122.7432	72.0976	114.612	149.5606	-9.6366	165.0276	381.0325	3593.3911
04311	71.017	78.1986	122.7637	72.1446	114.6242	147.1606	-9.8328	164.9208	379.0078	3594.5644
04313	71.0022	78.1507	122.9121	72.0946	114.6654	147.6158	-10.0107	165.3421	379.2127	3594.1636
04314	71.0185	78.1798	122.8674	72.0923	114.6531	149.0696	-9.7366	166.2512	378.9635	3593.5465
04314	71.0292	78.2042	122.9351	72.1009	114.7086	148.1478	-9.8966	164.0944	378.6279	3595.231
04316	71.0209	78.1667	122.9205	72.1251	114.7012	147.5356	-9.8692	164.6353	380.3175	3592.9617
04317	71.005	78.1943	122.8545	72.1327	114.6376	148.8067	-10.0712	163.328	378.3489	3593.3782
04318	70.9986	78.1726	122.8008	72.1646	114.6113	148.9376	-9.8674	165.5343	379.4563	3595.3178
04319	71.0148	78.1996	122.883	72.1453	114.6803	149.2576	-9.7203	164.6954	377.8546	3592.2871
0432	71.018	78.192	122.9313	72.1194	114.6772	148.3914	-9.9023	165.2756	379.8163	3593.9553
0432	70.995	78.1896	123.0026	72.0675	114.7477	147.8537	-9.6064	165.1408	379.237	3594.5564
04321	70.9815	78.1938	122.9972	72.1256	114.7508	149.1959	-9.9391	164.7951	378.8583	3590.7332
04323	71.005	78.1874	123.0012	72.1099	114.7271	149.0551	-9.7708	163.9212	379.9732	3590.9148
04324	71.0006	78.2074	123.0067	72.1449	114.7398	149.4647	-10.0079	165.0453	378.2836	3592.0954
04325	70.9881	78.1877	123.0045	72.1508	114.7255	147.2646	-9.8494	164.9836	380.2039	3593.3141
04326	70.9725	78.2103	123.0738	72.1018	114.7875	147.5284	-9.8974	164.6621	378.7697	3591.0378
04329	71.0233	78.2008	123.0933	72.1456	114.8051	147.6378	-9.8869	166.9436	379.952	3592.8007
0433	71.0374	78.2062	123.1492	72.1585	114.8306	149.5108	-9.894	165.0982	379.2072	3593.8671
04331	71.0294	78.2118	123.1313	72.1332	114.8145	147.5463	-9.4505	165.2786	378.612	3595.1544
04332	71.028	78.1917	123.0872	72.1564	114.811	148.8095	-10.207	165.1019	379.4065	3592.1278
04332	71.026	78.1962	123.0856	72.1475	114.8118	148.5335	-9.708	164.4196	379.2317	3592.2718
04333	71.0257	78.2098	123.0621	72.1485	114.8258	149.4504	-10.048	165.1795	380.0765	3592.1278
04334	71.0272	78.2144	123.1396	72.1832	114.83	149.4105	-9.8833	165.268	379.2052	3591.6508
04336	71.0091	78.206	123.1572	72.1513	114.8236	147.9279	-9.8257	163.8491	379.3234	3591.4305
04337	71.0265	78.221	123.2344	72.119	114.8485	148.1505	-9.6642	164.8792	379.8196	3593.4984
04338	71.0052	78.2429	123.216	72.1452	114.8901	147.8406	-9.8415	164.9577	379.2902	3595.2777
04339	71.0062	78.2083	123.2435	72.1196	114.8626	148.7639	-9.9552	165.5453	379.6224	3594.6205
04339	71.0245	78.2215	123.257	72.1153	114.9047	148.7272	-9.8325	166.5052	377.9182	3591.2521
0434	71.0239	78.2131	123.2423	72.1618	114.9089	148.188	-9.8498	165.0058	379.4342	3590.2123
04341	70.9996	78.2235	123.28	72.1119	114.9158	148.5504	-10.0365	164.9216	378.7285	3592.3868
04341	70.9917	78.2167	123.3101	72.1368	114.942	147.9186	-9.7402	166.3325	380.9348	3593.5305
04342	70.9983	78.208	123.2747	72.1312	114.9365	148.9005	-10.0392	164.7138	379.2072	3594.1075
04343	70.9825	78.2177	123.2939	72.1738	114.9332	149.9613	-9.8303	166.7501	378.6313	3592.3202
04344	70.9896	78.2403	123.2823	72.1485	114.9037	148.0599	-9.7834	165.3651	378.7074	3592.0954
04345	71.0084	78.2201	123.353	72.1817	114.9674	148.3655	-9.8523	165.5508	379.3588	3595.6144
04348	71.0114	78.2439	123.3932	72.1937	115.0253	148.645	-10.0734	165.1832	379.1241	3593.5866
04349	71.003	78.2439	123.2943	72.1998	114.9804	149.4522	-9.876	165.4023	380.6724	3592.6551
0435	70.9994	78.2243	123.2949	72.2284	114.9342	149.6288	-10.0723	164.8727	378.9912	3591.2302
04351	70.9979	78.2339	123.353	72.2062	115.0034	149.5784	-9.9133	164.8544	380.6353	3590.5315
04352	71.0195	78.2419	123.4097	72.1595	114.9918	147.587	-9.7729	164.4958	377.6346	3594.9331

04352	71.0226	78.2244	123.4513	72.1993	115.011	149.0097	-10.1427	165.2716	380.2063	3594.7174
04353	71.0494	78.2182	123.4693	72.1796	115.034	149.3241	-9.9363	165.1943	377.629	3592.8171
04354	71.0243	78.2408	123.432	72.1967	115.0108	150.0111	-9.8182	165.4907	379.8726	3593.4524
04355	71.0233	78.2126	123.516	72.1585	115.0884	147.4904	-9.8685	164.7101	380.0156	3594.5804
04356	71.0282	78.2447	123.5504	72.1566	115.0673	148.083	-9.7565	165.8513	379.2317	3592.2411
04357	71.0139	78.2388	123.5398	72.1905	115.0447	149.5257	-10.0822	165.5343	377.5128	3591.2863
04358	71.0532	78.2296	123.5517	72.1746	115.1392	149.2228	-9.9097	166.1219	379.4453	3591.9916
04359	71.028	78.2452	123.4631	72.1784	115.0303	148.92	-10.0512	164.2519	379.1186	3591.5908
04359	71.0308	78.2556	123.3736	72.2374	115.0431	149.9734	-9.8937	165.9297	380.3091	3589.1382
0436	71.0282	78.2327	123.3974	72.2516	115.0646	150.1397	-10.0434	165.3273	379.0023	3589.4669
04361	71.0255	78.2371	123.2727	72.2461	115.0042	148.0386	-9.8391	165.2963	377.3832	3593.0537
04361	71.0239	78.2182	123.3275	72.2617	115.0795	149.4226	-10.1416	165.7412	378.216	3590.7653
04362	71.0314	78.2502	123.3368	72.2555	115.0709	148.2465	-9.7084	164.6635	378.9881	3590.3705
04363	71.0249	78.2498	123.2955	72.2954	115.0374	149.5117	-10.0791	166.0221	379.772	3593.1457
04364	71.0184	78.2447	123.368	72.2679	115.095	148.5468	-9.8493	165.4907	379.004	3596.059
04365	71.0144	78.2622	123.3334	72.2805	115.0679	149.4699	-10.4707	165.8484	378.7974	3591.8233
04366	71.0053	78.2607	123.4453	72.2518	115.1223	149.725	-9.8862	165.6392	379.9997	3591.3058
04366	71.03	78.2523	123.4826	72.2417	115.1249	149.6501	-10.2515	164.6362	380.2315	3593.9232
04367	70.9781	78.2361	123.6225	72.1937	115.1755	147.6814	-9.8704	166.1058	378.7815	3593.1841
04369	70.983	78.264	123.5895	72.2643	115.2022	149.3482	-10.0071	165.2608	378.2935	3593.3221
0437	70.9965	78.2763	123.4747	72.2428	115.1374	149.2408	-9.6366	164.9075	380.1957	3591.8731
04371	70.9876	78.2737	123.7755	72.1432	115.2761	148.4332	-9.8643	165.4677	378.3378	3591.8553
04372	70.9991	78.2546	123.8205	72.1716	115.3454	149.0124	-10.0316	166.0139	378.8504	3592.8007
04373	71.0336	78.2839	123.8241	72.147	115.2974	148.0635	-9.8834	166.0184	378.4375	3591.6469
04374	70.9968	78.2701	123.7817	72.1878	115.3499	148.5131	-9.9323	165.2645	377.4961	3593.6106
04375	71.0055	78.2683	123.8556	72.1417	115.3399	147.3872	-9.8412	163.7869	378.5432	3593.1841
04375	71.0065	78.2887	123.7835	72.212	115.3251	149.398	-10.1481	165.4518	379.719	3593.1304
04376	71.0193	78.2798	123.7997	72.1909	115.3254	147.8656	-9.6993	164.7323	378.8915	3593.1137
04377	71.0333	78.2531	123.7907	72.1766	115.3589	149.8824	-10.0129	165.6488	379.5283	3594.0755
04377	71.0089	78.2571	123.8035	72.1909	115.3212	147.2264	-9.7762	164.9428	378.1089	3593.6901
04378	71.0249	78.2752	123.8486	72.2128	115.3895	148.306	-10.2173	167.1714	379.5726	3591.2863
04379	71.0258	78.2641	123.8126	72.1978	115.3423	147.5285	-9.6136	165.01	378.5591	3591.0604
0438	71.0241	78.2948	123.763	72.2121	115.3262	149.1355	-10.0855	166.5136	379.5948	3591.0939
0438	71.0416	78.2751	123.8413	72.2052	115.4117	148.681	-9.7834	164.7166	378.7338	3593.9277
04381	71.0052	78.2802	123.805	72.2413	115.3012	149.4825	-10.0349	165.9785	379.1311	3596.2123
04382	71.0167	78.2645	123.8274	72.2294	115.3832	149.8647	-9.9652	167.0827	378.9635	3592.3763
04384	71.056	78.2773	123.8859	72.2093	115.4302	150.403	-10.1448	166.53	378.8133	3592.5478
04384	71.0573	78.2745	123.901	72.1975	115.432	147.9149	-9.8325	165.5712	378.3212	3593.1457
04385	71.0234	78.3093	123.9566	72.1906	115.4602	148.7008	-9.9032	164.5217	379.0023	3592.9374
04386	71.0282	78.2787	123.9797	72.1783	115.4644	148.4473	-9.7947	166.5653	378.1459	3590.7385
04386	71.0425	78.2928	123.9536	72.1825	115.4147	149.0584	-9.9848	165.9777	379.0632	3593.5305
04388	71.0188	78.2793	123.9785	72.1952	115.4597	148.2651	-10.028	166.8499	378.9081	3592.0878
04389	71.0443	78.2875	123.9919	72.2176	115.479	148.4677	-10.0624	166.2684	379.0146	3590.9608
0439	71.0264	78.2946	124.0147	72.1326	115.5136	148.9832	-10.178	166.0738	379.113	3591.7111
04391	71.0346	78.2924	124.0279	72.1568	115.5271	148.5619	-9.9901	165.8407	380.1268	3591.5281
04392	71.0282	78.2739	123.9932	72.2337	115.5163	149.7206	-10.0471	165.9184	378.1989	3592.5708
04393	71.0394	78.2872	123.9671	72.2141	115.5158	149.2869	-9.9593	164.603	379.1795	3591.655
04393	71.0346	78.3231	123.9825	72.2452	115.5438	149.9651	-10.2158	165.5417	377.8118	3590.06
04394	71.0162	78.2717	123.9968	72.2007	115.563	148.649	-9.8977	165.8477	379.094	3590.7231
04395	71.0134	78.2816	123.998	72.2177	115.5744	148.6051	-10.008	165.5158	378.5704	3594.2358
04395	71.0062	78.2885	124.0458	72.1946	115.5977	148.6721	-9.6402	166.5532	380.1745	3590.1251
04396	70.9986	78.2999	124.0679	72.2049	115.6319	148.8243	-10.0824	166.1662	377.8948	3594.6526
04397	70.9979	78.2875	124.0372	72.2127	115.5963	149.0622	-9.8804	165.0206	379.4065	3592.0111

0.4398	70.9917	78.3032	124.1337	72.1957	115.5929	148.2354	-9.7303	165.294	380.0765	3594.7808
0.4399	70.98	78.3068	124.1065	72.2062	115.6031	148.3292	-9.9856	165.879	379.9048	3594.3079
0.44	70.9926	78.2919	124.1159	72.203	115.6322	148.2189	-9.7734	166.4805	378.0983	3594.0197
0.4401	70.9955	78.2899	124.0374	72.2838	115.6229	149.327	-9.6757	166.3391	380.1162	3591.3134
0.4401	71.0022	78.306	124.0207	72.2588	115.6171	149.9483	-10.0388	166.4803	377.2636	3591.4305
0.4402	71.0004	78.3094	124.062	72.2503	115.626	148.9991	-10.0135	165.6356	379.2264	3593.9354
0.4405	70.982	78.3139	124.101	72.2593	115.6602	149.8452	-9.9718	165.4086	378.9746	3591.7832
0.4406	70.9922	78.3037	124.1843	72.2246	115.7087	147.6139	-9.9297	166.6651	379.8772	3590.9176
0.4407	71.0297	78.307	124.2447	72.2419	115.7542	147.7604	-9.821	166.834	379.4595	3591.7811
0.4408	71.0204	78.2977	124.2278	72.2222	115.7229	149.3527	-10.0924	166.0351	378.898	3594.2421
0.4409	71.0277	78.3196	124.2288	72.2476	115.688	148.2269	-9.9502	164.9393	378.7338	3593.2837
0.4409	71.0244	78.3052	124.2729	72.2284	115.7625	147.6724	-10.0173	166.8203	381.9758	3589.9958
0.441	71.0417	78.3175	124.3118	72.1533	115.7715	147.4588	-9.903	166.1108	378.1052	3597.546
0.4411	71.0068	78.3259	124.2556	72.2362	115.7502	147.9205	-9.9701	166.8691	378.1163	3590.1882
0.4412	71.0297	78.3167	124.2238	72.2962	115.738	149.9489	-10.1754	166.1765	379.38	3592.8467
0.4413	71.0652	78.2951	124.2953	72.236	115.7875	149.7319	-9.9109	165.9814	379.8384	3592.0156
0.4414	71.0524	78.3101	124.2862	72.2233	115.7934	147.7569	-9.9007	165.1266	378.1353	3592.4864
0.4415	71.029	78.3149	124.2978	72.2564	115.8075	149.6065	-10.0561	166.3953	379.7609	3591.158
0.4416	71.0368	78.314	124.2932	72.2208	115.8388	148.1958	-10.0023	166.1623	378.7444	3594.0581
0.4416	71.0407	78.3241	124.4065	72.2273	115.8616	148.3868	-10.037	165.161	378.3544	3592.6007
0.4417	71.0336	78.3157	124.4564	72.1851	115.9234	149.6833	-9.7885	165.7099	379.6237	3592.1951
0.4418	71.0277	78.3035	124.4379	72.2083	115.893	147.4885	-9.9304	165.8595	379.855	3592.6568
0.4419	71.0241	78.3126	124.4369	72.2201	115.9196	148.868	-10.0975	165.6636	379.7	3592.8893
0.442	71.0206	78.3321	124.3789	72.2255	115.8434	149.8334	-10.0497	164.508	379.6607	3592.3331
0.4421	71.0192	78.3233	124.4664	72.2173	115.9143	148.9733	-10.1172	165.9043	380.8948	3593.7361
0.4422	71.0231	78.3091	124.4233	72.2087	115.9059	149.979	-9.9016	164.2482	377.6567	3593.0255
0.4422	71.0226	78.2902	124.4301	72.2535	115.9187	148.3913	-10.062	165.8159	378.6703	3593.2607
0.4424	71.0223	78.3264	124.3319	72.3043	115.9038	149.2354	-10.0221	166.1871	378.8133	3593.7974
0.4425	71.0142	78.3333	124.3407	72.2825	115.8756	149.7941	-9.6739	165.2238	379.4563	3591.9916
0.4426	71.0123	78.3359	124.3724	72.2725	115.9181	147.9639	-9.93	166.3709	379.2582	3590.6465
0.4428	71.0198	78.3159	124.446	72.3804	115.9587	149.8294	-9.6155	165.9038	379.401	3593.3782
0.4428	71.0153	78.3389	124.5885	72.2227	116.0369	147.509	-10.1009	165.3458	378.5802	3590.4931
0.443	71.0037	78.3203	124.5497	72.2564	116.0352	149.1476	-10.0927	166.0406	379.2072	3593.7869
0.4432	71.0282	78.3372	124.5151	72.2696	116.0039	149.6424	-9.9172	166.4451	378.0559	3590.4241
0.4433	71.0136	78.3323	124.5263	72.3177	116.0534	147.6325	-9.9711	165.3705	378.8292	3593.2224
0.4434	71.0504	78.335	124.5153	72.2796	116.0352	147.8893	-10.0603	165.5649	378.1565	3592.5478
0.4435	71.0328	78.3518	124.6038	72.2301	116.0895	149.1829	-10.0297	165.6156	380.0211	3593.4824
0.4436	71.0349	78.3335	124.6001	72.2621	116.0858	147.6771	-9.7869	166.4434	377.7841	3593.5144
0.4436	71.0298	78.3361	124.5225	72.3205	116.0355	149.3074	-10.1451	165.0058	378.1883	3594.2037
0.4437	71.0321	78.3484	124.5265	72.3886	116.0799	148.3851	-9.9599	168.0853	379.38	3592.0188
0.4438	71.0469	78.3378	124.5732	72.2855	116.1088	149.6148	-10.1787	166.6725	376.9313	3591.7351
0.4439	71.0426	78.3564	124.5947	72.2705	116.1029	148.3487	-9.9755	165.314	378.3472	3592.2718
0.4439	71.0379	78.3569	124.619	72.2686	116.1172	149.1615	-9.9582	166.3916	379.8218	3591.9996
0.444	71.052	78.3429	124.7078	72.2421	116.1888	147.5405	-9.9631	165.039	378.2658	3592.6007
0.4441	71.0354	78.3544	124.6647	72.2516	116.1355	149.5619	-10.08	167.589	377.9945	3592.5286
0.4441	71.0326	78.3659	124.6696	72.2422	116.178	148.984	-10.0509	166.4063	378.6703	3592.8544
0.4442	71.0356	78.3266	124.6978	72.2498	116.1788	149.2451	-10.0493	166.4914	379.8993	3593.2179
0.4443	71.0282	78.3371	124.6864	72.261	116.1823	148.8596	-9.8667	165.549	378.7033	3592.1519
0.4444	71.0287	78.3605	124.7131	72.2526	116.2366	148.2493	-10.1307	165.1758	379.0632	3590.2042
0.4445	71.0167	78.3358	124.6714	72.3019	116.1648	149.7189	-10.0265	166.2106	378.4375	3592.1519
0.4445	71.0018	78.3401	124.6651	72.3011	116.1755	150.0316	-10.5561	165.9114	378.8557	3593.0384
0.4446	71.0009	78.3556	124.6168	72.3072	116.1325	148.7519	-9.7402	166.1403	377.5238	3592.7931
0.4447	71.0102	78.3508	124.6281	72.3316	116.1723	149.3749	-10.5415	166.3391	380.0686	3593.2301

0.4448	71.0254	78.3546	124.6048	72.3256	116.1831	148.1062	-9.7604	164.2815	378.0222	3592.1759
0.4448	71.0193	78.3409	124.6834	72.3167	116.2443	149.2814	-10.5773	165.4382	377.6014	3592.0317
0.4449	71.005	78.3521	124.7235	72.2709	116.2321	148.2735	-9.9291	166.3584	379.772	3593.1618
0.445	71.015	78.3727	124.7333	72.2805	116.261	149.9481	-10.1431	166.3214	378.0029	3592.4251
0.445	71.0075	78.3652	124.726	72.2999	116.2824	147.5818	-10.2142	166.0294	378.9404	3591.6584
0.4452	71.0128	78.3632	124.7217	72.3052	116.2757	148.2314	-9.7523	166.1553	379.0728	3592.9081
0.4453	71.0236	78.3605	124.6734	72.3447	116.2368	148.7602	-10.3016	166.3879	378.4043	3592.1599
0.4454	71.0077	78.3654	124.7575	72.2809	116.3092	149.3536	-10.3716	167.3359	380.8789	3593.4831
0.4455	71.0063	78.3432	124.7475	72.3006	116.2837	148.0505	-10.0267	165.6266	378.3046	3590.3164
0.4456	71.039	78.3758	124.7555	72.3088	116.3067	149.5963	-10.2199	166.0221	378.2326	3591.8072
0.4456	71.0294	78.3846	124.8605	72.2667	116.3575	148.1638	-10.2004	166.1341	379.3165	3592.9387
0.4457	71.0429	78.3591	124.7381	72.3221	116.2778	149.2923	-9.9442	166.325	378.9033	3592.5524
0.4458	71.0316	78.3674	124.8158	72.3112	116.3557	148.4037	-9.666	165.1867	378.5273	3594.8707
0.4458	71.0356	78.3826	124.7602	72.3315	116.3114	149.2479	-10.0651	166.3695	378.5648	3590.1321
0.4459	71.0333	78.332	124.7367	72.3206	116.329	148.2634	-9.9091	166.3992	379.3429	3587.1735
0.446	71.0285	78.3933	124.6836	72.3552	116.3347	149.4235	-10.2845	166.5875	377.4685	3590.4848
0.446	71.0487	78.3795	124.7128	72.345	116.3123	148.354	-9.9358	167.9758	380.8418	3593.0767
0.4461	71.0382	78.3572	124.7559	72.3322	116.3521	149.9781	-10.001	166.4027	379.8107	3590.0359
0.4462	71.0382	78.352	124.7808	72.3511	116.3661	147.8804	-9.8223	165.7735	378.808	3591.9344
0.4462	71.0563	78.3603	124.8388	72.2957	116.3668	150.0636	-9.8882	167.0213	378.5432	3592.2028
0.4463	71.0035	78.3684	124.8181	72.3192	116.402	148.2484	-10.0455	163.6199	379.03	3592.6648
0.4464	71.0138	78.3472	124.7858	72.3611	116.3879	150.4972	-10.0972	166.1093	379.29	3595.4534
0.4465	71.0142	78.379	124.7896	72.3693	116.4059	149.3529	-10.0615	165.3901	377.7232	3594.8209
0.4465	71.0231	78.3808	124.8836	72.3049	116.4477	149.2239	-9.9982	166.0103	379.5389	3593.4064
0.4466	71.0204	78.3805	124.8948	72.3336	116.4566	149.191	-9.8256	166.1129	379.9785	3591.8194
0.4467	71.017	78.3698	124.9411	72.2832	116.491	149.382	-10.1063	166.1659	380.3493	3592.8007
0.4468	70.9917	78.405	124.935	72.3241	116.4942	148.9534	-9.8461	166.5247	379.2348	3592.3202
0.4469	71.0204	78.4024	124.9072	72.3511	116.4475	150.0947	-10.1046	166.0775	377.3991	3592.1721
0.4469	71.0211	78.4038	124.9392	72.3054	116.5085	148.201	-9.55	165.6119	378.0277	3591.3744
0.447	71.0314	78.3939	124.9084	72.3279	116.4989	149.9081	-10.315	165.6392	379.6766	3591.1754
0.4471	71.0308	78.3803	124.9318	72.2927	116.501	149.142	-9.4874	164.9023	380.3534	3593.266
0.4472	71.0331	78.4005	124.9986	72.3201	116.5343	148.5317	-10.1692	165.0241	379.1046	3592.1338
0.4473	71.0351	78.4122	125.0262	72.2776	116.5764	148.1398	-9.5901	165.4306	378.5167	3592.0494
0.4473	71.0788	78.3951	125.0053	72.3041	116.5523	149.3938	-10.2965	164.0154	379.6224	3592.745
0.4474	71.0471	78.3814	125.0038	72.3307	116.5858	148.7593	-9.6778	165.4086	379.2736	3591.4065
0.4475	71.0041	78.3959	124.9177	72.3716	116.5321	150.594	-9.9859	164.8686	378.0718	3590.6388
0.4475	71.0563	78.3773	124.9435	72.3077	116.5245	147.6112	-9.8258	165.7806	377.3832	3593.1151
0.4476	71.0459	78.3597	124.9672	72.3341	116.5491	149.1671	-10.2324	166.3769	378.9912	3592.5286
0.4477	71.067	78.4063	125.069	72.2646	116.6061	148.6088	-9.9692	164.6251	378.8251	3592.4324
0.4478	71.0612	78.4041	125.0248	72.4129	116.5822	150.0316	-10.0775	165.6639	378.2519	3591.8961
0.448	71.0397	78.4122	125.0642	72.321	116.6188	147.665	-9.7882	165.5158	378.2381	3591.5828
0.448	71.0473	78.3927	125.1262	72.3286	116.6719	149.5962	-9.8688	165.7134	378.861	3592.0571
0.4482	71.0374	78.3971	125.2175	72.3018	116.7276	148.0654	-9.8788	164.8247	378.288	3594.2598
0.4483	71.0527	78.3932	125.1682	72.3179	116.6566	149.4727	-9.8991	166.1235	378.9298	3590.8841
0.4484	71.0509	78.3915	125.203	72.2754	116.7322	148.0519	-9.9585	167.0001	379.8832	3591.4974
0.4484	71.005	78.4163	125.2082	72.293	116.735	149.534	-10.1912	166.233	379.7455	3593.9124
0.4485	71.0004	78.3984	125.2153	72.2842	116.7228	148.4741	-9.9767	164.1336	377.9613	3594.4762
0.4486	71.0116	78.4045	125.1776	72.381	116.7226	150.044	-10.0666	166.8868	378.9026	3593.4663
0.4486	71.0106	78.4111	125.2707	72.3231	116.7609	147.4922	-9.7321	166.4212	379.5615	3588.6333
0.4487	71.0172	78.4285	125.2118	72.3187	116.6956	149.3883	-10.0949	166.4593	378.2995	3592.8621
0.4489	71.0048	78.3844	125.1756	72.3426	116.7023	147.8217	-10.1177	166.18	378.6544	3593.9124
0.449	71.0395	78.4312	125.2418	72.3665	116.7424	149.1821	-10.2752	165.7205	378.5485	3590.8151
0.4491	71.0087	78.4005	125.212	72.3653	116.7484	150.0458	-10.0183	165.8442	378.1936	3594.1041

04493	71.0162	78.404	125.3607	72.3105	116.8387	149.155	-10.3367	166.4655	378.371	3593.5705
04494	71.0229	78.4005	125.3365	72.3369	116.8369	149.3919	-9.8279	165.7597	378.0554	3592.5687
04495	71.0525	78.4223	125.292	72.3167	116.8421	148.8206	-10.2099	165.708	377.8838	3594.5223
04495	71.0602	78.408	125.3351	72.3619	116.7953	148.29	-9.9325	165.8407	379.1787	3591.9344
04496	71.0599	78.4221	125.3334	72.3542	116.8239	149.1114	-10.2379	165.9666	379.2958	3592.9614
04497	71.0468	78.3995	125.2795	72.3733	116.785	149.6406	-10.1239	166.1447	379.2158	3592.8697
04498	71.0727	78.4221	125.3731	72.3513	116.8786	149.0101	-9.9363	164.6806	377.4574	3591.142
04499	71.0395	78.4297	125.3569	72.3501	116.8799	150.4481	-10.182	165.6156	377.2248	3591.703
045	71.0373	78.4314	125.362	72.3186	116.9108	148.6437	-9.9434	167.1839	377.1502	3594.1194
045	71.0502	78.42	125.3291	72.3899	116.8922	149.9267	-9.9428	166.7421	378.9404	3593.0997
04501	71.0612	78.4081	125.3903	72.3716	116.8909	149.0603	-10.1032	167.1566	379.4231	3594.2759
04502	71.0599	78.4043	125.3893	72.3832	116.8974	150.4277	-10.1155	165.6193	377.6235	3594.6606
04502	71.0311	78.4137	125.3761	72.3647	116.9542	148.4537	-9.9705	166.6282	378.5205	3591.7271
04503	71.0429	78.4127	125.4772	72.3218	116.9498	148.7867	-10.1392	166.3426	377.6745	3594.8554
04505	71.0609	78.4384	125.426	72.3825	116.9692	150.3877	-10.1686	166.0664	378.4762	3593.9633
04506	71.0551	78.4427	125.4364	72.3371	116.9247	151.7152	-10.134	166.521	378.6922	3592.224
04507	71.0522	78.4438	125.3897	72.3664	116.972	155.0306	-10.1896	169.1317	376.8483	3592.4941
04508	71.0351	78.4268	125.3517	72.4155	116.9507	156.4034	-9.921	170.991	377.4733	3593.9201
04509	71.0226	78.4363	125.3787	72.382	116.9945	160.1558	-10.2376	174.4305	376.6788	3593.6134
04509	71.0254	78.4132	125.4641	72.3501	117.055	160.294	-10.2208	176.7947	376.2503	3593.0736
0451	71.0382	78.4412	125.4542	72.3604	117.0175	163.0567	-10.4246	178.746	377.7675	3593.29
04511	71.0484	78.4386	125.4845	72.3608	117.068	163.483	-10.3187	180.4016	376.588	3589.7153
04512	70.9992	78.4518	125.5826	72.3565	117.1512	165.8843	-10.2346	181.6418	375.4871	3591.6431
04514	71.0507	78.4326	125.5431	72.3404	117.1379	166.9816	-10.1276	183.9218	375.8367	3593.1611
04516	71.027	78.4528	125.5359	72.3818	117.1928	169.3807	-10.2339	185.4383	375.9956	3592.7241
04517	71.0402	78.4514	125.8356	72.2786	117.3787	169.5807	-9.9611	185.6044	382.8439	3591.3594
04518	71.051	78.4615	125.9011	72.2104	117.4158	167.7478	-9.8619	185.169	391.9484	3591.1019
04519	71.0214	78.4346	125.9188	72.2107	117.486	169.4338	-10.0951	185.3574	397.5521	3593.0015
0452	71.0446	78.4272	125.9251	72.2273	117.4223	170.9861	-10.1131	184.6109	407.2699	3592.4404
0452	71.0585	78.4599	125.7441	72.3045	117.3538	170.3999	-10.064	185.5832	408.6114	3592.8544
04521	71.0495	78.4363	125.5984	72.3531	117.2412	170.0703	-10.1655	185.4524	412.3083	3590.6311
04522	71.0518	78.447	125.5713	72.3935	117.27	170.7539	-10.0626	184.744	413.7873	3592.2721
04523	71.0651	78.447	125.6127	72.3824	117.2747	169.8881	-10.0441	186.4811	413.6589	3593.5751
04524	71.0576	78.4467	125.5898	72.4053	117.2756	170.9819	-10.1886	186.3149	414.7977	3591.8884
04525	71.0451	78.4489	125.5862	72.3918	117.2912	173.2202	-10.1172	188.4288	413.5636	3592.0188
04526	71.039	78.4547	125.6139	72.409	117.3128	173.4943	-10.0903	187.8446	412.2479	3592.4565
04526	71.0111	78.4498	125.6763	72.3937	117.3778	177.236	-10.1618	187.9	413.7817	3593.298
04527	71.0441	78.4547	125.6553	72.4106	117.3318	174.1826	-9.9924	188.8941	412.0209	3593.1297
04528	71.0487	78.4669	125.6665	72.3889	117.3655	172.544	-9.9499	187.7078	414.042	3589.6592
04529	71.0527	78.4492	125.647	72.3833	117.3904	174.5663	-9.9887	190.4154	413.3888	3591.3671
0453	71.0461	78.4669	125.6852	72.3978	117.3493	174.0953	-10.0991	189.8254	412.4417	3593.4343
04531	71.0403	78.461	125.6855	72.4236	117.4195	175.3921	-10.3003	190.9526	413.1228	3591.3103
04532	71.0216	78.4399	125.7104	72.3751	117.427	176.7075	-10.1693	191.1447	411.8437	3593.5705
04532	71.0068	78.4837	125.7588	72.3761	117.4881	175.1821	-10.0102	191.1928	412.9954	3592.6729
04533	71.0099	78.4601	125.7064	72.3586	117.4428	177.5083	-10.2747	191.9496	410.2321	3594.1654
04534	71.0004	78.4544	125.7136	72.3886	117.4928	177.7247	-10.2382	192.0834	412.4472	3589.2344
04535	71.0134	78.4852	125.7605	72.3856	117.4773	177.681	-10.3976	193.5801	408.9422	3592.1599
04536	71.0032	78.4547	125.7912	72.348	117.5281	178.7902	-10.2544	193.558	412.3088	3594.1717
04536	71.0055	78.4824	125.8951	72.3753	117.6098	178.1473	-10.0385	194.9512	410.3265	3594.7407
04537	71.0395	78.492	125.8058	72.3677	117.5665	180.3873	-10.1249	194.7775	408.6432	3592.1338
04538	71.0099	78.4699	125.8073	72.3618	117.6037	180.2531	-10.3278	196.0183	410.0202	3593.9507
04539	71.0191	78.4577	125.769	72.3712	117.5958	182.7317	-10.3547	198.377	410.2379	3593.0335
04539	71.0153	78.4509	125.7493	72.4172	117.5815	182.558	-10.5561	197.1459	409.9991	3592.1951

0.454	71.0316	78.4498	125.679	72.4527	117.5256	184.1539	-10.3134	199.859	409.1692	3593.0095
0.4541	71.0585	78.4867	125.7937	72.3895	117.6117	184.7056	-10.3341	200.3521	407.9546	3593.2454
0.4542	71.0359	78.4796	125.8802	72.3779	117.6648	185.3429	-10.4696	200.7681	409.0252	3594.0755
0.4543	71.0378	78.4635	125.828	72.3538	117.6557	186.9119	-10.133	201.0732	408.7862	3592.5938
0.4543	71.0469	78.4702	125.8161	72.3659	117.6431	186.1093	-10.5264	200.9529	407.3807	3593.258
0.4544	71.0441	78.4801	125.7944	72.4024	117.6613	187.4024	-10.275	202.7267	408.0507	3592.9534
0.4546	71.0578	78.4908	125.8405	72.3617	117.7184	186.9252	-10.2765	202.3387	408.4101	3591.2444
0.4547	71.0609	78.4969	125.9178	72.3858	117.7701	189.4266	-10.3821	203.8206	407.8624	3590.2042
0.4548	71.0598	78.4928	125.8392	72.3995	117.741	188.801	-10.4449	202.3175	407.801	3591.7044
0.4548	71.0431	78.4918	125.8508	72.3937	117.7428	188.5534	-10.3277	204.1422	406.3341	3592.4324
0.4549	71.0586	78.4946	125.8483	72.4091	117.7478	188.3889	-10.0365	205.8643	408.3608	3591.8313
0.455	71.0685	78.4844	125.8516	72.3999	117.7869	189.4781	-10.1575	204.5763	406.7258	3591.5511
0.455	71.052	78.4702	125.8124	72.426	117.7769	189.7536	-10.2221	205.1991	406.3618	3595.446
0.4552	71.0528	78.4684	125.8662	72.4274	117.8008	190.467	-10.2748	204.8406	408.0064	3591.2622
0.4552	71.0438	78.485	125.8869	72.4409	117.8691	189.9263	-10.1287	205.3617	406.1846	3592.737
0.4553	71.0175	78.4944	125.8782	72.404	117.7678	189.7145	-10.3066	206.1858	406.8712	3593.4423
0.4554	71.0709	78.4916	125.87	72.3751	117.8221	189.8149	-9.9764	203.137	407.6852	3590.2443
0.4555	71.0331	78.4832	125.915	72.4307	117.8625	191.3591	-10.3663	204.2829	407.5309	3593.4831
0.4555	71.0302	78.4876	125.8709	72.427	117.878	190.4848	-10.1745	206.1812	406.5881	3590.7461
0.4558	71.0366	78.494	125.844	72.4679	117.8511	190.5674	-10.1682	205.6686	405.9155	3590.9608
0.4559	71.0303	78.4944	125.8684	72.4782	117.8431	191.6226	-10.3121	205.3876	407.2699	3593.3621
0.4559	71.0209	78.4906	125.874	72.4619	117.8811	191.1352	-10.3002	207.2416	406.3974	3592.9771
0.456	71.0221	78.4964	125.8677	72.4443	117.8949	192.8423	-10.1829	205.7682	405.0384	3592.6488
0.4561	71.0403	78.4788	125.853	72.4624	117.9226	190.9593	-10.2496	207.2354	406.6553	3591.9114
0.4561	71.0206	78.5051	125.792	72.5173	117.8989	193.1535	-10.2461	207.5015	405.6973	3592.6809
0.4562	71.0191	78.501	125.9625	72.4775	118.0098	193.2557	-10.3939	206.8991	404.6674	3591.8553
0.4563	71.0158	78.5049	125.9051	72.4131	117.9792	193.3068	-10.3107	208.1925	406.4345	3591.7811
0.4564	71.0244	78.5267	125.9766	72.4027	118.0241	194.2998	-10.37	209.1645	406.2621	3592.8732
0.4565	71.04	78.504	125.9624	72.4392	118.0798	193.2984	-10.105	209.571	405.5091	3593.0095
0.4566	71.0446	78.502	125.9269	72.4746	118.0514	195.2554	-10.3714	209.8433	405.7566	3593.0921
0.4567	71.0673	78.5185	125.9183	72.5037	118.0131	194.9259	-10.1781	209.1645	405.1381	3591.3183
0.4568	71.0419	78.5212	126.0082	72.4529	118.0803	194.4033	-10.4368	209.6418	404.5066	3593.4831
0.4569	71.0551	78.5038	125.9934	72.43	118.1158	195.7267	-10.4694	209.4638	401.9099	3593.2179
0.457	71.0459	78.515	125.9853	72.4805	118.0828	195.6236	-10.1331	210.2066	404.4349	3593.5465
0.457	71.0749	78.5273	125.9338	72.4768	118.1157	196.5643	-10.3301	211.229	404.3583	3593.0231
0.4572	71.0602	78.4656	125.9529	72.4524	118.0978	195.9896	-10.2502	211.0123	404.6287	3592.9133
0.4573	71.0422	78.4874	125.9909	72.4962	118.149	195.6215	-10.0856	209.9706	403.9611	3593.8127
0.4573	71.0433	78.5124	125.9749	72.5183	118.1748	197.1795	-10.2285	211.1047	405.1658	3592.3122
0.4574	71.0576	78.5052	126.0335	72.4958	118.1822	196.6771	-10.1752	211.5472	403.8128	3590.4778
0.4575	71.058	78.5227	126.0051	72.501	118.2374	196.0232	-10.4115	210.6811	406.8794	3594.1347
0.4576	71.0656	78.5059	125.9963	72.4993	118.1808	197.7318	-10.4278	212.0315	404.2947	3592.3408
0.4577	71.0426	78.4964	125.9898	72.5055	118.2373	197.4053	-10.1743	211.3042	402.2033	3591.8633
0.4578	71.0328	78.5223	126.0938	72.4716	118.2915	195.9886	-10.2518	210.5208	403.3828	3593.5385
0.4579	71.04	78.5095	126.0516	72.4607	118.2625	197.0334	-10.3274	211.6214	403.9664	3593.7821
0.458	71.029	78.5313	125.9768	72.5356	118.2867	198.4875	-10.2899	212.8268	403.9033	3592.2801
0.4581	71.0287	78.4935	126.0289	72.4985	118.2995	198.0117	-10.2991	211.6992	403.3731	3595.6297
0.4582	71.0308	78.5076	126.0415	72.4639	118.329	198.4262	-10.27	213.3331	404.1414	3593.0576
0.4582	71.0301	78.517	126.203	72.4251	118.3735	196.5906	-10.2991	213.3516	404.7283	3595.9911
0.4584	71.0293	78.5214	126.2338	72.4287	118.412	197.526	-10.5519	213.5659	403.7372	3591.8553
0.4586	71.041	78.5229	126.1875	72.4552	118.4305	199.5651	-10.3373	213.4625	403.5434	3591.7511
0.4588	71.0515	78.5137	126.2399	72.4411	118.5015	198.1539	-10.4104	213.8625	403.3626	3593.4677
0.4589	71.0362	78.5155	126.1922	72.46	118.4802	199.526	-10.4619	214.3605	403.0893	3593.6908
0.4591	71.0451	78.5122	126.2327	72.4459	118.5301	200.378	-10.4243	214.3892	402.5946	3592.4328

04592	71.0385	78.528	126.2256	72.4381	118.5462	198.3481	-10.4439	214.4603	402.0151	3593.4022
04593	71.0112	78.544	126.2052	72.4657	118.5282	198.7662	-10.5227	212.7233	402.8844	3592.1759
04594	71.039	78.5463	126.2541	72.4698	118.5772	200.3565	-10.4527	215.8387	403.1779	3594.0835
04595	71.0684	78.5272	126.2309	72.4665	118.5615	199.0114	-10.1511	215.0109	402.4802	3591.8714
04595	71.0398	78.5191	126.2601	72.4606	118.5532	199.3012	-10.2325	214.7818	404.1801	3589.7233
04596	71.0563	78.5186	126.3301	72.4017	118.6422	198.7777	-10.6032	214.6226	401.53	3590.7308
04597	71.0278	78.5266	126.3587	72.4699	118.6684	200.5814	-10.4369	215.5063	402.6052	3592.1951
04598	71.063	78.5473	126.3513	72.434	118.6922	198.781	-10.7375	214.2311	403.0505	3594.0675
04598	71.0735	78.545	126.3509	72.4515	118.7143	201.3654	-10.4468	215.6355	403.0173	3592.224
04599	71.0422	78.5239	126.3336	72.4394	118.7413	200.7227	-10.4417	215.6866	402.6369	3591.9114
046	71.0588	78.5526	126.3615	72.4411	118.755	199.6822	-10.3768	214.9584	402.9706	3593.8511
04601	71.0136	78.5271	126.2826	72.4971	118.7189	201.8094	-10.5777	215.9729	401.9007	3593.2071
04603	71.0395	78.5212	126.2958	72.4959	118.7488	201.3625	-10.4726	215.2694	402.4198	3592.9771
04603	71.0285	78.5614	126.279	72.4958	118.7535	200.8738	-10.3359	215.6229	402.9441	3595.8367
04605	71.0117	78.5598	126.3721	72.4529	118.8231	200.115	-10.2316	215.7648	403.0727	3592.1599
04606	71.0236	78.5565	126.41	72.4444	118.8776	200.5628	-10.5955	215.5381	401.9643	3595.3997
04607	71.0142	78.5445	126.354	72.4649	118.8399	201.147	-10.5111	216.6739	402.519	3591.4225
04607	71.0232	78.5382	126.3939	72.4624	118.8748	200.2673	-10.5058	215.0885	401.5887	3591.6149
04608	71.0087	78.5587	126.3682	72.4529	118.8716	201.1981	-10.4129	216.2521	402.674	3593.1917
04609	71.0209	78.5715	126.3538	72.4851	118.8496	199.5205	-10.4619	214.3568	403.3219	3591.5668
04609	71.0353	78.5609	126.4027	72.4369	118.9014	200.8942	-10.5967	215.7608	401.8901	3593.1381
04611	71.0456	78.5656	126.3966	72.4984	118.9026	201.1359	-10.8198	215.4322	401.7604	3594.0595
04611	71.0426	78.5575	126.3921	72.458	118.9206	201.5261	-10.3134	215.5911	401.2177	3594.2117
04612	71.0415	78.567	126.4196	72.4762	118.9231	200.4499	-10.6278	217.8817	402.8223	3595.415
04613	71.0502	78.5651	126.4634	72.4876	119.0095	201.4638	-10.5087	215.58	401.8213	3592.0557
04614	71.0585	78.5621	126.3906	72.4905	118.9801	200.689	-10.3125	217.4646	400.1635	3593.3987
04615	71.0658	78.545	126.433	72.4846	118.9965	201.0895	-10.5731	215.9881	400.9851	3591.9275
04616	71.063	78.56	126.4382	72.4848	119.0243	202.2813	-10.2669	215.92	402.6629	3590.1161
04616	71.0832	78.56	126.4536	72.4963	119.0624	201.5731	-10.6259	217.1465	401.4664	3593.1151
04617	71.0541	78.5461	126.4574	72.4968	119.021	202.1577	-10.3965	216.3155	402.303	3594.6526
04618	71.0755	78.5623	126.4789	72.4958	119.05	200.834	-10.2301	216.2563	400.5975	3591.7672
04619	71.0645	78.5743	126.3904	72.52	119.0762	201.2427	-10.3977	216.9954	400.2708	3593.9633
0462	71.0681	78.56	126.5077	72.4846	119.114	202.2107	-10.4475	216.297	401.6607	3592.0717
04621	71.0871	78.5687	126.5169	72.4953	119.1402	201.8867	-10.2294	217.2384	402.2821	3592.1184
04622	71.0855	78.5392	126.4974	72.5326	119.1585	202.1642	-10.3123	216.6998	400.7304	3592.3362
04623	71.0776	78.5787	126.4926	72.529	119.1469	200.8516	-10.2359	216.0365	402.4092	3591.9881
04623	71.0301	78.5781	126.51	72.5404	119.1387	201.9376	-10.4937	215.9126	399.5455	3592.3362
04624	71.0842	78.5583	126.515	72.4945	119.1562	202.7235	-10.3575	216.1639	399.7005	3592.7771
04625	71.0727	78.5519	126.5077	72.5249	119.2122	202.8837	-10.5308	216.8425	401.3658	3594.1041
04625	71.0648	78.5567	126.5344	72.5119	119.2106	202.4206	-10.2542	216.6776	401.5389	3591.7111
04626	71.0265	78.5692	126.4855	72.5242	119.2306	201.3314	-10.2828	216.3688	400.476	3592.8621
04627	71.0433	78.5684	126.5217	72.4861	119.1854	202.2051	-10.2491	217.912	400.0383	3592.8091
04627	71.0582	78.5908	126.5611	72.506	119.2699	202.2711	-10.6221	217.0952	401.2066	3591.5908
04628	71.038	78.5606	126.5397	72.5096	119.2859	203.959	-10.6936	216.8402	401.0793	3591.9275
0463	71.0414	78.584	126.6259	72.4775	119.3116	201.7472	-10.1643	216.1744	400.762	3592.4788
0463	71.0102	78.5761	126.587	72.5096	119.3134	202.6018	-10.7055	216.7959	400.6197	3591.8553
04631	71.0258	78.5587	126.6493	72.4966	119.4044	201.5908	-10.3317	216.6056	402.2609	3593.6747
04632	71.025	78.5781	126.5873	72.5124	119.3861	202.821	-10.6067	217.8787	400.0438	3592.1359
04633	71.0627	78.5809	126.6107	72.5107	119.3919	202.9503	-10.5563	217.0758	400.7355	3590.6695
04634	71.0336	78.5884	126.5842	72.5398	119.3965	202.1871	-10.5614	215.6053	401.5406	3593.1764
04635	71.0765	78.6066	126.5725	72.528	119.3963	201.3105	-10.3645	219.1019	398.737	3590.4767
04636	71.0832	78.6005	126.6314	72.4887	119.3978	202.3602	-10.5572	217.195	400.1213	3591.6069
04637	71.0724	78.5924	126.6344	72.5173	119.4758	203.2725	-10.5315	217.8491	400.8301	3592.6328

04638	71.0683	78.584	126.5301	72.5698	119.4019	202.1258	-10.4092	217.0935	400.5819	3593.4524
04639	71.0625	78.6002	126.6391	72.5093	119.4755	202.6371	-10.5117	217.9415	400.8966	3594.2438
04639	71.0769	78.5925	126.6474	72.4971	119.5291	201.3172	-10.3462	219.4689	400.3435	3592.4941
0464	71.0913	78.6036	126.6105	72.5387	119.4868	201.671	-10.6249	217.2726	398.9751	3594.2598
04641	71.071	78.594	126.6054	72.5444	119.4679	203.3413	-10.4366	217.2207	400.9791	3592.5554
04641	71.0581	78.5738	126.6347	72.5329	119.5044	202.714	-10.7678	216.8354	401.4505	3592.5554
04642	71.0712	78.5962	126.5927	72.541	119.524	202.9483	-10.4334	217.9711	400.8412	3592.7851
04643	71.0637	78.5819	126.6521	72.5166	119.5172	202.5994	-10.5473	216.9768	400.5819	3594.0427
04643	71.0689	78.5939	126.6465	72.5323	119.5379	202.7727	-10.4843	218.5217	399.7227	3591.5347
04644	71.0651	78.6052	126.6216	72.5342	119.5654	201.9169	-10.5872	217.3727	400.2694	3591.7658
04647	71.0518	78.5972	126.6859	72.5343	119.6199	203.0644	-10.8344	217.2874	401.7659	3591.2462
04647	71.0268	78.6011	126.7067	72.5481	119.6411	203.6043	-10.4855	218.0514	401.6624	3591.5894
04648	71.0224	78.6239	126.7019	72.5124	119.6633	202.8275	-10.5385	217.8787	401.1236	3592.1759
04649	71.0362	78.5868	126.7328	72.5236	119.6919	204.4652	-10.7274	217.3317	400.1213	3592.1759
0465	71.0317	78.5792	126.701	72.5667	119.6976	203.5332	-10.7869	218.5569	400.4336	3594.6944
0465	71.0347	78.5878	126.6966	72.5478	119.6731	203.9943	-10.6804	218.178	400.4813	3589.6432
04651	71.0505	78.615	126.7429	72.4997	119.7086	202.6384	-10.9636	219.1296	399.9993	3593.9584
04653	71.0265	78.5949	126.7278	72.5159	119.7393	203.697	-10.7184	218.3924	399.9884	3594.7327
04654	71.0454	78.6316	126.7293	72.5149	119.6983	203.786	-10.8812	219.6858	401.3174	3591.7511
04655	71.0385	78.6128	126.7258	72.5334	119.732	204.7585	-10.7161	217.6803	400.8255	3593.0997
04655	71.0436	78.6221	126.7587	72.494	119.7803	201.9422	-10.619	217.2911	399.6728	3591.7591
04657	71.0311	78.6071	126.7368	72.5073	119.7683	202.7801	-10.5565	217.8159	399.9109	3592.0557
04658	71.0483	78.6079	126.7117	72.5654	119.8087	202.6322	-10.4739	218.518	400.2588	3591.9114
04659	71.0427	78.6023	126.8755	72.5109	119.8963	202.1995	-10.6517	217.7828	400.0311	3592.2411
0466	71.0554	78.6211	126.8407	72.5116	119.8874	203.8586	-10.8823	218.5698	398.8145	3592.6809
04661	71.0495	78.6077	126.8337	72.5351	119.9254	204.8015	-10.6157	219.028	400.3318	3590.8935
04663	71.0764	78.6505	126.9403	72.4455	119.9948	202.6509	-10.8744	219.2604	401.1592	3593.9354
04664	71.1128	78.6199	126.9491	72.4797	120.0486	203.7304	-11.0426	218.3074	399.4624	3591.7912
04664	71.0864	78.6264	127.0118	72.4772	120.1047	202.3399	-10.67	218.0444	399.7503	3594.8094
04665	71.0648	78.6127	126.9578	72.481	120.1922	201.9497	-10.6829	218.6806	399.8389	3592.4003
04666	71.0659	78.6133	126.9062	72.4594	120.2401	203.0658	-11.0191	218.8998	399.279	3586.7442
04667	71.0735	78.6281	126.9937	72.4367	120.4018	204.093	-10.9066	219.2215	400.3912	3592.3101
04668	71.0554	78.6313	126.9733	72.4636	120.4599	205.214	-10.6151	218.6696	399.0859	3592.3042
04669	71.0666	78.6145	126.9983	72.4689	120.5874	203.6097	-10.4911	218.1854	399.6119	3593.5625
0467	71.0582	78.6112	127.0175	72.4426	120.6466	203.5465	-10.8856	219.2682	400.2487	3592.2641
04671	71.0578	78.6515	127.0118	72.4773	120.7569	202.7664	-10.8553	219.8047	399.0194	3592.1338
04673	71.0686	78.6496	126.9695	72.4802	120.9131	204.5015	-10.7914	219.6156	398.8588	3590.7332
04675	71.0559	78.6203	127.0023	72.4822	121.0387	205.0207	-10.7887	219.126	401.3658	3594.2037
04675	71.0666	78.6349	127.0355	72.4738	121.0542	203.6394	-10.701	218.4404	398.2165	3591.5988
04676	71.0354	78.6461	127.0876	72.4816	121.1743	203.8184	-10.7059	220.2007	400.5872	3594.0197
04677	71.0426	78.6211	127.0814	72.4825	121.23	203.6896	-10.5299	218.1337	398.9973	3591.7591
04677	71.0356	78.6245	127.0311	72.475	121.292	203.2116	-10.8268	218.7867	400.1847	3592.3944
04678	71.0536	78.6295	127.0547	72.4859	121.3181	204.8359	-10.8349	218.5809	398.737	3591.1741
0468	71.0322	78.6381	127.0697	72.5244	121.4071	204.7532	-10.6178	219.0059	399.851	3592.4711
0468	71.026	78.6453	127.0609	72.5049	121.484	202.9613	-10.4902	219.1795	398.3605	3590.9176
04681	71.0657	78.6374	127.0103	72.4977	121.4503	205.0402	-10.471	219.0059	399.5226	3593.3527
04682	71.0635	78.6522	127.0649	72.5269	121.5879	202.4959	-10.3617	219.4345	399.9663	3594.4842
04684	71.0329	78.6388	127.0602	72.5463	121.7342	203.5279	-10.3872	220.1653	399.5438	3593.7821
04685	71.0613	78.6598	127.0476	72.5432	121.7717	204.2618	-10.4153	219.879	398.6434	3594.0657
04686	71.0593	78.6578	127.135	72.4863	121.8235	203.8753	-9.9987	219.5149	399.7239	3591.0528
04686	71.0809	78.6415	127.2149	72.4407	121.9254	203.0858	-10.3413	220.0443	399.3074	3590.4527
04688	71.0617	78.6453	127.1045	72.519	121.9845	205.396	-10.1285	219.2239	399.5565	3593.5385
0469	71.0607	78.657	127.1753	72.5098	122.1553	203.7825	-10.3527	218.5846	396.7658	3594.3159

04691	71.0581	78.6639	127.1565	72.4839	122.1984	203.647	-10.069	219.7058	400.1952	3592.4711
04691	71.0652	78.6466	127.1383	72.5288	122.2375	204.8963	-10.4426	219.3275	399.6815	3594.449
04692	71.0863	78.6621	127.1272	72.5422	122.2893	203.6524	-9.6482	221.6186	399.6396	3592.4565
04693	71.0571	78.6713	127.1849	72.5426	122.4019	204.5358	-10.1873	219.2978	399.1745	3594.9411
04693	71.061	78.6595	127.1553	72.4826	122.4048	204.2156	-9.8847	219.8542	399.1571	3592.7471
04694	71.0686	78.667	127.2031	72.4926	122.4957	203.0196	-10.2946	220.0345	398.1826	3594.449
04695	71.0666	78.6705	127.1646	72.4836	122.5014	204.5117	-10.1894	219.8669	399.18	3593.5786
04695	71.1115	78.6593	127.1554	72.5072	122.5445	203.344	-10.1315	219.1241	397.6074	3590.4287
04696	71.0766	78.6483	127.1605	72.5173	122.6201	205.8737	-10.2246	219.4124	398.4209	3591.5818
04698	71.0471	78.6578	127.0756	72.567	122.621	205.2455	-10.01	220.1087	399.6338	3593.9814
04699	71.0794	78.6909	127.1825	72.535	122.7164	205.3524	-10.1776	218.9652	397.984	3592.4244
047	71.0696	78.6437	127.1926	72.5087	122.7907	203.8451	-10.0857	220.2607	398.8817	3591.9268
04701	71.0818	78.6705	127.17	72.5441	122.9065	204.6315	-9.9826	221.6676	399.1571	3590.1098
04701	71.0668	78.6886	127.1746	72.5473	122.923	205.122	-10.3163	219.5417	398.1612	3592.5526
04702	71.0383	78.6685	127.248	72.4995	122.975	205.5156	-10.3199	219.5326	399.9251	3592.8621
04703	71.0543	78.6634	127.2107	72.5409	123.0565	206.2776	-9.9854	220.0554	398.9696	3596.9529
04705	71.0329	78.6776	127.1987	72.5491	123.1044	204.2051	-9.9354	219.6711	400.747	3590.1161
04705	71.0482	78.698	127.2351	72.5481	123.1807	204.6389	-10.1943	220.4324	397.2752	3593.4583
04707	71.0352	78.7003	127.275	72.52	123.3379	204.9316	-10.2561	220.1071	398.5432	3594.0033
04707	71.0566	78.6819	127.2337	72.5312	123.3377	206.0914	-10.0752	219.5644	399.8404	3592.2411
04709	71.0472	78.6664	127.2181	72.5282	123.4506	205.3078	-9.9845	218.8469	396.8765	3592.0076
04709	71.0613	78.6646	127.2069	72.5624	123.4803	203.6869	-9.9181	220.434	399.8033	3590.3551
0471	71.0452	78.7077	127.2286	72.5542	123.4661	205.6413	-9.9238	219.2682	397.8843	3593.7148
04711	71.0534	78.6739	127.2403	72.5405	123.5495	204.6537	-10.0757	220.1441	397.6688	3590.9301
04713	71.0577	78.682	127.2341	72.5701	123.6537	205.5382	-10.0688	220.2771	398.6041	3593.4102
04716	71.0859	78.6819	127.2608	72.542	123.8063	204.2059	-9.9729	220.0345	399.8616	3593.4677
04718	71.0576	78.7169	127.2325	72.613	123.9138	206.294	-9.8493	219.7906	399.459	3592.7011
04718	71.0852	78.7069	127.2371	72.6012	123.9585	205.4081	-10.1114	221.2306	397.2697	3591.663
04719	71.0915	78.7143	127.3268	72.5485	124.0393	205.0722	-9.804	220.5612	399.3213	3589.4428
0472	71.1005	78.6687	127.403	72.5159	124.0971	203.4406	-9.5901	220.4952	398.4712	3593.0656
0472	71.0955	78.7171	127.2959	72.5644	124.0647	205.6431	-9.8898	219.9815	397.7902	3589.9397
04721	71.0639	78.7038	127.343	72.5407	124.158	204.0539	-9.6866	220.9677	398.3838	3593.3297
04722	71.0863	78.6774	127.3036	72.557	124.1871	204.0231	-9.7891	219.1537	398.8478	3593.2018
04723	71.0884	78.6989	127.3392	72.571	124.1733	204.9789	-9.6199	220.6496	397.5947	3592.3868
04723	71.0827	78.6789	127.3046	72.5708	124.3053	204.3937	-9.7279	218.9985	398.7592	3591.134
04724	71.0691	78.6943	127.3035	72.593	124.2759	205.3761	-9.9302	221.042	397.3034	3592.0724
04725	71.0742	78.7067	127.2678	72.5832	124.2831	204.0415	-9.852	219.6351	399.5067	3591.9191
04725	71.0758	78.7077	127.3083	72.5874	124.3838	206.312	-9.9525	220.3769	398.7592	3592.0236
04726	71.0742	78.7116	127.3402	72.5501	124.4939	206.1918	-9.9149	221.4025	398.8605	3592.3944
04727	71.0559	78.7079	127.4057	72.539	124.5785	204.9105	-9.7224	220.2749	398.6963	3591.7734
04728	71.0296	78.7099	127.3479	72.605	124.5856	205.1564	-10.0416	219.8263	398.0172	3594.4121
0473	71.0349	78.7229	127.3397	72.617	124.692	205.4499	-9.7358	219.8152	398.0615	3593.1137
04731	71.0617	78.7065	127.4017	72.5959	124.7462	206.1225	-9.9748	222.1519	399.0194	3594.656
04732	71.028	78.6957	127.3965	72.6037	124.7564	205.3663	-9.7625	220.4471	398.3993	3593.0816
04733	71.0654	78.6834	127.4653	72.5464	124.8409	204.5524	-9.9003	219.6563	398.6381	3593.2837
04734	71.0481	78.7221	127.4007	72.5973	124.8382	204.3525	-9.826	219.8118	398.7122	3594.9167
04735	71.0432	78.7415	127.4	72.6015	124.8662	205.9377	-10.1464	219.734	398.2038	3591.5128
04736	71.0549	78.7265	127.3726	72.5759	124.9055	206.4566	-9.8697	219.582	398.3415	3593.7591
04736	71.0704	78.7074	127.3836	72.6569	124.9279	205.6366	-10.0267	219.8928	400.8412	3592.3442
04737	71.05	78.7277	127.3446	72.6067	124.8739	205.7537	-9.8396	221.1899	398.5986	3591.6469
04738	71.039	78.7448	127.3716	72.6369	124.9084	206.0612	-10.0396	221.6334	397.4524	3591.6389
04739	71.0454	78.741	127.4197	72.5866	124.9366	205.9293	-9.951	220.6356	397.696	3594.6285
04742	71.0376	78.7116	127.45	72.5917	124.9997	205.9341	-9.9604	220.8688	399.3425	3592.7164

04742	71.0879	78.7082	127.3974	72.633	124.9994	206.6894	-10.0508	220.6567	396.493	3592.3714
04743	71.0735	78.7105	127.4311	72.5958	125.0129	204.9604	-9.8025	221.0236	397.8511	3593.1858
04745	71.0715	78.7288	127.4364	72.5782	125.0455	205.5828	-9.9585	221.0569	397.2807	3594.5884
04746	71.0942	78.7462	127.4507	72.5998	125.0409	205.4632	-9.9374	220.8334	397.404	3592.3944
04747	71.0705	78.7226	127.4517	72.591	125.0657	205.504	-9.6512	221.1197	398.0555	3592.1031
04748	71.0763	78.7362	127.5024	72.5642	125.139	205.5512	-10.1366	221.4671	398.2442	3593.4022
04749	71.0405	78.7218	127.4462	72.6	125.1174	206.9657	-10.0374	220.1193	397.5417	3593.1074
04751	71.0469	78.7501	127.5337	72.592	125.1716	205.2943	-9.9673	221.2788	398.887	3591.0988
04752	71.0432	78.7269	127.4486	72.6171	125.1317	206.7142	-9.9601	221.1904	395.7886	3594.1347
04752	71.0605	78.7369	127.5439	72.5708	125.1842	205.409	-9.9318	220.5612	398.3997	3594.2574
04753	71.0531	78.7715	127.5773	72.5797	125.2539	205.7574	-10.1636	220.3289	397.2364	3594.1316
04754	71.0091	78.7303	127.6157	72.5833	125.2599	205.0152	-9.9045	220.776	396.8654	3592.5126
04755	71.0265	78.7272	127.5729	72.5854	125.2519	205.7769	-10.0396	223.0599	398.0559	3593.8992
04755	71.0457	78.7412	127.5447	72.6152	125.2511	207.0115	-10.0122	221.153	398.8312	3592.3923
04756	71.0576	78.7705	127.557	72.611	125.2855	206.2504	-10.1569	221.1127	397.4993	3592.7624
04757	71.0786	78.7563	127.5487	72.6652	125.285	207.4778	-9.96	221.3082	397.2973	3593.5705
04757	71.0764	78.7698	127.5389	72.651	125.2889	204.7363	-9.8303	221.8833	399.4114	3595.0164
04759	71.0727	78.7428	127.6302	72.6236	125.3615	205.3059	-9.8472	221.4856	397.9341	3593.8751
0476	71.114	78.7586	127.6189	72.633	125.3451	204.8074	-9.8845	221.1586	397.3722	3593.1227
04761	71.0962	78.7578	127.5756	72.6374	125.3613	206.6245	-10.0026	222.3039	397.5735	3592.8237
04761	71.0957	78.7733	127.5602	72.6284	125.3663	206.2377	-9.8082	220.9313	395.4036	3592.0958
04762	71.0855	78.7504	127.5519	72.6456	125.373	205.9395	-10.0282	220.4878	398.283	3592.729
04763	71.0814	78.7718	127.6409	72.6193	125.4147	205.6673	-9.8856	220.861	397.397	3591.9435
04764	71.0984	78.7406	127.6299	72.6222	125.399	205.5254	-9.8441	221.3955	397.4358	3590.8075
04767	71.0163	78.7561	127.6671	72.6749	125.4195	206.2584	-10.087	220.7662	397.7218	3592.5401
04769	71.0742	78.7652	127.7476	72.6354	125.481	207.474	-9.7704	220.9571	398.3097	3593.6977
0477	71.0582	78.7664	127.736	72.6121	125.5397	204.6194	-9.8665	221.2417	397.84	3590.6451
04772	71.0559	78.7566	127.7917	72.6122	125.5275	205.1939	-9.9882	221.5899	397.6476	3593.5214
04772	71.0706	78.7615	127.7862	72.6432	125.5387	206.6174	-10.0791	220.7203	399.8351	3594.7404
04773	71.0704	78.7405	127.8008	72.653	125.5124	206.5312	-9.9244	221.371	397.7237	3589.8836
04775	71.0638	78.7822	127.7794	72.6744	125.5333	206.2209	-9.8499	221.8034	398.0559	3593.1297
04776	71.0881	78.762	127.8343	72.6583	125.6083	206.2327	-9.7875	220.7026	397.7589	3591.9958
04777	71.0872	78.761	127.7938	72.651	125.594	207.3229	-10.0033	220.4481	398.5321	3592.1798
04778	71.0982	78.7647	127.821	72.6349	125.6546	205.1175	-9.6453	220.7486	398.0555	3593.0384
04779	71.075	78.773	127.8307	72.6453	125.6644	207.593	-9.9958	221.1123	396.4889	3589.7794
0478	71.0845	78.7621	127.809	72.6971	125.6651	206.2674	-9.5717	220.4397	397.469	3594.5404
04781	71.0986	78.7846	127.8358	72.6452	125.667	206.2993	-9.8808	222.0459	397.8065	3593.0767
04782	71.0842	78.7517	127.8207	72.6708	125.6793	206.6232	-10.0379	221.5262	396.0736	3592.6168
04782	71.0728	78.7832	127.8253	72.6613	125.6827	205.9945	-9.3913	221.1268	397.1815	3591.0758
04783	71.0702	78.7708	127.8282	72.6912	125.7117	206.1485	-9.9431	221.1863	398.0172	3593.4423
04784	71.073	78.7863	127.8579	72.6706	125.704	204.834	-9.6564	222.4095	397.1478	3594.1797
04784	71.0643	78.7751	127.8153	72.7061	125.7262	205.1731	-10.1399	221.4376	396.9873	3590.8695
04785	71.0447	78.7722	127.8282	72.6765	125.7285	205.8577	-9.7453	219.8578	396.2811	3589.8415
04786	71.0652	78.7756	127.8408	72.6992	125.7626	206.2513	-10.0121	220.0946	398.0714	3592.3408
04786	71.0456	78.7829	127.9396	72.6515	125.7518	207.0244	-9.9817	221.4237	397.9442	3593.5061
04787	71.086	78.7789	127.9121	72.6369	125.7384	206.2488	-10.0258	221.3304	396.0515	3594.8209
04788	71.0872	78.7809	127.9081	72.6889	125.8017	207.3868	-10.0306	221.5817	396.7935	3594.3159
04789	71.0587	78.7822	127.8997	72.6802	125.7458	205.1833	-9.6272	220.7428	396.9983	3593.3862
0479	71.0597	78.7909	127.8718	72.7028	125.7304	205.0635	-9.6926	220.5173	399.7393	3593.5705
04791	71.0605	78.7929	127.9721	72.6726	125.8129	207.0714	-9.9154	222.4453	396.2017	3589.0058
04791	71.0796	78.7705	127.9544	72.6715	125.8	205.0313	-9.6959	221.1692	398.0819	3592.5248
04792	71.0732	78.7934	127.9437	72.6215	125.8441	205.0775	-9.7621	221.0915	397.5894	3592.2641
04794	71.0881	78.7839	127.9911	72.6944	125.8343	206.3224	-9.6588	220.9748	397.9495	3593.9967

0.4795	71.0416	78.7906	128.0516	72.6573	125.863	205.6896	-10.0019	220.7132	397.17	3593.3141
0.4795	71.0919	78.8026	128.009	72.6876	125.8801	205.4183	-9.6665	221.7517	398.1279	3592.6809
0.4796	71.0814	78.7972	128.0023	72.6782	125.9283	204.9957	-9.919	220.6208	396.212	3593.3702
0.4797	71.0993	78.782	128.022	72.6575	125.9106	207.2149	-9.9782	220.6208	397.7569	3592.4164
0.4798	71.0792	78.8043	127.9947	72.6908	125.8808	206.4681	-9.9954	220.3703	396.6572	3590.0715
0.4799	71.0759	78.7888	128.0373	72.6881	125.8829	205.1975	-9.8326	220.6248	397.3087	3591.5128
0.48	71.0579	78.7781	128.0999	72.6498	125.9503	207.306	-9.8602	221.6959	397.0756	3592.3561
0.48	71.0707	78.7967	128.1117	72.6576	125.9928	205.0272	-9.7974	220.5839	397.1368	3592.9053
0.4801	71.0495	78.796	128.0389	72.6826	125.9749	206.4346	-10.0872	220.6689	397.9784	3593.1618
0.4802	71.0312	78.7978	128.0659	72.6784	125.9925	206.788	-9.9734	220.897	397.9654	3590.5775
0.4803	71.0699	78.8011	128.1002	72.6586	125.9864	206.3835	-9.7672	222.7717	398.6761	3592.0878
0.4804	71.0656	78.7942	128.1133	72.6695	126.012	207.3645	-9.9242	220.5802	395.985	3592.6729
0.4805	71.0467	78.811	128.0957	72.6744	126.0118	206.1661	-9.8731	220.1552	397.1811	3592.761
0.4805	71.0457	78.7871	128.1388	72.6675	126.0249	205.6626	-9.9725	220.765	397.098	3593.298
0.4806	71.0776	78.7905	128.1107	72.695	126.0136	206.2593	-9.7113	220.5541	397.8171	3595.185
0.4807	71.0633	78.8173	128.159	72.6525	126.0676	205.3319	-10.0552	220.7465	397.4136	3591.1981
0.4807	71.0708	78.7934	128.1533	72.6972	126.0562	205.7422	-10.109	221.4343	397.0491	3590.1405
0.4809	71.0738	78.7896	128.1353	72.692	126.0613	206.7198	-9.9453	220.9313	398.1667	3593.6186
0.4809	71.0814	78.7896	128.1612	72.6624	126.0922	205.2641	-9.9177	220.9165	397.7957	3595.9269
0.4811	71.0754	78.8077	128.1681	72.6879	126.1353	207.1807	-9.9239	219.4972	397.0068	3593.1227
0.4812	71.087	78.8054	128.2063	72.6882	126.1697	204.7839	-9.7514	220.0443	398.2331	3593.7709
0.4813	71.0796	78.7853	128.2498	72.646	126.1809	205.2836	-10.0929	221.5447	397.325	3590.9576
0.4814	71.095	78.8285	128.1084	72.7282	126.1266	206.286	-9.99	220.5913	396.5332	3593.5705
0.4815	71.0911	78.8069	128.2057	72.6978	126.2066	205.8865	-10.0716	220.2365	397.3416	3593.7869
0.4816	71.0656	78.8247	128.2008	72.6876	126.1866	206.9901	-9.9712	220.6763	397.2309	3590.6531
0.4819	71.0632	78.8199	128.1486	72.7289	126.1968	205.5405	-10.1246	220.4941	398.3944	3593.8587
0.482	71.0909	78.7965	128.2187	72.7213	126.2594	205.7983	-9.7972	221.4302	396.9762	3590.3405
0.482	71.0728	78.8064	128.1973	72.753	126.238	206.1587	-10.1013	220.2217	396.727	3592.769
0.4822	71.042	78.8036	128.2375	72.7297	126.3001	206.2087	-10.1429	220.0345	396.9538	3592.4098
0.4823	71.0471	78.8087	128.2267	72.6966	126.294	205.2997	-9.8198	220.282	396.0322	3592.1568
0.4823	71.0541	78.8005	128.2573	72.7048	126.3529	205.7973	-9.8751	220.7576	396.3283	3592.6488
0.4824	71.0472	78.8115	128.2723	72.6971	126.3778	205.5567	-10.0221	221.1086	396.8765	3592.5366
0.4825	71.0488	78.8323	128.2372	72.7294	126.3403	205.8435	-10.0096	220.0062	396.975	3591.7581
0.4826	71.0487	78.8232	128.2795	72.7326	126.3625	205.0821	-9.9392	220.6947	398.4989	3593.8511
0.4827	71.0456	78.7902	128.2753	72.7001	126.388	205.7822	-9.7709	220.2784	397.0015	3593.0691
0.4828	71.0549	78.842	128.3903	72.6751	126.441	205.5103	-9.8091	220.2587	398.8478	3591.4065
0.4828	71.0602	78.8321	128.473	72.6119	126.5462	203.9627	-10.0232	219.7228	397.9397	3594.0595
0.483	71.0559	78.8418	128.3921	72.622	126.5643	203.8184	-9.8224	220.5895	396.8743	3592.9924
0.4831	71.0987	78.8504	128.4192	72.6645	126.663	204.6102	-10.2214	219.8083	396.7154	3592.7394
0.4832	71.0934	78.8245	128.4448	72.6468	126.7223	206.6529	-9.9817	220.0776	396.6052	3593.0977
0.4832	71.0722	78.8186	128.4356	72.6501	126.7953	204.4467	-9.8766	220.7686	396.9042	3593.6587
0.4834	71.0904	78.829	128.4192	72.6282	126.9433	205.3988	-9.7735	219.5269	397.0759	3591.6229
0.4834	71.0689	78.856	128.4344	72.6284	127.0257	203.3041	-9.9211	220.5137	397.0482	3590.1241
0.4837	71.0659	78.8224	128.458	72.6577	127.2784	204.4383	-9.9437	221.2934	396.8433	3592.8091
0.4838	71.0817	78.8382	128.4139	72.7044	127.2967	205.0542	-10.1611	220.5358	397.7126	3595.6544
0.4839	71.0802	78.8189	128.4379	72.6575	127.3605	204.3826	-10.0388	219.708	397.0592	3591.5988
0.4839	71.1028	78.8253	128.5197	72.6234	127.4758	204.8438	-10.4948	220.1618	396.975	3592.6704
0.484	71.098	78.8316	128.4675	72.6624	127.4773	206.1829	-10.2654	221.3526	396.4003	3591.8313
0.4841	71.0878	78.829	128.4944	72.6797	127.5365	203.7862	-10.225	219.5824	396.7381	3592.7129
0.4841	71.073	78.8637	128.4893	72.6679	127.5597	205.5538	-10.2585	221.5863	397.1074	3592.8544
0.4842	71.0866	78.8583	128.5596	72.6496	127.6814	203.9571	-10.4543	220.3252	396.871	3593.1297
0.4843	71.0754	78.8516	128.538	72.6495	127.7419	203.6763	-10.4591	221.2753	396.5936	3591.3211
0.4844	71.0591	78.8547	128.4449	72.6835	127.7893	204.5231	-10.5962	219.978	396.493	3594.4184

04845	71.0757	78.8396	128.5473	72.6591	127.8917	206.1234	-10.4918	220.8016	396.9114	3595.5914
04847	71.0526	78.8423	128.5659	72.6509	128.0363	203.6115	-10.528	220.1404	396.0127	3593.0816
04848	71.0828	78.8491	128.5285	72.6788	128.0158	205.0287	-10.4777	218.7761	396.9008	3594.3801
04849	71.0894	78.8703	128.5623	72.6744	128.2901	204.069	-10.4308	222.113	396.9909	3590.9991
0485	71.0526	78.8626	128.6276	72.6555	128.3346	203.8949	-10.8125	220.0517	397.3416	3594.0675
04851	71.0485	78.8687	128.5218	72.6721	128.4204	204.2646	-10.8638	220.1293	397.1977	3592.6007
04852	71.0608	78.8589	128.564	72.6444	128.4752	203.7563	-10.4848	218.9139	396.3182	3594.518
04852	71.0789	78.8769	128.5495	72.671	128.5607	204.3285	-10.737	221.148	396.7525	3591.0374
04853	71.0816	78.8674	128.6138	72.6563	128.6987	204.8998	-10.6217	220.5789	396.689	3591.6968
04855	71.0796	78.8654	128.6062	72.6827	128.8626	204.8572	-10.8367	219.9143	395.3966	3592.0188
04856	71.0679	78.8489	128.605	72.6816	128.9043	205.6969	-10.4904	220.3138	396.8849	3592.0034
04859	71.0871	78.8843	128.6182	72.6687	129.2436	204.7699	-10.6179	219.8706	397.1534	3592.4003
04859	71.0891	78.8532	128.6154	72.6583	129.2856	206.0324	-10.5482	220.8204	394.2463	3592.1679
0486	71.0972	78.8708	128.6181	72.6535	129.3387	204.7577	-10.5997	219.7376	398.0978	3592.9387
04861	71.1194	78.8759	128.6845	72.6629	129.4765	205.3361	-10.4457	219.8083	396.4294	3590.2708
04861	71.0911	78.872	128.6859	72.6449	129.5375	203.9464	-10.419	220.0663	396.0004	3599.394
04862	71.1256	78.8743	128.6614	72.6875	129.568	204.7346	-10.4358	220.2291	394.9938	3592.8812
04863	71.0909	78.8626	128.6724	72.7116	129.6263	204.7699	-10.4214	221.0273	397.0482	3590.1481
04865	71.0847	78.8633	128.6845	72.6874	129.8169	204.0628	-10.2176	219.7376	395.2059	3591.6814
04866	71.1032	78.8799	128.6667	72.6751	129.9042	205.0765	-10.8581	220.5802	397.2032	3592.3843
04866	71.0975	78.8881	128.7722	72.6698	130.0163	203.4497	-10.6523	220.4375	395.2695	3590.6848
04867	71.0705	78.8575	128.6451	72.7065	129.9846	205.069	-10.9595	220.2217	397.6905	3591.6309
04868	71.0628	78.8804	128.6455	72.6764	130.0995	204.9167	-10.0458	220.3252	395.7137	3592.6729
04868	71.074	78.8769	128.7483	72.6991	130.1424	204.2352	-10.6486	219.377	395.958	3592.4788
04869	71.0911	78.9012	128.7133	72.6534	130.1527	205.2535	-10.241	219.5644	398.0661	3594.748
0487	71.0576	78.902	128.7555	72.6161	130.309	203.0498	-10.7112	220.4446	396.0322	3595.668
0487	71.0702	78.8726	128.7469	72.6628	130.3252	204.2757	-10.4284	218.4256	395.5254	3594.0194
04871	71.0922	78.897	128.7237	72.6365	130.4214	203.4202	-10.5782	219.8928	396.0182	3591.0378
04872	71.0728	78.8781	128.7765	72.6425	130.6964	203.7758	-10.4652	219.5113	396.2176	3592.9311
04873	71.0747	78.8825	128.7575	72.6523	130.8344	203.9562	-10.1654	219.2886	396.922	3591.7121
04874	71.062	78.8917	128.7783	72.6688	131.0432	202.6793	-10.28	219.5714	396.6572	3591.7581
04876	71.0422	78.872	128.741	72.6695	131.2414	203.6034	-10.3772	219.6775	396.5301	3590.4241
04877	71.0483	78.8976	128.8224	72.6309	131.4487	202.9397	-10.818	219.3806	396.9379	3592.3714
04877	71.0554	78.9011	128.8035	72.6749	131.5407	204.6529	-10.4396	219.7043	397.2032	3591.0298
04878	71.0637	78.8837	128.7638	72.6441	131.728	204.5355	-10.8096	220.2395	396.8214	3595.852
0488	71.07	78.9003	128.7467	72.7035	131.9215	204.9381	-10.6934	219.7228	396.5664	3590.4206
04881	71.099	78.8784	128.8163	72.6907	132.1502	205.0774	-10.4189	218.7582	396.6938	3593.7549
04882	71.0933	78.8961	128.8426	72.6517	132.3251	203.3004	-10.4547	219.5078	396.7896	3593.9124
04883	71.0769	78.9066	128.8127	72.6601	132.5068	203.7367	-10.8792	218.4791	396.1169	3592.5938
04884	71.0909	78.8983	128.8669	72.671	132.7003	202.9483	-10.2309	219.4382	396.3394	3592.6488
04884	71.0825	78.8878	128.7345	72.724	132.7259	203.9855	-10.8632	219.9603	395.7727	3591.7581
04885	71.0857	78.891	128.767	72.7133	132.7892	203.5341	-10.1782	219.0447	396.922	3590.9071
04886	71.0919	78.8916	128.7997	72.7016	132.9637	204.011	-11.1442	220.7243	396.6218	3591.7271
04886	71.0901	78.8978	128.7345	72.7044	133.0397	204.9522	-10.2612	219.4583	395.672	3592.4941
04887	71.119	78.8983	128.8012	72.6802	133.1815	203.6756	-11.0457	220.4952	396.4003	3590.1962
04888	71.0776	78.8799	128.783	72.728	133.2552	204.0286	-10.0694	218.6474	397.2032	3592.753
04889	71.083	78.8675	128.7907	72.7087	133.3872	203.8456	-10.8182	219.0132	395.7967	3592.8332
04889	71.1116	78.8934	128.8535	72.6955	133.502	204.4439	-10.6607	219.3311	397.325	3593.7228
0489	71.0999	78.8929	128.8024	72.6495	133.5591	203.8895	-10.7187	219.0801	395.8468	3593.0537
04891	71.0692	78.9199	128.8654	72.6363	133.735	203.0449	-10.245	219.2904	396.5996	3592.4565
04891	71.1079	78.9083	128.8644	72.6862	133.7421	204.8341	-10.4674	218.1504	396.2176	3591.6508
04892	71.1095	78.9066	128.8363	72.6907	133.8798	202.6213	-10.5409	220.2032	396.3615	3588.9539
04893	71.084	78.9185	128.849	72.7047	134.0024	204.2823	-10.7264	219.5785	396.2864	3592.0954

0.4893	71.1028	78.9324	128.8066	72.7247	134.01	204.2165	-10.7034	219.9426	397.351	3589.3968
0.4894	71.0758	78.9189	128.9139	72.6708	134.2505	204.4011	-10.7281	220.1219	396.6052	3590.2844
0.4895	71.085	78.9306	128.8895	72.684	134.3404	203.1591	-10.68	221.3599	396.4834	3590.8374
0.4896	71.106	78.8878	128.8775	72.6973	134.475	204.1968	-11.1539	219.3865	396.9263	3593.4904
0.4897	71.0751	78.8952	128.8699	72.7328	134.5393	205.2595	-10.5938	218.8211	395.6417	3594.2598
0.4898	71.082	78.897	128.8437	72.7341	134.6126	203.8893	-10.8935	218.6622	397.8345	3592.2481
0.4898	71.0857	78.9105	128.885	72.6975	134.7368	203.902	-10.7472	219.7871	396.7631	3592.4098
0.4899	71.0661	78.9016	128.8549	72.6996	134.8373	202.5052	-10.6445	218.7213	397.3583	3590.597
0.49	71.0774	78.9128	128.9184	72.7238	134.9975	204.3974	-10.5677	219.3163	396.273	3590.7733
0.4901	71.0725	78.9334	128.9275	72.6821	135.1034	202.7838	-10.5144	219.6267	395.4922	3590.5088
0.4902	71.0816	78.9039	128.8914	72.7139	135.2301	203.1289	-10.5238	218.5923	396.9379	3592.1108
0.4903	71.0679	78.956	128.9005	72.7306	135.3295	203.6994	-10.927	218.3625	395.582	3593.4601
0.4904	71.0968	78.9143	128.9555	72.6955	135.4442	202.599	-10.6126	219.623	396.4557	3594.2678
0.4905	71.0814	78.9402	128.9567	72.6856	135.604	202.4563	-10.5666	219.2604	396.7313	3592.2948
0.4907	71.1037	78.9237	128.9726	72.7029	135.8536	202.5107	-10.7686	220.4324	397.0149	3594.8449
0.4908	71.1341	78.9295	128.9463	72.7409	135.9331	203.4852	-10.9054	220.2183	396.2335	3592.0724
0.4909	71.1082	78.9334	128.9187	72.7292	136.0306	203.9943	-10.6249	219.2498	396.7768	3589.9958
0.4911	71.0955	78.9519	128.9412	72.7161	136.3816	202.4083	-10.5456	218.9139	397.0597	3593.1074
0.4914	71.0942	78.9245	128.915	72.7637	136.6102	204.0212	-10.8963	219.7302	395.3815	3593.0255
0.4914	71.0891	78.9309	128.9122	72.7523	136.6707	203.1156	-10.5686	218.9175	396.6148	3590.8458
0.4915	71.083	78.9492	129.0024	72.6959	136.8176	203.1885	-10.975	219.2816	396.1434	3592.5094
0.4916	71.0746	78.9532	128.9376	72.7384	136.8809	204.3194	-10.392	218.8469	395.8355	3592.2561
0.4916	71.0628	78.9484	128.9186	72.7345	136.9382	202.8935	-10.8157	218.4756	395.8097	3593.1151
0.4917	71.0822	78.9481	129.022	72.779	137.0543	203.605	-10.5264	216.8328	396.1401	3593.803
0.4918	71.083	78.9362	128.9468	72.7275	137.1159	203.5558	-10.9224	219.0982	395.1046	3592.4404
0.4918	71.0906	78.9446	128.956	72.7191	137.2176	202.756	-10.3202	218.7915	396.057	3591.3664
0.4919	71.0975	78.9481	128.9648	72.7509	137.3273	202.8721	-11.2107	219.6969	397.3804	3591.2542
0.492	71.0633	78.9548	128.9235	72.7443	137.373	203.344	-10.4431	219.0095	395.8189	3592.4324
0.4921	71.0736	78.9497	128.9687	72.7448	137.49	202.939	-10.7721	219.3274	396.3615	3590.7573
0.4924	71.119	78.9631	129.0029	72.7208	137.8623	201.8663	-10.8374	218.214	395.7886	3590.6541
0.4926	71.0935	78.9548	129.0198	72.7235	138.05	203.5759	-10.9012	219.6775	396.9591	3592.3331
0.4928	71.1062	78.9695	129.0591	72.7149	138.22	201.6719	-11.0054	218.7952	397.6462	3593.6427
0.4928	71.0927	78.9484	129.0695	72.7383	138.2552	202.2339	-11.3825	218.4774	397.4911	3593.4503
0.493	71.0858	78.9466	129.0606	72.7293	138.3332	204.0723	-11.019	218.7065	396.5055	3592.5045
0.493	71.0725	78.9893	129.081	72.7144	138.4477	203.4369	-10.9024	219.1722	396.1899	3591.5427
0.4931	71.086	78.9399	129.0027	72.7669	138.4362	203.0419	-11.1632	218.9458	396.1328	3592.0954
0.4932	71.0701	78.9606	129.0201	72.7286	138.5366	203.7349	-10.8115	218.617	395.1318	3590.7538
0.4932	71.0679	78.9492	129.0853	72.7698	138.6181	202.5971	-10.8515	218.6806	396.284	3591.2061
0.4933	71.0713	78.957	129.0096	72.7716	138.64	203.8504	-11.0683	219.78	394.2685	3590.9071
0.4934	71.0585	78.9576	129.0556	72.7471	138.7424	203.3551	-10.6034	218.3333	395.4368	3591.7111
0.4934	71.0876	78.9484	128.9926	72.7769	138.8135	202.795	-11.1813	218.9541	395.7414	3591.7912
0.4935	71.1029	78.9811	128.9746	72.7747	138.802	203.1565	-10.4173	219.3063	396.7419	3592.3638
0.4936	71.0702	78.9438	129.0802	72.7212	138.9702	201.5288	-11.0402	218.3628	395.3925	3590.0039
0.4936	71.0772	78.9725	129.0238	72.7545	139.0124	202.2422	-11.0073	219.8224	396.493	3592.4481
0.4937	71.1144	78.9675	129.0466	72.7379	139.0657	201.7388	-10.5534	219.5011	396.0238	3591.5588
0.4938	71.1522	78.9746	129.0675	72.744	139.1559	201.6347	-10.9643	218.8395	396.3615	3590.0039
0.4939	71.1106	78.9306	129.0698	72.7539	139.2201	203.435	-11.1657	218.1854	396.0127	3593.29
0.4939	71.1084	78.9672	129.1236	72.7225	139.3109	202.7788	-10.9063	218.8645	394.9994	3593.3527
0.494	71.0916	78.9796	129.0468	72.778	139.3625	203.9855	-11.0402	218.4721	395.7886	3592.3101
0.4941	71.0922	78.9861	129.0718	72.7483	139.4006	204.0983	-10.7765	217.4537	396.871	3593.3541
0.4941	71.1077	78.9762	129.0849	72.7438	139.4692	202.0431	-10.9864	219.0518	395.2059	3592.9081
0.4942	71.0878	78.9665	129.081	72.7655	139.5635	203.0031	-11.0501	217.827	396.1788	3594.2198
0.4943	71.0907	78.9896	129.0713	72.7631	139.6455	203.3654	-10.7599	218.0302	395.7857	3591.0378

0.4943	71.0765	78.9524	129.0617	72.781	139.7022	203.543	-11.123	217.7969	395.8468	3595.4534
0.4944	71.0797	78.9761	129.0466	72.7864	139.7004	203.9933	-10.8147	218.4441	395.0603	3593.274
0.4945	71.062	78.9867	129.0712	72.7371	139.8349	202.1098	-10.8398	218.0656	398.1985	3593.2607
0.4945	71.0843	78.9833	129.021	72.7831	139.831	203.4889	-10.9637	219.9334	395.9573	3593.6908
0.4946	71.0838	78.9904	129.1128	72.7547	139.9571	201.1693	-10.8198	217.912	396.871	3591.6069
0.4947	71.0623	78.9919	129.1069	72.7562	140.0429	202.4912	-10.9373	218.3333	395.3205	3594.1075
0.4948	71.1119	78.9828	129.1894	72.7606	140.166	202.4447	-10.9917	218.3484	396.154	3594.2421
0.4951	71.1138	78.9628	129.1437	72.7528	140.4855	202.4963	-11.1418	217.4363	397.69	3593.6747
0.4952	71.1057	78.9665	129.1861	72.7455	140.5083	201.9905	-10.8922	218.7028	397.5078	3593.0816
0.4953	71.1124	78.9906	129.087	72.7459	140.55	202.8215	-11.1031	218.3731	395.7727	3591.5434
0.4953	71.0935	78.9797	129.1191	72.7764	140.6473	204.2702	-11.1041	217.4907	394.2352	3596.1113
0.4954	71.0975	78.9733	129.0825	72.778	140.6664	201.3429	-10.8899	218.4933	395.9263	3591.9881
0.4956	71.1023	78.9611	129.1689	72.7665	140.9255	202.2324	-11.1993	218.5357	395.9422	3593.5291
0.4957	71.1333	78.9939	129.1282	72.7705	140.9736	203.4397	-11.047	218.5661	396.0459	3591.7431
0.4958	71.1099	78.9881	129.1103	72.7801	141.071	202.3212	-11.0379	218.1433	394.4433	3591.8118
0.4959	71.1185	78.9995	129.1515	72.7509	141.1082	201.7927	-10.8557	218.9467	394.7004	3594.7568
0.496	71.0791	78.9891	129.164	72.7761	141.2406	201.2559	-10.9151	218.1504	396.6413	3592.2488
0.4961	71.108	78.9886	129.1641	72.7542	141.3236	201.7543	-10.9919	218.2989	395.4549	3593.4064
0.4962	71.0646	78.9942	129.1843	72.7693	141.4035	202.2618	-11.287	217.7161	395.7469	3594.7247
0.4963	71.0894	78.9883	129.1649	72.8029	141.4957	203.3338	-11.1925	218.5698	398.5432	3578.4623
0.4964	71.0641	78.9759	129.1412	72.8016	141.5588	201.8205	-10.9775	217.6828	394.5896	3575.7131
0.4965	71.0677	78.9971	129.0836	72.8474	141.6368	204.0379	-10.9135	218.1716	395.3013	3526.677
0.4966	71.0577	79.0026	129.0531	72.8798	141.6842	202.7485	-10.5161	217.6385	395.9352	3518.7906
0.4966	71.0774	79.002	128.9086	73.0025	141.6475	206.6094	-10.7852	218.9528	396.1805	3453.3084
0.4967	71.0952	78.9916	128.8088	73.0224	141.7385	206.2237	-10.8283	217.8085	394.5675	3318.2074
0.4968	71.1231	78.9696	128.7352	73.1006	141.7427	205.3121	-10.5602	217.8004	397.7589	3188.024
0.4969	71.1014	78.9901	128.644	73.1597	141.7701	206.9529	-11.139	217.3465	396.3837	3146.7667
0.497	71.0855	78.9979	128.5244	73.2166	141.8103	207.6028	-10.6923	217.4752	395.4178	3008.8884
0.497	71.0988	78.9647	128.5068	73.2896	141.7798	209.9079	-10.9691	217.9859	395.2375	2940.4449
0.4972	71.0852	78.9781	128.5294	73.2558	141.8294	209.61	-11.139	217.8287	395.9951	2871.7499
0.4972	71.0981	78.969	128.431	73.3804	141.7565	210.3343	-11.0977	217.5239	395.9629	2804.5348
0.4974	71.0868	78.968	128.3626	73.3639	141.6463	210.6752	-11.1826	218.5698	395.8577	2746.322
0.4974	71.0806	78.9614	128.3014	73.401	141.5411	210.4595	-11.1038	217.5636	395.3754	2672.2674
0.4975	71.1121	78.9499	128.2804	73.4123	141.4728	211.777	-11.66	217.742	395.8909	2614.2993
0.4976	71.0818	78.9626	128.22	73.4343	141.3534	211.7017	-11.3935	217.9737	396.2864	2532.1468
0.4977	71.0613	78.968	128.181	73.4687	141.2898	211.8587	-12.2424	217.3761	396.1179	2521.3736
0.4978	71.0662	78.9738	128.1628	73.4807	141.2444	211.5871	-11.6586	218.7655	395.4284	2476.1353
0.498	71.085	78.9891	128.1312	73.4866	141.1436	211.5336	-12.4585	217.2689	395.9573	2475.1753
0.4981	71.0758	78.9672	128.0467	73.5021	141.0546	211.3868	-11.5468	217.4722	395.1544	2476.9306
0.4982	71.0711	78.9567	128.1223	73.4513	141.005	210.0446	-12.5135	217.6944	396.2811	2473.0534
0.4982	71.0626	78.982	128.0557	73.496	140.9273	211.227	-11.6312	217.753	396.1234	2472.9391
0.4983	71.076	78.9713	127.9936	73.4977	140.8866	210.9473	-11.5433	217.4752	395.0735	2476.672
0.4984	71.0825	78.9891	128.0869	73.4565	140.8988	210.8917	-12.9341	217.6422	395.088	2475.2875
0.4984	71.0806	78.976	127.9946	73.4792	140.8022	211.4618	-11.2947	217.1253	395.1318	2473.1991
0.4985	71.0855	78.9711	127.9393	73.5226	140.7306	210.0721	-11.1218	219.1861	394.9888	2472.6164
0.4986	71.083	78.9642	127.9312	73.5011	140.7216	211.7147	-13.2488	217.8676	395.2209	2473.396
0.4986	71.1016	78.9896	127.865	73.5027	140.6069	212.5512	-11.0715	216.4607	395.0788	2473.3601
0.4987	71.1014	79.0003	127.8525	73.5046	140.5318	212.1764	-11.9208	217.9083	395.0381	2474.51
0.4988	71.0862	78.9913	127.9203	73.4592	140.5742	211.8305	-13.2071	216.4748	396.3023	2475.292
0.4989	71.1272	78.9828	127.8233	73.4901	140.4979	212.4709	-10.6004	218.0154	395.8577	2472.7708
0.499	71.1192	78.9925	127.8418	73.4765	140.4582	212.8355	-11.5489	217.4576	396.6572	2473.2144
0.499	71.1019	78.9754	127.8644	73.4685	140.4694	211.6172	-13.3376	218.008	395.2043	2471.4002
0.4991	71.0975	78.983	127.7451	73.5263	140.3691	212.8622	-10.9731	217.652	393.7388	2475.292

0.4992	71.1014	78.9699	127.711	73.523	140.3114	211.2939	-11.789	217.9878	395.2801	2474.602
0.4992	71.0761	79.0082	127.7623	73.4888	140.3429	212.3266	-12.7734	218.2187	395.47	2475.7363
0.4993	71.0911	78.9962	127.7439	73.5226	140.3181	211.9372	-11.7574	217.8146	396.2388	2472.1488
0.4994	71.1116	78.985	127.7369	73.4985	140.2681	211.7454	-12.1361	217.4204	394.8167	2473.1235
0.4994	71.0723	78.9969	127.6508	73.5004	140.2112	212.2109	-11.7531	217.804	396.2123	2475.1847
0.4996	71.0738	78.983	127.6375	73.5115	140.1767	211.8652	-12.2163	217.9378	396.2951	2476.6981
0.4997	71.0853	78.9894	127.5897	73.5034	140.0597	211.3227	-11.7637	217.1359	396.1788	2475.3276
0.4998	71.0577	78.9872	127.5709	73.5089	140.0322	209.7984	-11.7333	217.3692	396.6307	2475.2384
0.4999	71.0649	78.9944	127.5815	73.5001	140.0119	210.116	-11.9739	217.7493	396.212	2474.4459
0.5	71.0906	78.9811	127.503	73.4809	139.9101	210.2294	-11.6653	216.7082	394.8882	2473.5901
0.5001	71.0774	78.9968	127.5237	73.4817	139.885	210.1309	-11.8215	217.2874	395.5808	2472.3701
0.5002	71.1009	78.9947	127.4688	73.4766	139.818	211.1573	-12.0731	218.8987	396.0293	2473.8528
0.5003	71.1107	78.9743	127.3794	73.5177	139.7065	211.7959	-11.703	217.606	395.5714	2474.993
0.5004	71.1126	78.9962	127.4547	73.4697	139.7221	210.9818	-12.2493	217.5128	395.5642	2476.3375
0.5005	71.1194	79.0147	127.3708	73.4943	139.6671	211.4965	-11.6331	216.8637	395.725	2473.2681
0.5006	71.107	78.9957	127.333	73.5288	139.6358	212.1374	-11.9866	218.6917	396.0404	2473.5483
0.5006	71.1097	79.0293	127.3397	73.5235	139.5959	211.5924	-12.2269	217.2101	395.2324	2474.1267
0.5007	71.1185	78.9995	127.2377	73.4823	139.5186	212.2767	-11.7365	215.8646	396.4834	2474.5822
0.5008	71.1038	79.0112	127.2459	73.4885	139.512	211.2823	-12.507	217.2631	393.5481	2474.1881
0.5009	71.096	79.0128	127.2125	73.4973	139.4341	211.7259	-11.5218	216.345	395.1378	2473.7005
0.501	71.086	79.0154	127.1922	73.5164	139.4064	211.7053	-12.123	216.6021	395.4602	2475.0084
0.5011	71.1019	78.9881	127.2165	73.4733	139.3884	211.2874	-12.704	218.1559	395.9296	2476.6821
0.5011	71.0608	79.0001	127.1179	73.516	139.3135	210.5679	-11.0834	216.4713	395.5926	2474.855
0.5012	71.0518	79.0145	127.1307	73.5105	139.2858	210.1541	-12.5355	216.6296	396.2342	2473.2918
0.5013	71.0731	79.0098	127.0924	73.4923	139.2383	209.8517	-11.7183	217.0298	395.5926	2474.8934
0.5014	71.0751	79.025	127.0545	73.5167	139.1653	210.4997	-11.8781	217.6902	395.9463	2474.0772
0.5015	71.086	79.0081	127.0409	73.5104	139.1373	211.5302	-12.536	217.1642	394.7452	2474.4487
0.5016	71.0868	78.9909	126.9619	73.5213	139.0929	210.2526	-11.4691	216.9326	395.7635	2474.3017
0.5016	71.0679	79.0266	126.9339	73.5301	139.0569	211.2032	-12.8254	216.747	395.5714	2475.0007
0.5017	71.0807	79.023	126.9303	73.4967	138.9946	209.7741	-11.3699	217.0657	394.5841	2475.1593
0.5018	71.0787	79.0324	126.8363	73.5474	138.9574	211.5915	-11.8417	217.8464	395.1583	2474.2264
0.5019	71.1116	79.0334	126.8799	73.5164	138.9345	211.5261	-12.5064	217.838	396.7824	2477.4756
0.5019	71.0838	79.0278	126.844	73.526	138.8869	210.8238	-12.0667	217.4823	395.7674	2474.4641
0.502	71.0879	79.0295	126.8142	73.5492	138.8287	211.715	-11.6187	217.3727	395.4602	2472.6011
0.5021	71.0771	79.0347	126.8938	73.5333	138.8294	210.822	-12.127	217.025	394.8056	2474.1253
0.5022	71.1155	79.0327	126.8424	73.517	138.7714	212.4561	-12.2831	216.1744	393.9189	2476.7333
0.5022	71.0861	79.0181	126.7368	73.5537	138.7202	212.1346	-11.771	217.4204	396.1456	2476.9145
0.5023	71.0899	79.029	126.8007	73.5206	138.7417	211.468	-12.2587	216.291	394.9888	2476.028
0.5024	71.1302	79.0302	126.7497	73.5172	138.7123	212.4152	-12.2019	215.8668	395.582	2473.8661
0.5024	71.0911	79.0278	126.7151	73.5111	138.5949	211.2521	-11.3708	217.2207	396.5619	2473.7357
0.5025	71.0975	79.0122	126.671	73.5294	138.5842	211.1481	-12.2358	217.4257	395.868	2474.0194
0.5026	71.0983	79.038	126.7294	73.4899	138.6211	211.476	-12.4875	216.5446	395.2319	2474.5581
0.5026	71.098	79.0322	126.7074	73.5057	138.5564	210.0215	-11.1	217.3162	394.5545	2476.166
0.5027	71.1088	79.0382	126.6105	73.5519	138.4879	210.9502	-11.7028	216.7035	395.243	2474.3738
0.5028	71.1007	79.0373	126.6362	73.5401	138.4546	210.1592	-12.4889	215.8138	395.2165	2473.9351
0.5028	71.0889	79.0305	126.5744	73.5331	138.3932	210.5359	-11.5137	217.3338	395.2483	2473.0457
0.5029	71.1193	79.041	126.6069	73.5049	138.4075	209.632	-11.2894	216.1455	395.7801	2474.2776
0.503	71.1053	79.0419	126.5117	73.5323	138.3735	209.9539	-12.4527	217.3303	396.0746	2473.0917
0.5031	71.1114	79.0255	126.4649	73.5687	138.281	210.9548	-11.6786	216.94	395.1046	2476.5779
0.5032	71.1162	79.038	126.4559	73.5366	138.2249	210.6427	-12.2098	216.9326	395.7635	2474.0612
0.5033	71.0755	79.0195	126.4252	73.5242	138.1901	210.846	-11.5354	216.5738	393.7547	2473.9197
0.5034	71.0858	79.0255	126.4425	73.5253	138.1743	211.4109	-11.8603	216.7331	395.913	2475.6883
0.5035	71.0731	79.0306	126.367	73.522	138.1042	211.5726	-12.3263	217.413	395.5199	2473.7727

0.5035	71.0606	79.0533	126.3875	73.5321	138.0957	211.173	-11.6755	215.8209	394.4856	2472.9921
0.5036	71.0801	79.0193	126.3203	73.5243	138.0383	211.5551	-11.7069	216.238	395.1583	2473.3524
0.5037	71.075	79.0482	126.3713	73.5204	138.0511	211.2023	-12.0637	216.793	395.7674	2476.7027
0.5037	71.0868	79.0469	126.3707	73.5054	138.0111	211.7082	-12.0261	215.5763	395.3815	2475.5039
0.5039	71.0621	79.0451	126.359	73.5113	137.9474	211.9256	-11.6692	215.9348	395.2596	2474.6784
0.5039	71.098	79.0468	126.3194	73.5136	137.895	211.2939	-11.9773	215.7961	395.4125	2474.2034
0.5041	71.106	79.0481	126.2339	73.5286	137.803	211.0905	-12.0428	216.2785	395.7967	2475.0471
0.5042	71.1048	79.0414	126.2004	73.5602	137.7505	211.125	-11.6276	215.9976	395.8309	2472.2408
0.5043	71.1269	79.0614	126.193	73.548	137.7127	210.7756	-11.9544	216.9215	396.129	2473.2036
0.5044	71.1185	79.055	126.1122	73.5626	137.6105	210.0952	-11.1847	216.132	394.8511	2475.6294
0.5045	71.1297	79.0492	126.1496	73.5423	137.624	208.1253	-11.9103	215.4815	395.6614	2474.3721
0.5046	71.1157	79.0451	126.1287	73.5256	137.5991	205.5883	-11.9895	211.6812	396.0902	2474.3417
0.5047	71.1011	79.0597	126.0995	73.5301	137.5362	202.2146	-11.4999	209.0444	395.0312	2474.1727
0.5047	71.1108	79.081	126.0905	73.5248	137.4991	198.7485	-11.1659	204.9589	395.4202	2473.0273
0.5048	71.1226	79.0641	126.028	73.5667	137.4627	197.9762	-11.465	203.8764	393.3787	2474.7554
0.5049	71.119	79.0611	126.0108	73.535	137.4619	194.0704	-11.592	200.454	394.5398	2474.4299
0.5049	71.1155	79.0448	125.9729	73.5835	137.3864	193.8231	-11.052	200.5324	395.2112	2473.7664
0.505	71.1068	79.0507	125.9324	73.5323	137.3532	193.3886	-10.7829	199.479	395.4549	2472.6854
0.5051	71.0994	79.0385	125.9503	73.5506	137.3307	191.2685	-11.1645	197.4216	395.5026	2473.6361
0.5052	71.1042	79.0489	125.9602	73.5037	137.2702	192.7968	-11.0549	198.4805	396.6495	2474.6463
0.5053	71.0963	79.0329	125.8838	73.5362	137.2194	193.0216	-11.139	198.5599	395.4708	2475.4914
0.5055	71.085	79.0777	125.9288	73.5214	137.1883	193.0456	-10.673	199.433	396.1434	2476.373
0.5056	71.0621	79.0731	125.8545	73.5358	137.1202	193.6068	-11.3654	198.9535	394.8388	2472.1136
0.5057	71.105	79.0751	125.8839	73.5097	137.0801	193.7452	-10.8312	199.1716	395.7358	2474.1814
0.5058	71.0892	79.0551	125.8528	73.5387	137.0794	193.1051	-10.7994	198.8321	393.2939	2477.3313
0.5058	71.0679	79.0631	125.8194	73.524	136.9868	193.8178	-11.2162	199.4259	395.7462	2472.3328
0.5059	71.0936	79.0838	125.8006	73.5194	136.9847	193.6472	-11.1821	198.7154	395.9633	2472.6624
0.506	71.0963	79.0639	125.7652	73.5286	136.9198	192.2589	-10.6848	199.8848	396.356	2475.4478
0.5061	71.1094	79.068	125.7517	73.5304	136.8696	193.1185	-11.1406	199.4896	394.4538	2472.7238
0.5062	71.1093	79.0769	125.7876	73.5414	136.8875	193.2334	-11.3195	199.4155	394.7557	2473.2677
0.5063	71.1124	79.0709	125.7574	73.4703	136.8017	193.6356	-10.8474	199.5709	394.814	2475.913
0.5065	71.1009	79.0886	125.7715	73.5018	136.7825	192.5791	-11.0316	200.9672	395.1371	2474.487
0.5065	71.1198	79.0772	125.7722	73.5154	136.7183	192.924	-11.314	199.8294	394.2076	2474.7265
0.5066	71.0865	79.067	125.7204	73.5399	136.6628	194.8049	-10.7813	199.235	395.2324	2473.2221
0.5067	71.1098	79.0723	125.6683	73.5621	136.5949	194.5868	-11.1912	199.1901	395.1655	2472.7147
0.5068	71.1075	79.083	125.6837	73.5292	136.6144	194.0079	-11.0072	200.0304	395.1583	2474.6787
0.5069	71.0865	79.0816	125.6491	73.5523	136.5491	195.474	-11.0543	199.8749	394.5704	2473.4981
0.507	71.0942	79.0797	125.648	73.5312	136.5202	194.6593	-11.3557	200.3061	394.8499	2474.7906
0.5072	71.0902	79.0502	125.6166	73.55	136.4641	195.1191	-10.97	199.785	395.6196	2476.2253
0.5073	71.0748	79.0821	125.6436	73.5003	136.4463	194.1794	-11.0655	198.9911	393.903	2473.9351
0.5074	71.0743	79.0853	125.644	73.5245	136.3921	193.8418	-11.1975	198.8316	395.2929	2476.7783
0.5075	71.0909	79.0815	125.5849	73.5508	136.368	193.7304	-10.8976	199.7777	396.0072	2474.4379
0.5076	71.1022	79.113	125.6054	73.5233	136.3214	194.0425	-11.3338	200.077	396.129	2472.0815
0.5078	71.1024	79.0998	125.5179	73.5499	136.2785	193.672	-10.9126	200.4157	395.8468	2472.5398
0.5079	71.0713	79.1204	125.5551	73.5432	136.234	193.9069	-11.1232	200.4503	394.5398	2473.5963
0.5081	71.0991	79.0896	125.4735	73.551	136.1777	194.1958	-11.2517	200.0622	395.0381	2474.494
0.5081	71.0938	79.1035	125.5174	73.5421	136.1426	193.3877	-10.9688	201.3242	395.2695	2475.4914
0.5082	71.1239	79.0965	125.4426	73.5761	136.0874	195.1981	-11.1842	200.1916	394.8776	2476.3695
0.5084	71.1193	79.0792	125.4785	73.5133	136.0784	194.545	-10.9452	200.4392	394.7779	2474.1333
0.5085	71.0975	79.0925	125.4011	73.5352	136.0054	194.2603	-10.9342	200.6702	394.814	2473.2987
0.5087	71.1331	79.1232	125.448	73.5467	135.9952	195.5931	-11.3877	199.4118	395.0841	2472.8464
0.5087	71.1009	79.1117	125.4035	73.5616	135.9615	195.081	-11.0398	200.6646	395.6196	2474.2456
0.5088	71.0958	79.0981	125.4223	73.5741	135.915	195.1924	-10.939	199.9562	394.9835	2474.1651

0.5089	71.0836	79.1006	125.4216	73.5318	135.9095	194.8805	-11.6036	200.4723	393.9613	2476.143
0.509	71.0868	79.1232	125.4411	73.5312	135.8624	194.9296	-10.8645	200.2211	394.9108	2472.2979
0.5091	71.0635	79.1098	125.3562	73.5747	135.7945	194.3011	-11.1603	200.999	395.9898	2475.7674
0.5092	71.0756	79.1146	125.3567	73.5545	135.766	193.4238	-11.4774	200.5907	393.4102	2473.396
0.5093	71.069	79.113	125.2925	73.5347	135.7045	193.6458	-10.678	200.465	395.16	2474.3497
0.5094	71.0811	79.1079	125.3083	73.5525	135.7231	194.2532	-11.3645	201.1474	395.1159	2472.4784
0.5095	71.0835	79.1072	125.2832	73.5635	135.6978	194.0796	-11.0082	200.7053	396.0238	2477.0428
0.5097	71.1014	79.1159	125.2842	73.5572	135.6136	193.7431	-10.7017	200.6455	394.475	2474.579
0.5097	71.0902	79.096	125.275	73.5526	135.6276	193.8	-11.5464	200.4244	394.8167	2471.8972
0.5098	71.0801	79.0972	125.2689	73.5513	135.6435	194.4806	-11.3035	201.6317	394.7134	2472.2638
0.5099	71.1065	79.1113	125.2564	73.5727	135.6144	194.6263	-10.8284	201.0909	394.6445	2473.9504
0.5099	71.1124	79.0952	125.2365	73.5498	135.5542	195.6162	-11.5027	200.8328	395.8097	2469.8642
0.51	71.1214	79.1261	125.253	73.535	135.5659	194.7037	-11.5173	200.2708	394.0195	2474.7247
0.5101	71.1318	79.0993	125.1798	73.5852	135.5005	195.6347	-10.7846	199.8922	394.8443	2475.1272
0.5101	71.1036	79.1011	125.1898	73.5606	135.4839	195.1844	-11.2272	199.8819	395.5184	2476.6873
0.5102	71.1147	79.1153	125.2069	73.5671	135.4903	195.3699	-11.6868	201.0194	395.5586	2473.5963
0.5103	71.1168	79.1142	125.1807	73.5586	135.4416	195.7504	-10.8632	200.041	395.8574	2474.6634
0.5103	71.0968	79.1283	125.0991	73.5679	135.4127	194.6459	-10.5675	200.4687	395.582	2473.6514
0.5104	71.1198	79.1255	125.0968	73.5998	135.3632	195.6904	-11.2671	199.7111	395.1101	2472.9551
0.5105	71.1141	79.1456	125.1464	73.5748	135.4336	194.8032	-11.4926	199.5603	394.438	2475.0007
0.5106	71.093	79.1268	125.19	73.5574	135.4262	193.9431	-10.3121	200.6129	395.9352	2475.7604
0.5106	71.0868	79.133	125.1881	73.5443	135.4039	195.0804	-10.5999	201.812	394.385	2473.9044
0.5107	71.0882	79.1149	125.184	73.5401	135.4022	193.7582	-11.5521	200.9177	395.582	2474.9854
0.5108	71.1097	79.1266	125.0729	73.5631	135.3391	194.5917	-11.1478	200.5076	396.5354	2475.0007
0.5108	71.1075	79.1366	125.1089	73.5559	135.3322	193.3326	-10.6546	200.0693	396.207	2474.602
0.5109	71.1065	79.1234	125.1055	73.5257	135.2742	193.106	-11.5044	200.4334	395.4655	2473.6744
0.511	71.1109	79.1449	125.1	73.5371	135.2996	193.7378	-11.1283	201.9393	395.0206	2475.0697
0.5111	71.0855	79.1317	125.0953	73.5738	135.2474	194.6788	-10.9395	200.7975	396.0375	2475.7827
0.5112	71.1016	79.1551	125.0492	73.5437	135.1968	193.3282	-11.2747	201.2535	394.2791	2474.0731
0.5112	71.0864	79.1532	125.0427	73.5495	135.1777	194.545	-11.4112	199.9772	394.2297	2473.2116
0.5113	71.0823	79.1466	125.028	73.5702	135.1581	193.1275	-10.6699	200.7644	396.5	2472.2899
0.5114	71.0945	79.1334	125.0324	73.5773	135.1328	194.4568	-11.5101	201.7474	395.1434	2475.2955
0.5115	71.0897	79.1261	124.9977	73.5887	135.0956	195.3576	-11.461	200.3203	395.7727	2474.717
0.5116	71.0626	79.1474	124.9379	73.6031	135.0808	195.0225	-10.6234	201.2337	393.4933	2472.1697
0.5116	71.1012	79.1449	124.9577	73.5989	135.1032	194.4193	-11.1407	201.2358	394.6445	2473.2604
0.5117	71.0953	79.1774	124.9781	73.5345	135.0637	195.905	-11.465	200.5611	393.9473	2477.9164
0.5118	71.106	79.1499	124.9371	73.5691	135.0776	195.6616	-10.8579	202.0357	394.8167	2475.2154
0.5119	71.107	79.1361	124.9003	73.5817	135.0532	195.5629	-11.4506	201.1439	394.385	2475.3687
0.512	71.1314	79.1361	124.8839	73.5674	134.9894	195.5842	-11.3246	201.5822	394.6021	2474.7094
0.5121	71.1083	79.1751	124.9038	73.5809	135.0146	194.8674	-10.9566	200.8789	394.8056	2474.6543
0.5122	71.128	79.1336	124.8868	73.5712	135.025	195.3467	-11.2658	200.3431	397.2973	2476.1691
0.5122	71.1277	79.1537	124.9251	73.5594	134.9737	195.1331	-11.0986	200.9639	395.4756	2476.8985
0.5124	71.1143	79.1507	124.892	73.5513	134.9666	194.6574	-11.1808	201.2146	392.8755	2474.4334
0.5124	71.138	79.1524	124.8928	73.5179	134.946	193.8835	-11.0558	200.0481	395.2377	2475.407
0.5126	71.1016	79.1356	124.789	73.5777	134.8498	193.959	-11.0567	200.8258	395.5237	2472.2331
0.5127	71.0692	79.1446	124.8348	73.561	134.8716	194.2354	-11.1763	200.5854	394.7769	2474.1114
0.5129	71.0843	79.169	124.8044	73.5865	134.7816	193.2631	-10.744	201.7548	395.1267	2473.1635
0.513	71.0858	79.1563	124.8263	73.5865	134.7895	193.3886	-11.1995	202.0983	394.1043	2473.0227
0.5131	71.1134	79.1751	124.859	73.5658	134.8161	195.2993	-11.2603	201.2189	393.5597	2474.9669
0.5131	71.1117	79.1553	124.887	73.5559	134.8049	195.0546	-10.5565	201.7979	396.5883	2475.982
0.5132	71.119	79.148	124.8021	73.5789	134.7678	194.2354	-10.927	201.1651	394.0619	2470.8761
0.5133	71.106	79.1668	124.8455	73.572	134.7516	194.9009	-10.9715	200.5536	394.4168	2473.7127
0.5134	71.1387	79.1621	124.8598	73.5589	134.7721	194.977	-10.5122	200.4613	395.6362	2475.8806

0.5135	71.1268	79.1631	124.8267	73.5845	134.721	194.2123	-11.2958	201.1368	394.5545	2474.6864
0.5136	71.1192	79.1945	124.8379	73.5593	134.6894	194.7063	-10.679	201.5716	395.0047	2475.1234
0.5137	71.1231	79.1492	124.8339	73.5834	134.6072	194.3082	-11.1464	201.3076	394.6671	2472.9391
0.5138	71.1239	79.1529	124.7895	73.5587	134.6626	193.8	-11.037	200.695	394.6021	2476.442
0.5139	71.1246	79.1634	124.7446	73.603	134.6084	193.1451	-10.953	201.7519	395.3225	2473.0381
0.514	71.1165	79.1505	124.7334	73.5745	134.7579	193.8942	-10.9829	200.7939	394.8034	2475.66
0.5142	71.1083	79.1929	124.7438	73.578	134.5747	193.8214	-11.1122	201.1155	394.5675	2474.5421
0.5143	71.0914	79.1838	124.7276	73.5808	134.5273	195.0431	-10.8783	200.9884	395.2536	2475.9284
0.5145	71.0935	79.1909	124.6965	73.573	134.4903	193.3783	-11.0929	200.3468	394.0636	2473.2998
0.5145	71.1175	79.169	124.667	73.6117	134.4609	193.9487	-10.976	201.1007	394.5786	2474.6703
0.5149	71.1422	79.1809	124.6099	73.6287	134.3459	195.3452	-10.9571	201.1156	394.5386	2474.9777
0.515	71.1379	79.1639	124.6114	73.6135	134.3658	195.7555	-10.6561	199.7814	394.3792	2477.8443
0.5151	71.1154	79.185	124.5263	73.649	134.3084	195.9533	-10.9994	200.7976	394.8831	2476.2493
0.5151	71.1443	79.1906	124.5149	73.6679	134.2871	195.2241	-10.6741	200.9344	394.0193	2474.0692
0.5153	71.1361	79.1772	124.5352	73.6206	134.3119	196.0827	-10.7421	202.0594	392.7802	2476.9557
0.5153	71.1124	79.178	124.5281	73.6329	134.293	194.2052	-10.5832	201.4514	394.957	2474.5254
0.5154	71.1154	79.1848	124.4714	73.6489	134.281	195.2037	-10.8667	200.4022	394.9053	2473.7486
0.5155	71.1388	79.1824	124.4798	73.6226	134.2663	194.2434	-10.6653	200.6844	394.3744	2477.155
0.5157	71.0953	79.1927	124.4223	73.6191	134.2321	194.0221	-10.7825	201.3224	395.2264	2473.42
0.5158	71.1045	79.1662	124.446	73.628	134.221	193.6969	-10.7647	200.9011	393.1112	2473.0754
0.5159	71.1114	79.1858	124.4817	73.6237	134.2416	193.1721	-10.4176	200.4761	393.2053	2474.2616
0.516	71.094	79.1914	124.4588	73.613	134.2436	194.0992	-10.3444	201.6513	394.5786	2473.0273
0.516	71.0997	79.1848	124.4269	73.6514	134.1898	194.0204	-10.5987	202.0665	395.1106	2476.4497
0.5161	71.0929	79.1804	124.4307	73.6406	134.215	193.242	-10.7235	201.3242	395.0947	2472.0184
0.5162	71.0994	79.1687	124.3952	73.6015	134.1455	194.8293	-10.2222	200.8642	396.2785	2473.388
0.5163	71.1116	79.1886	124.4176	73.6551	134.1678	194.7726	-10.4034	201.3779	393.9639	2473.8368
0.5164	71.1236	79.2031	124.3827	73.6117	134.1206	195.774	-10.916	200.9602	396.212	2474.3097
0.5165	71.1202	79.2077	124.3743	73.6196	134.1422	194.5748	-10.5377	201.052	394.8564	2473.8814
0.5166	71.1232	79.2082	124.3729	73.6425	134.1147	195.8534	-10.5459	200.8611	394.2844	2474.9087
0.5167	71.1331	79.1845	124.2872	73.6594	134.0702	196.2469	-10.5622	200.4429	393.9085	2473.2357
0.5168	71.129	79.1872	124.3233	73.643	134.0558	194.876	-10.4355	201.2888	394.1572	2473.6284
0.5169	71.1256	79.1911	124.3355	73.6506	134.0821	195.7806	-10.7518	201.0697	394.6604	2475.7214
0.5169	71.1436	79.214	124.3171	73.6196	134.0591	195.6046	-10.4253	200.398	393.7335	2476.7027
0.517	71.1292	79.1996	124.2937	73.625	134.0239	195.2821	-10.2355	200.0587	396.0693	2473.2374
0.5171	71.119	79.2163	124.2487	73.6813	134.0096	194.8702	-10.4474	200.0955	394.3349	2473.7246
0.5172	71.1109	79.1802	124.2368	73.6564	134.02	195.1777	-10.5951	201.3113	393.6095	2474.2375
0.5172	71.1083	79.2031	124.3131	73.6553	133.9892	193.5808	-10.2415	200.805	394.8942	2472.4742
0.5174	71.0845	79.1916	124.2687	73.6701	133.9609	193.1416	-10.0293	199.7193	394.6445	2474.74
0.5174	71.0985	79.2055	124.2679	73.645	133.9959	194.8343	-10.7062	201.3913	394.2314	2475.7904
0.5175	71.116	79.2311	124.2582	73.6349	133.9569	193.748	-10.401	201.0748	393.1112	2473.7727
0.5176	71.1088	79.2108	124.1954	73.6538	133.8737	194.3847	-9.9998	201.4408	393.5799	2474.2494
0.5177	71.1075	79.2096	124.2589	73.6626	133.9084	193.8906	-10.2932	201.3878	393.6329	2473.0457
0.5178	71.0833	79.2316	124.2163	73.661	133.9177	194.2645	-10.3669	201.4333	393.3437	2474.1414
0.5179	71.1045	79.2044	124.1834	73.6605	133.8949	195.6393	-9.9758	200.2433	393.9473	2474.1414
0.518	71.0924	79.2262	124.1675	73.6764	133.8887	195.0484	-10.5269	201.2464	395.9845	2476.5187
0.5181	71.1009	79.2274	124.1961	73.6423	133.8649	196.4959	-10.2422	200.9919	393.2992	2473.2987
0.5182	71.0963	79.2276	124.1576	73.6371	133.8409	195.1142	-9.8511	200.7374	394.4062	2475.4837
0.5183	71.0802	79.2285	124.2208	73.6145	133.9147	194.8135	-10.5209	200.7903	394.0414	2474.486
0.5183	71.1034	79.2128	124.2004	73.6101	133.8692	195.9245	-10.3301	200.391	395.2218	2475.982
0.5184	71.1244	79.214	124.1368	73.6485	133.8534	194.873	-9.8349	201.9322	394.8277	2471.7529
0.5185	71.1251	79.2125	124.1477	73.6562	133.8405	194.8369	-10.3331	201.1439	393.8659	2474.7554
0.5186	71.1229	79.1998	124.1544	73.6564	133.8138	195.4043	-9.9407	200.9048	394.3737	2477.179
0.5188	71.1256	79.2349	124.129	73.6419	133.8028	193.3699	-10.1494	199.6451	394.2049	2476.626

0.5189	71.1428	79.2069	124.0711	73.7038	133.7905	194.6231	-10.3356	200.9455	394.7059	2472.8429
0.519	71.1329	79.2568	124.172	73.6445	133.8267	193.3921	-9.8748	201.5045	393.1986	2475.7674
0.519	71.1166	79.2064	124.1095	73.6879	133.7573	193.8195	-10.2768	200.596	394.099	2475.016
0.5191	71.1378	79.2179	124.1183	73.6628	133.8017	195.3008	-10.3009	201.2111	394.2473	2474.6787
0.5192	71.0953	79.2207	124.0986	73.6324	133.7756	194.7225	-10.252	201.0046	394.1799	2475.6802
0.5193	71.0991	79.2117	124.0698	73.6489	133.7494	194.0378	-9.98	201.3002	393.82	2474.3898
0.5194	71.1021	79.231	124.0685	73.6435	133.7592	195.0306	-10.2325	201.8827	394.0778	2473.4827
0.5194	71.1063	79.2133	124.1033	73.6304	133.7678	195.8588	-10.2221	200.649	394.0036	2472.7238
0.5195	71.1102	79.2366	124.0705	73.6627	133.7589	195.3452	-10.3213	202.0488	394.5757	2472.3021
0.5196	71.1099	79.2224	124.0689	73.6913	133.7236	194.8869	-10.2044	201.1413	393.532	2474.2936
0.5197	71.106	79.2288	124.038	73.6699	133.678	195.7582	-10.1386	201.4555	393.8144	2472.7628
0.5197	71.0958	79.2288	124.0245	73.6842	133.6993	196.0936	-9.9593	200.162	393.82	2474.3738
0.5199	71.1019	79.2381	124.0109	73.6828	133.6829	195.977	-10.3253	200.4758	392.5948	2475.8977
0.5199	71.1122	79.2337	123.9644	73.6762	133.6579	195.4145	-9.942	201.6565	393.9348	2474.5484
0.5202	71.151	79.2505	123.9746	73.6501	133.6087	195.6278	-10.2603	200.8788	393.8289	2475.3534
0.5203	71.1392	79.2135	123.9059	73.6752	133.5986	194.6147	-10.0387	201.2855	394.4844	2471.7289
0.5205	71.1322	79.2293	123.8957	73.662	133.6038	194.8823	-10.3118	200.4687	395.1106	2475.66
0.5206	71.1334	79.2256	123.9271	73.6747	133.6066	193.6978	-10.1355	201.3383	393.3045	2474.5177
0.5207	71.152	79.232	123.9152	73.6259	133.6209	193.5139	-9.9471	201.7342	395.0523	2474.9164
0.5208	71.1344	79.2418	123.8314	73.6398	133.5517	194.833	-9.9348	201.7178	394.2131	2474.3417
0.5208	71.1298	79.2342	123.8205	73.6828	133.5336	194.2238	-9.6259	201.561	394.5227	2474.0731
0.5209	71.1234	79.241	123.8852	73.6744	133.5904	194.2357	-10.2546	201.0526	393.1887	2475.3276
0.521	71.1166	79.2211	123.824	73.6839	133.5728	195.6375	-10.1494	200.7798	394.0142	2474.6787
0.5211	71.1293	79.2418	123.8002	73.6819	133.5405	195.9087	-9.67	200.8124	393.2994	2473.2517
0.5212	71.0916	79.2181	123.8301	73.673	133.5551	194.0346	-10.1167	201.1333	395.1954	2473.1684
0.5212	71.1065	79.2497	123.8254	73.6592	133.5681	195.6338	-10.2842	200.5648	393.7535	2474.3578
0.5213	71.1061	79.2374	123.8589	73.6659	133.5624	195.1159	-10.1487	201.5964	394.0778	2473.9427
0.5215	71.1004	79.2293	123.7983	73.6625	133.4973	194.8574	-9.8254	201.2252	394.5598	2475.4147
0.5215	71.0999	79.2361	123.7723	73.6676	133.4856	195.3523	-10.0652	199.6486	393.7494	2474.6174
0.5216	71.143	79.2199	123.7733	73.6671	133.4616	195.5065	-10.1399	200.0659	393.4102	2474.8707
0.5217	71.1346	79.2366	123.7751	73.6486	133.4647	194.717	-10.1692	200.5288	394.5068	2474.1651
0.5218	71.1405	79.2254	123.7754	73.6781	133.4459	194.4389	-9.8652	200.7727	395.3913	2474.1727
0.5218	71.1239	79.2235	123.7637	73.6686	133.4414	194.6957	-9.9949	201.5858	393.5693	2474.7017
0.522	71.1354	79.2495	123.7422	73.6686	133.4058	193.9786	-10.1221	201.098	394.4962	2475.2307
0.5222	71.1398	79.2344	123.7307	73.6813	133.3777	194.5686	-10.0198	200.6419	393.7653	2474.2877
0.5223	71.11	79.2486	123.7568	73.6811	133.3846	194.6779	-10.2784	201.2641	393.6964	2473.3294
0.5225	71.0977	79.2461	123.7599	73.6647	133.3996	193.84	-9.8746	201.2323	394.3956	2475.1157
0.5226	71.0934	79.2466	123.7338	73.6893	133.3332	195.363	-10.1237	201.0555	393.0979	2473.0917
0.5227	71.0997	79.2335	123.7811	73.7059	133.3684	195.8712	-10.1476	200.444	393.0979	2476.5877
0.5228	71.1078	79.2102	123.7173	73.6864	133.3188	194.6054	-9.7498	200.6055	394.2131	2473.6845
0.5229	71.1313	79.254	123.726	73.6979	133.3027	195.513	-10.1855	200.72	394.274	2472.4342
0.523	71.1366	79.2629	123.7038	73.6928	133.2962	195.3034	-9.7221	201.7731	394.6975	2472.5628
0.5231	71.1322	79.2537	123.6751	73.7293	133.2391	195.9263	-10.1972	202.5791	393.6647	2476.6413
0.5232	71.1432	79.2524	123.6887	73.714	133.3026	196.2009	-10.0545	201.6883	392.0122	2474.487
0.5233	71.1324	79.2563	123.6429	73.7135	133.2831	194.4264	-9.6261	201.1192	394.242	2472.8848
0.5233	71.141	79.2382	123.6874	73.6916	133.2692	195.6654	-10.0093	200.3172	393.3216	2474.7345
0.5234	71.139	79.2565	123.7111	73.6902	133.2182	194.2162	-10.2241	201.8805	392.5353	2473.1154
0.5235	71.1642	79.2515	123.694	73.7047	133.2009	194.5322	-9.1791	201.0591	394.0036	2474.8704
0.5236	71.1527	79.2522	123.6837	73.7015	133.2334	193.7413	-10.1951	201.1793	394.5651	2474.8474
0.5237	71.1422	79.249	123.68	73.6855	133.2511	193.7973	-10.1995	201.2712	393.7176	2473.5747
0.5237	71.1454	79.2629	123.6474	73.6991	133.212	193.6858	-9.5511	199.9809	393.4268	2475.5119
0.5239	71.138	79.253	123.5736	73.6874	133.1807	194.5813	-10.0572	200.4133	393.377	2472.4823
0.524	71.1305	79.2568	123.6326	73.7029	133.2301	194.3322	-9.6808	200.9954	393.6223	2475.7214

0.524	71.1202	79.249	123.6451	73.684	133.2353	193.529	-9.8892	201.052	392.7907	2476.9557
0.5241	71.1	79.2459	123.6277	73.676	133.2157	194.6912	-10.1191	200.2602	392.8225	2472.2868
0.5242	71.1063	79.2672	123.624	73.6727	133.221	193.5523	-9.8183	200.7311	394.6284	2473.1555
0.5243	71.1119	79.2432	123.6336	73.6479	133.2263	194.8476	-10.1578	201.7767	393.6382	2475.683
0.5244	71.1107	79.2858	123.5899	73.7008	133.1471	195.6864	-9.8365	200.8046	391.7103	2473.7434
0.5245	71.1227	79.2588	123.5689	73.6891	133.1904	195.5664	-9.6363	200.9177	393.3787	2475.3917
0.5246	71.1048	79.2682	123.5544	73.6831	133.1591	196.1224	-10.0938	200.6387	393.1555	2477.1069
0.5247	71.0963	79.269	123.5665	73.6842	133.1833	195.618	-9.9443	200.4793	394.5863	2472.1258
0.5248	71.1378	79.252	123.6071	73.6598	133.1856	195.9823	-10.1689	200.9071	394.9941	2472.6548
0.5249	71.141	79.2611	123.5741	73.693	133.1663	195.5966	-9.537	201.8361	393.748	2472.9391
0.525	71.1313	79.2413	123.5791	73.6879	133.1563	194.0146	-9.8735	200.55	394.3681	2476.642
0.5251	71.1283	79.2611	123.5469	73.6933	133.1491	195.0866	-10.2535	200.8974	392.3581	2475.4398
0.5251	71.1518	79.2634	123.5269	73.712	133.1058	194.9924	-9.6087	200.2496	393.2621	2474.4564
0.5252	71.1464	79.2435	123.5158	73.7201	133.1541	194.5179	-9.881	200.702	394.7769	2473.6437
0.5253	71.1449	79.2493	123.5049	73.6798	133.1172	193.5734	-9.6352	201.0308	393.7918	2473.1837
0.5254	71.1469	79.2568	123.4708	73.7303	133.0708	194.0313	-9.9194	201.3039	394.0248	2474.5421
0.5255	71.1386	79.2673	123.4751	73.6957	133.0471	194.6619	-10.1336	201.2075	394.4009	2474.0961
0.5256	71.1104	79.2866	123.501	73.6795	133.0289	194.0824	-9.4782	200.7976	394.7447	2473.2196
0.5256	71.1334	79.2865	123.43	73.735	133.0331	194.789	-9.8622	201.1722	394.1361	2473.6054
0.5257	71.1031	79.2636	123.4145	73.724	133.0081	194.677	-10.1388	201.1899	394.6869	2475.1694
0.5258	71.1323	79.2677	123.4349	73.6833	133.0177	194.572	-9.8687	201.4481	394.3349	2473.925
0.5259	71.1255	79.2736	123.3798	73.7367	133.0001	195.735	-9.9626	200.6461	393.7535	2476.073
0.5261	71.0961	79.2639	123.3911	73.7343	132.9896	196.3279	-9.9936	200.1188	393.0979	2474.3261
0.5262	71.1288	79.2892	123.4164	73.7259	133.0028	195.5149	-9.9175	201.865	392.1869	2475.177
0.5262	71.1398	79.2751	123.4019	73.7185	133.0122	196.1001	-10.0973	200.8272	394.5564	2474.9348
0.5263	71.139	79.28	123.4417	73.6908	133.0043	195.426	-9.5742	200.8929	394.2155	2473.4291
0.5264	71.1466	79.2667	123.4134	73.7329	133.0212	194.5385	-9.6281	201.0526	394.3349	2473.0032
0.5265	71.1483	79.2746	123.3973	73.6893	132.9815	195.6189	-10.1489	199.9102	393.6382	2473.5977
0.5265	71.1315	79.2675	123.3348	73.7084	132.9549	195.0893	-9.8796	200.4723	393.6435	2475.131
0.5266	71.1476	79.269	123.3307	73.714	132.9556	195.2723	-9.708	200.8929	393.9666	2476.3653
0.5268	71.1415	79.2824	123.3791	73.7195	132.9399	193.3282	-9.7504	201.5822	393.67	2475.269
0.5269	71.1449	79.2907	123.3227	73.6813	132.938	194.0097	-9.8993	201.7837	393.2198	2474.3031
0.527	71.1349	79.2661	123.2851	73.7259	132.9458	194.4113	-9.7145	201.4161	394.7028	2474.901
0.5271	71.1308	79.2789	123.3124	73.7265	132.9379	193.8465	-10.012	201.8139	393.6926	2473.3559
0.5272	71.1366	79.2654	123.2704	73.7181	132.9026	195.1755	-10.0569	200.4723	393.76	2473.8354
0.5273	71.1273	79.2853	123.2219	73.7369	132.8995	194.7472	-9.8901	201.1474	394.5227	2476.8637
0.5274	71.1034	79.2517	123.2828	73.704	132.9173	195.1595	-9.9276	201.0273	393.331	2475.3917
0.5275	71.13	79.2807	123.2689	73.7459	132.9463	195.8792	-9.8919	200.9459	393.813	2470.4008
0.5278	71.1071	79.2992	123.2569	73.7239	132.9225	196.2853	-9.8759	201.0697	393.0609	2474.4027
0.5279	71.1387	79.2894	123.21	73.7392	132.8683	195.3504	-10.1436	201.6033	395.5254	2475.2795
0.528	71.1359	79.289	123.1756	73.7383	132.8961	195.5922	-9.6711	202.2857	391.2971	2473.2067
0.5281	71.1109	79.2591	123.2357	73.6992	132.8914	194.9575	-9.747	200.4687	394.3847	2475.3276
0.5281	71.129	79.287	123.2391	73.7204	132.8643	195.9681	-10.1589	201.3984	393.2727	2474.6404
0.5282	71.1226	79.2759	123.2062	73.6996	132.8819	195.2947	-9.867	201.4555	393.0447	2472.2979
0.5283	71.1237	79.2744	123.2076	73.7198	132.8733	194.7774	-10.0571	199.79	393.1721	2474.0654
0.5284	71.1191	79.2876	123.2547	73.7109	132.8904	194.153	-9.7378	201.1339	394.2408	2475.8966
0.5285	71.1102	79.2853	123.2066	73.7043	132.8415	194.7747	-9.5618	200.7798	393.4634	2477.661
0.5285	71.1557	79.2916	123.2384	73.6659	132.8517	193.2944	-9.8129	201.1368	392.902	2474.2954
0.5286	71.1507	79.2962	123.2614	73.6897	132.8673	194.0193	-10.39	200.8235	393.5929	2476.065
0.5287	71.1415	79.2873	123.2964	73.6618	132.8738	194.9142	-9.0562	201.3701	394.0937	2474.1114
0.5288	71.1591	79.2951	123.4748	73.6075	132.9303	194.924	-10.2847	201.4903	394.0142	2473.8967
0.5289	71.1625	79.2825	123.5134	73.5952	132.9666	193.5	-9.3078	200.7237	393.9362	2474.7986
0.529	71.1503	79.2912	123.4319	73.649	132.9351	194.3856	-9.2396	200.7763	392.8384	2474.1267

0.529	71.1688	79.3121	123.4009	73.6198	132.9113	195.5496	-9.9221	200.8434	394.0195	2473.2604
0.5292	71.149	79.3072	123.3951	73.6427	132.8837	194.6574	-9.6754	201.0452	395.2652	2474.1414
0.5293	71.1537	79.2897	123.3928	73.6042	132.8938	194.9667	-9.9443	200.6738	393.1562	2476.2503
0.5294	71.1469	79.2822	123.3358	73.6509	132.8693	196.0016	-9.4416	200.1879	392.9672	2473.6605
0.5295	71.1608	79.3089	123.293	73.6534	132.8633	194.7934	-9.818	201.8261	393.9666	2472.6854
0.5296	71.152	79.2899	123.2931	73.6634	132.8417	195.5502	-10.2568	201.06	394.0248	2475.7043
0.5297	71.15	79.3031	123.2558	73.6861	132.8357	195.4189	-9.698	200.7586	392.653	2474.4104
0.5298	71.1259	79.2887	123.2615	73.6847	132.8367	195.2439	-9.9072	200.8152	393.0556	2474.8474
0.53	71.1242	79.3041	123.2741	73.6854	132.8564	194.6814	-9.7094	201.3772	393.1032	2474.6097
0.5301	71.1347	79.3031	123.2118	73.6798	132.8253	194.4967	-9.8466	200.7533	393.4822	2472.4181
0.5303	71.1426	79.283	123.1239	73.7022	132.7652	192.911	-9.6904	200.6498	393.2275	2472.6666
0.5305	71.1469	79.3145	123.0784	73.7049	132.7138	194.7561	-9.987	201.3207	393.5958	2473.6897
0.5306	71.1273	79.3072	123.0774	73.7161	132.7366	193.9048	-9.6101	201.0202	393.67	2473.4444
0.5306	71.1377	79.3087	123.079	73.7277	132.7726	194.9426	-10.0273	201.4665	394.2076	2473.7086
0.5307	71.1518	79.2926	123.0691	73.7125	132.7164	195.682	-9.8794	201.6176	392.9973	2473.9044
0.5308	71.1487	79.2968	123.0683	73.7142	132.7445	195.3235	-9.6834	200.6794	392.4965	2471.8571
0.5309	71.1564	79.3171	123.0755	73.7369	132.7442	194.8609	-9.7551	201.5663	394.3626	2474.2055
0.531	71.1782	79.2824	123.0793	73.7181	132.729	195.1462	-9.7091	200.0269	392.6795	2475.016
0.5311	71.1357	79.3092	123.0106	73.7471	132.697	195.9152	-9.7698	201.1302	394.5066	2474.5982
0.5312	71.1551	79.2879	122.9971	73.7767	132.7184	195.016	-10.0416	201.1487	393.4047	2472.6426
0.5313	71.1632	79.3308	122.9906	73.7127	132.6929	195.2395	-9.7671	201.1722	393.6964	2472.2254
0.5314	71.1308	79.3082	123.008	73.7452	132.6722	194.964	-9.559	201.0166	393.7547	2474.4104
0.5316	71.1214	79.3051	123.0021	73.7257	132.6638	193.6263	-9.8448	200.8753	393.1223	2473.3559
0.5317	71.1359	79.3171	122.9869	73.7254	132.6883	194.5237	-9.7049	201.3483	393.5376	2475.2715
0.5319	71.119	79.3038	123.039	73.6964	132.6936	193.8933	-10.0432	199.8254	396.0481	2474.6404
0.5319	71.1344	79.3232	123.0478	73.7085	132.6669	194.6268	-9.8415	200.1361	393.7867	2476.4737
0.532	71.1234	79.3276	123.0693	73.7029	132.6905	193.0083	-9.5147	200.9566	393.2992	2476.741
0.5321	71.1334	79.3273	123.025	73.6878	132.699	194.4466	-9.8402	200.6166	393.9916	2476.2172
0.5322	71.13	79.3245	123.0741	73.6932	132.7023	193.4828	-9.7442	200.9672	391.9115	2473.9964
0.5322	71.1129	79.3342	123.0663	73.6828	132.6946	193.4126	-9.7978	199.9986	393.7282	2474.2111
0.5323	71.1165	79.3181	123.0687	73.6943	132.6928	195.8335	-9.7283	201.0305	393.6871	2476.2733
0.5324	71.1378	79.3104	123.0543	73.6754	132.7254	195.0946	-9.493	200.5253	392.8596	2475.1847
0.5324	71.1474	79.326	123.0278	73.6754	132.7092	193.7248	-9.5811	200.6203	393.82	2474.0772
0.5325	71.1335	79.3255	123.0051	73.713	132.6337	195.2226	-9.9413	200.2354	392.8861	2475.292
0.5326	71.1273	79.3161	122.9282	73.7037	132.6299	195.67	-9.7669	201.0046	393.9639	2474.5181
0.5327	71.1293	79.3457	122.9667	73.7298	132.6358	195.9787	-9.8706	200.3768	394.2155	2476.902
0.5328	71.1611	79.3165	122.9566	73.7634	132.6234	195.841	-9.6934	201.3242	393.3575	2474.3951
0.533	71.1234	79.3228	123.0083	73.6845	132.651	193.7102	-9.7224	200.6596	392.653	2474.786
0.5331	71.1362	79.2995	123.0061	73.6991	132.6453	193.4981	-9.51	200.8235	393.4822	2472.5063
0.5332	71.1261	79.3206	123.0058	73.7137	132.6367	193.5805	-9.5953	199.4754	393.2409	2469.4042
0.5333	71.1285	79.3199	122.9921	73.7001	132.6264	193.8948	-9.9359	201.1339	391.965	2477.1149
0.5333	71.1259	79.3276	122.98	73.7142	132.6158	193.7645	-9.6644	200.2354	392.2611	2474.7017
0.5334	71.1163	79.3484	122.9961	73.6634	132.6255	192.4819	-9.4293	200.1768	393.8919	2472.2899
0.5335	71.1159	79.3371	122.9917	73.6993	132.656	192.7942	-9.5718	201.0909	393.813	2473.8124
0.5336	71.1535	79.3143	122.9337	73.6991	132.608	193.1693	-9.6303	200.8974	393.078	2474.8627
0.5339	71.116	79.3532	122.7755	73.7721	132.5773	195.4666	-9.8725	201.0009	393.0281	2474.8948
0.5339	71.1525	79.3515	122.8409	73.7317	132.5827	195.0532	-9.7551	199.4561	393.5043	2471.3201
0.534	71.1208	79.3201	122.8303	73.7051	132.5808	193.7636	-9.6744	201.4302	393.5164	2474.6097
0.5341	71.1822	79.3403	122.7925	73.7639	132.5718	193.9979	-9.6592	201.1487	393.6926	2476.1611
0.5343	71.1671	79.338	122.7802	73.7386	132.6043	195.6068	-10.037	199.8257	393.3105	2475.576
0.5343	71.1503	79.3447	122.7262	73.7866	132.5247	195.6944	-9.7883	200.3273	393.9878	2475.2307
0.5345	71.142	79.3388	122.7604	73.7679	132.5659	195.8694	-9.7586	200.9742	393.9401	2474.786
0.5347	71.1659	79.3457	122.726	73.7864	132.5269	194.2727	-9.6409	201.3419	393.5217	2473.1991

0.5348	71.1594	79.3227	122.7432	73.7799	132.56	194.6277	-9.53	199.9698	393.0669	2474.2616
0.5349	71.1331	79.3347	122.6749	73.7739	132.487	194.7894	-9.7974	200.9455	393.4102	2474.9909
0.5351	71.1275	79.3571	122.7016	73.7807	132.5434	193.5195	-9.6388	201.8768	393.4933	2474.502
0.5352	71.1415	79.3359	122.7109	73.7709	132.5285	194.1092	-9.3637	200.6844	393.278	2474.0961
0.5353	71.1273	79.3415	122.7221	73.7532	132.5812	194.1967	-9.8709	201.9544	391.5331	2473.8929
0.5353	71.117	79.3364	122.7178	73.754	132.5571	194.7596	-9.9376	201.2079	393.3991	2473.8689
0.5355	71.1288	79.3634	122.7568	73.7529	132.5387	194.2998	-9.3852	200.3948	393.3216	2474.1494
0.5356	71.1408	79.3626	122.7138	73.7983	132.5233	195.7072	-9.851	200.2063	393.6538	2476.0169
0.5357	71.1398	79.344	122.621	73.8157	132.5031	195.4794	-9.9384	201.8721	393.0979	2475.154
0.5358	71.1551	79.3616	122.6332	73.7925	132.4853	195.9608	-9.7987	200.9602	392.3692	2475.023
0.5359	71.1645	79.3564	122.5608	73.803	132.4789	195.8748	-9.8386	200.4758	393.1297	2471.0295
0.536	71.1645	79.3637	122.5878	73.794	132.4724	195.5611	-9.8539	201.1474	393.3998	2475.614
0.5361	71.1599	79.369	122.6793	73.7784	132.5237	195.2065	-9.9536	200.8198	392.9949	2476.081
0.5362	71.144	79.3554	122.6045	73.7671	132.4843	194.3011	-9.4607	200.3733	392.4306	2473.8047
0.5364	71.1718	79.3661	122.6257	73.7986	132.534	193.4579	-9.5224	200.2991	393.1403	2473.3754
0.5364	71.1426	79.367	122.587	73.7759	132.5113	193.7229	-9.9701	201.7437	392.7679	2477.2832
0.5365	71.1462	79.3604	122.5933	73.767	132.5201	194.6417	-9.8128	200.0807	392.9008	2477.2832
0.5366	71.1541	79.3301	122.6037	73.7853	132.4982	194.5376	-9.8455	199.992	392.3138	2474.9749
0.5367	71.1349	79.3537	122.5832	73.8064	132.5039	192.6378	-9.5173	201.2005	393.2833	2475.4914
0.5367	71.1513	79.3724	122.5978	73.7651	132.4634	194.1128	-9.9356	200.5606	392.3564	2474.9777
0.5369	71.1281	79.3834	122.5656	73.7615	132.4599	193.6703	-9.6621	201.1368	393.188	2474.809
0.5371	71.1244	79.37	122.5746	73.8073	132.4783	194.5144	-10.0314	201.2606	391.9274	2473.1761
0.5372	71.1278	79.3685	122.5794	73.7879	132.4689	195.8552	-9.9747	201.6388	393.813	2475.4377
0.5372	71.1178	79.3627	122.5496	73.8065	132.4492	195.8985	-9.8249	200.5205	392.7457	2473.4921
0.5375	71.138	79.3675	122.6119	73.7733	132.4342	194.7773	-9.65	200.1177	393.0392	2475.3516
0.5376	71.1403	79.3931	122.6298	73.7759	132.4643	195.8259	-9.689	202.7452	394.3532	2474.4104
0.5377	71.134	79.3868	122.6398	73.7812	132.4648	194.9285	-9.8124	200.5571	392.8543	2476.1813
0.5378	71.1674	79.3861	122.6341	73.7974	132.4544	194.2665	-9.8008	201.5999	392.4677	2474.4564
0.5379	71.1617	79.3581	122.5945	73.7733	132.4318	194.0564	-9.7015	202.5604	392.1256	2475.7123
0.538	71.1635	79.3724	122.5522	73.8332	132.3847	195.1408	-9.7846	200.9742	393.188	2473.1301
0.5381	71.1396	79.3924	122.5994	73.8132	132.4199	194.5251	-9.7829	200.2036	392.3935	2476.419
0.5382	71.1547	79.388	122.5931	73.7994	132.4016	194.6032	-9.9798	201.6353	392.8967	2472.5858
0.5383	71.164	79.3632	122.5939	73.7807	132.4215	193.2731	-9.3157	200.4405	392.8278	2474.8934
0.5384	71.1641	79.3884	122.576	73.8004	132.3935	194.9937	-9.6805	201.5663	392.9894	2475.4157
0.5385	71.155	79.3688	122.5849	73.813	132.3697	194.7241	-10.069	201.2429	392.7113	2475.1924
0.5386	71.1367	79.3917	122.5728	73.7639	132.3679	194.3481	-9.4776	200.9935	392.0591	2474.0532
0.5387	71.1474	79.3744	122.4949	73.8501	132.3624	195.9589	-9.7606	200.4022	392.8232	2475.8405
0.5389	71.1245	79.354	122.5528	73.8021	132.3803	195.1219	-10.006	200.7496	391.8653	2473.5242
0.5389	71.1352	79.38	122.5451	73.8096	132.3776	195.9589	-9.8918	203.1222	391.8376	2474.9589
0.539	71.1366	79.3797	122.5486	73.8222	132.3787	196.2284	-9.4303	201.4232	392.0598	2475.0544
0.5391	71.1403	79.4029	122.5258	73.795	132.3261	195.2743	-9.6509	201.0268	392.6848	2474.2856
0.5392	71.1164	79.3887	122.5358	73.8213	132.3398	196.1751	-9.965	201.31	393.5799	2474.5484
0.5392	71.1362	79.389	122.5865	73.7951	132.3951	194.86	-9.7154	200.6773	393.0079	2476.2273
0.5393	71.1366	79.4016	122.5429	73.7993	132.3373	194.605	-9.4182	201.8721	392.7907	2473.5134
0.5394	71.122	79.3943	122.4889	73.8295	132.3098	195.9645	-9.625	200.4652	393.0979	2474.1421
0.5395	71.1425	79.3734	122.4999	73.8018	132.3588	195.6979	-10.0198	201.607	393.1774	2475.8057
0.5395	71.1602	79.3871	122.5081	73.7973	132.3408	195.4052	-9.8718	200.3948	392.3083	2473.7807
0.5397	71.1934	79.4252	122.5014	73.8236	132.354	195.2306	-9.68	201.5109	393.9695	2472.9872
0.5398	71.1515	79.409	122.4911	73.8105	132.3512	193.826	-9.5307	201.2781	393.2219	2474.2215
0.5399	71.1401	79.3856	122.4636	73.789	132.2988	193.1922	-9.7022	201.1934	393.1986	2475.1617
0.5399	71.1855	79.4123	122.5104	73.7895	132.3133	193.6505	-9.8158	201.6698	393.3991	2475.0871
0.54	71.1645	79.4002	122.4774	73.7934	132.2722	193.5388	-9.662	200.6384	391.705	2472.0568
0.5401	71.1611	79.3846	122.471	73.8284	132.2658	193.5014	-9.4073	200.6101	392.1922	2473.8661

0.5401	71.1633	79.4184	122.4392	73.83	132.3079	194.087	-9.7198	200.3521	392.992	2473.7587
0.5403	71.1674	79.3891	122.3905	73.8939	132.2485	195.4285	-9.5245	201.7733	392.4689	2474.3738
0.5404	71.1264	79.406	122.4894	73.808	132.3197	195.0271	-9.4893	199.334	394.3055	2474.4257
0.5405	71.1327	79.4099	122.428	73.8259	132.2681	195.179	-9.7778	200.5253	392.473	2474.9777
0.5406	71.1452	79.4153	122.4167	73.811	132.2374	194.781	-9.7946	200.2729	390.924	2473.2277
0.5407	71.1357	79.3885	122.4471	73.8064	132.2729	196.4186	-9.6801	200.5182	391.8162	2473.6744
0.5408	71.1434	79.4085	122.4064	73.8413	132.2569	195.9998	-9.6439	201.1081	392.563	2474.0612
0.5408	71.1305	79.398	122.43	73.823	132.2772	195.3932	-9.92	201.3525	392.7325	2473.0611
0.541	71.1347	79.4167	122.4061	73.8376	132.2344	195.0706	-9.5076	201.4055	392.8543	2475.108
0.541	71.156	79.4306	122.3881	73.8119	132.2237	195.9974	-10.0538	201.7767	392.8066	2472.5244
0.5411	71.147	79.3891	122.4128	73.8351	132.2111	195.4471	-9.8134	201.5811	392.3581	2476.9466
0.5414	71.1513	79.4163	122.3626	73.8322	132.1984	195.3421	-9.8727	200.5426	392.6294	2472.4582
0.5415	71.152	79.4024	122.328	73.8237	132.1971	194.2834	-9.7548	200.8576	392.6636	2475.591
0.5416	71.1757	79.4235	122.338	73.8266	132.1952	194.9134	-9.8968	201.158	392.3194	2472.5474
0.5418	71.1656	79.4077	122.3716	73.8312	132.1875	194.9705	-9.7237	201.4148	393.6206	2474.1173
0.5418	71.1648	79.4223	122.3866	73.8105	132.2127	194.7623	-9.797	200.953	392.4412	2475.8517
0.542	71.1386	79.4085	122.3619	73.7998	132.2142	195.5602	-9.7498	201.7625	392.4518	2472.4631
0.5421	71.1452	79.4051	122.367	73.8291	132.2003	195.4461	-9.4308	201.8841	392.6627	2474.3818
0.5422	71.1252	79.4121	122.3558	73.8	132.1906	194.6841	-9.7804	201.1722	392.8331	2474.8934
0.5425	71.1078	79.4338	122.3637	73.7895	132.1899	195.5673	-9.4568	201.9605	393.9348	2473.2757
0.5426	71.1396	79.4192	122.3631	73.8181	132.1726	194.8867	-9.7335	201.7802	392.9285	2473.7587
0.5427	71.1093	79.4109	122.3575	73.8173	132.1813	195.1808	-9.586	201.4514	393.3469	2472.7698
0.5428	71.124	79.4324	122.4185	73.8128	132.2068	194.6017	-9.6313	200.927	392.0203	2472.8509
0.543	71.1386	79.4377	122.3733	73.809	132.1971	194.2452	-9.6393	201.3242	392.5789	2476.948
0.5431	71.1694	79.4319	122.3306	73.797	132.1491	194.0239	-9.5028	201.9322	390.0546	2474.8066
0.5432	71.1703	79.4255	122.2765	73.8102	132.1387	193.8604	-9.8022	201.964	392.6371	2474.4641
0.5433	71.1725	79.4325	122.3206	73.8284	132.1564	193.6356	-9.5118	201.3772	392.5577	2473.8661
0.5434	71.162	79.4347	122.2592	73.8235	132.1029	193.8799	-9.3883	201.0637	392.6571	2474.494
0.5435	71.1899	79.4328	122.3029	73.8151	132.1388	193.72	-9.7917	200.801	393.1403	2474.3337
0.5436	71.163	79.4306	122.2385	73.8509	132.0723	194.9083	-9.7061	200.5131	392.5519	2473.7647
0.5437	71.173	79.4184	122.2494	73.8385	132.1022	195.7122	-9.6729	201.1439	392.849	2474.717
0.5439	71.1589	79.453	122.2896	73.7991	132.135	195.0546	-9.7368	202.3493	393.1562	2474.648
0.544	71.1413	79.4191	122.2533	73.8506	132.092	196.2014	-9.7864	201.0674	392.5907	2475.3596
0.5441	71.1516	79.4262	122.2493	73.8092	132.0783	196.2524	-9.827	201.2287	393.1933	2474.1574
0.5442	71.1435	79.4523	122.2298	73.8502	132.0898	196.3164	-9.9441	201.7554	391.7156	2475.0237
0.5442	71.1342	79.4114	122.2121	73.8785	132.0912	195.2164	-10.0233	201.8155	392.1552	2472.8158
0.5443	71.1567	79.4435	122.1358	73.8518	132.0556	196.2106	-9.3776	200.953	392.8119	2474.1957
0.5445	71.1418	79.4579	122.187	73.8139	132.1066	194.7463	-9.7251	201.5575	392.8914	2474.1191
0.5445	71.1409	79.4416	122.2377	73.8315	132.1	195.0093	-9.7982	201.9534	391.9327	2473.3141
0.5447	71.145	79.4489	122.2341	73.8375	132.1273	195.4127	-9.4159	202.2503	391.7261	2472.1718
0.5448	71.1426	79.4408	122.1327	73.8831	132.0192	195.1934	-9.5256	201.91	392.8343	2473.7566
0.5449	71.1539	79.4418	122.1744	73.8593	132.0408	194.6482	-9.4644	200.5611	393.2219	2473.5963
0.5451	71.176	79.4262	122.1388	73.8549	132.0444	194.8254	-9.4767	203.127	393.2304	2473.8201
0.5451	71.187	79.4567	122.1342	73.86	132.0327	194.9969	-9.7701	201.1439	391.3077	2477.6456
0.5453	71.1661	79.4489	122.1803	73.873	132.0616	196.389	-9.7264	201.5257	392.0757	2472.8269
0.5454	71.1677	79.4326	122.126	73.8784	132.0244	196.2977	-9.5391	201.9534	392.9602	2471.9418
0.5455	71.1602	79.4456	122.096	73.8557	132	196.2283	-9.6759	201.7252	392.4135	2475.3356
0.5457	71.1901	79.4525	122.1436	73.8279	132.035	195.0272	-9.7125	202.0578	393.3216	2474.0211
0.5458	71.1616	79.4679	122.0956	73.8351	132.0275	195.283	-9.315	202.4448	390.5927	2475.5987
0.5459	71.1765	79.4535	122.1118	73.8297	132.0175	196.2951	-9.9082	201.8721	393.1986	2473.5287
0.546	71.1728	79.4523	122.0714	73.8666	131.9725	195.9885	-9.7407	201.4656	393.1615	2476.189
0.5462	71.1792	79.4562	122.0727	73.8678	131.9951	194.7774	-9.3269	201.3348	390.4603	2475.0314
0.5462	71.1411	79.4717	122.07	73.8553	131.9996	195.1115	-9.7309	201.0697	391.9592	2474.556

0.5464	71.1403	79.4665	122.0969	73.8516	132.0755	194.0304	-9.6042	201.1561	392.5076	2476.8825
0.5466	71.1158	79.4598	122.087	73.8695	132.0433	195.4749	-9.5394	201.6328	392.0979	2473.0273
0.5467	71.1293	79.4722	122.1004	73.8693	132.0227	195.3123	-9.8492	200.6596	393.0926	2475.591
0.5468	71.133	79.4856	122.0557	73.8627	131.9925	194.7685	-9.4686	201.3666	391.1965	2477.638
0.5469	71.1457	79.452	122.0307	73.8932	131.9724	195.6162	-9.4976	201.8367	392.706	2473.7434
0.547	71.1528	79.498	122.0574	73.8741	132.0132	194.7978	-9.5458	200.8258	392.3988	2473.7837
0.5471	71.1457	79.4666	122.0323	73.9144	131.9882	196.2302	-9.8133	200.8399	392.4571	2474.0807
0.5472	71.147	79.4833	121.9739	73.9069	131.9579	197.3458	-9.7026	201.6661	392.5685	2472.8509
0.5473	71.163	79.4687	122.0178	73.8727	131.9917	195.7805	-9.4102	201.3852	391.9262	2471.5605
0.5474	71.1596	79.4781	122.0461	73.8919	132.0234	196.024	-9.7894	201.2712	393.1668	2474.993
0.5475	71.1745	79.4832	122.0137	73.8905	131.9626	195.6713	-9.7296	201.0414	392.3352	2476.925
0.5476	71.1953	79.4771	121.9929	73.8937	131.987	196.0827	-9.4937	201.5398	391.223	2474.5484
0.5477	71.162	79.4855	121.9951	73.8674	132.0164	194.9222	-9.7231	201.0379	392.048	2471.817
0.5478	71.2029	79.4805	122.0391	73.8869	132.018	194.729	-9.5965	201.9063	392.1256	2473.0032
0.5479	71.2002	79.4747	121.9695	73.8771	131.9851	195.2634	-9.8708	201.356	391.7209	2476.7563
0.548	71.1985	79.4705	122.0239	73.8424	131.9942	195.0946	-9.6794	201.204	391.599	2472.9614
0.5481	71.1587	79.4771	122.0035	73.876	131.9949	194.8479	-9.9699	202.3572	392.3194	2475.1833
0.5482	71.1408	79.4771	121.9965	73.8638	131.9681	195.4118	-9.9242	200.805	391.295	2474.502
0.5483	71.1773	79.4906	121.9793	73.8742	131.9683	194.664	-9.0544	201.8324	392.2917	2474.9108
0.5483	71.1582	79.4742	121.9919	73.8365	131.9813	194.9898	-9.8416	200.8682	392.0757	2473.8584
0.5484	71.1457	79.4593	122.0289	73.8524	131.9777	195.3301	-10.3236	201.2535	391.4931	2475.821
0.5485	71.1327	79.4665	121.9698	73.8697	131.9141	196.0527	-9.3508	202.2241	392.8952	2474.5662
0.5485	71.1503	79.4956	121.9657	73.8488	131.9148	196.1769	-9.6595	201.6671	391.3925	2473.4521
0.5486	71.1441	79.4703	122.0088	73.8764	131.9729	195.6551	-9.8667	201.5848	391.5441	2475.3516
0.5487	71.1347	79.5092	122.0039	73.8781	131.9838	196.4603	-9.6196	201.4055	392.2929	2474.6327
0.5489	71.1433	79.5129	121.9888	73.8968	131.9568	195.3034	-9.6838	201.4267	391.848	2475.154
0.549	71.1408	79.4721	122.0579	73.8219	131.9895	194.8182	-9.4543	202.0948	390.8797	2475.9848
0.5491	71.1641	79.4901	122.041	73.8735	131.9676	195.7016	-10.0837	201.5331	392.2418	2473.7727
0.5492	71.1428	79.4808	122.0407	73.8937	131.968	194.8423	-9.3674	201.105	392.6583	2475.2
0.5493	71.1679	79.4961	122.0994	73.8878	131.998	194.8156	-9.6113	201.8191	392.9549	2473.9734
0.5494	71.1794	79.485	122.0611	73.8915	132.0051	195.2743	-9.7711	202.5087	391.8487	2473.5803
0.5494	71.2029	79.4957	122.0527	73.8855	131.9842	194.637	-9.6743	202.0283	392.4523	2478.4214
0.5495	71.1928	79.4844	122.0089	73.9052	131.9222	195.3941	-10.0197	202.2751	393.2462	2471.9418
0.5496	71.1616	79.4825	121.9874	73.932	131.9198	194.2229	-9.2877	202.2503	392.6266	2469.2662
0.5497	71.165	79.4907	121.8878	73.9498	131.9062	195.0937	-9.3844	201.2217	391.0959	2434.8129
0.5497	71.1887	79.4973	121.8792	73.9288	131.8715	196.1671	-9.4786	201.4903	391.9857	2379.3688
0.5499	71.1802	79.4756	121.8071	74.0324	131.8565	195.8511	-9.7073	201.6033	392.3858	2223.5211
0.55	71.1643	79.49	121.851	73.9903	131.8672	196.3999	-9.895	201.8014	392.2081	2210.4759
0.5502	71.1618	79.4853	121.7772	74.0402	131.7845	196.1558	-9.7825	201.7696	390.9018	2125.2976
0.5503	71.1628	79.5143	121.7489	74.0699	131.7588	196.8878	-10.014	202.372	392.8288	2081.1672
0.5504	71.1389	79.4988	121.7406	74.0825	131.7858	197.2742	-10.2886	201.8226	392.0704	2077.9222
0.5505	71.1042	79.4837	121.7371	74.0593	131.7537	197.3969	-10.322	202.0771	392.9708	2048.4752
0.5506	71.1314	79.3889	126.7932	71.6281	132.8482	197.0941	-10.9209	202.5013	393.0281	1966.8818
0.5507	71.1355	79.3726	127.6828	71.2348	133.0024	197.395	-10.2355	200.9787	391.9317	1917.3733
0.5508	71.1457	79.3574	127.637	71.2952	132.9766	197.8865	-10.089	199.4561	391.9096	1845.3027
0.5508	71.1467	79.38	127.7545	71.2454	133.0341	197.3835	-10.3306	201.2146	391.938	1824.6826
0.5509	71.1516	79.3849	127.7319	71.2125	133.0234	197.029	-10.1483	201.7554	392.0863	1822.03
0.551	71.167	79.3686	127.7319	71.2344	133.0471	196.6682	-10.1167	201.3666	392.0598	1770.9482
0.5511	71.1587	79.3652	127.7137	71.2665	133.0009	197.1349	-10.5767	201.862	391.7435	1736.9965
0.5512	71.1692	79.383	127.624	71.307	132.9847	197.3533	-11.1697	200.9919	391.4772	1731.3431
0.5513	71.1687	79.3802	127.682	71.2443	133.0066	196.6017	-11.7943	202.7341	391.9428	1686.422
0.5514	71.175	79.3669	127.6118	71.3288	132.9725	197.5684	-12.4626	201.858	393.5058	1658.7722
0.5515	71.1865	79.3904	127.5848	71.3106	133.014	196.6584	-12.3195	202.6639	392.2584	1651.6531

0.5516	71.1505	79.38	127.5504	71.3648	132.9151	196.9696	-12.3381	201.437	392.0591	1645.161
0.5517	71.134	79.3747	127.5201	71.3593	132.919	197.8482	-12.732	201.0591	392.4571	1604.6008
0.5517	71.132	79.3581	127.5699	71.3737	132.9402	198.0331	-12.5805	202.0382	392.5683	1598.8816
0.5518	71.1388	79.3734	127.4105	71.4333	132.8575	197.435	-12.3831	201.6328	391.5275	1597.2315
0.5519	71.1153	79.3958	127.4834	71.3931	132.9402	197.6552	-12.6371	202.0209	392.192	1565.3159
0.5522	71.1296	79.3668	127.5286	71.4113	132.8659	197.9441	-12.8223	201.8952	392.5851	1565.0354
0.5523	71.1447	79.3716	127.478	71.385	132.895	197.8205	-12.8688	201.6476	392.2141	1562.8634
0.5524	71.142	79.3754	127.3661	71.4848	132.7939	198.0037	-12.9595	201.5999	391.2389	1522.6154
0.5525	71.1577	79.3861	127.4202	71.4377	132.8646	197.4244	-12.9848	202.4624	393.1191	1516.1755
0.5526	71.1579	79.3742	127.4071	71.3998	132.8349	197.4911	-13.0101	201.6671	392.1552	1513.9829
0.5528	71.1565	79.492	121.3993	74.2437	131.5102	198.1024	-13.1767	201.7837	391.7473	1514.6115
0.5531	71.1618	79.4924	121.3112	74.3074	131.47	197.6919	-13.1848	202.268	391.0694	1513.1856
0.5533	71.1194	79.5168	121.3158	74.2958	131.4419	197.9914	-12.9243	201.9359	392.635	1515.3266
0.5534	71.1273	79.5069	121.2884	74.3035	131.4544	197.9357	-12.6511	200.9566	392.4965	1512.305
0.5536	71.1426	79.4942	121.2586	74.2757	131.4496	198.3342	-12.4649	201.0859	391.8708	1512.4252
0.5537	71.1557	79.4912	121.2615	74.2884	131.4371	198.1042	-12.4083	200.8293	391.3872	1513.7759
0.5539	71.1194	79.5224	121.2372	74.2869	131.4308	197.9626	-12.3515	201.315	393.4323	1513.2748
0.5539	71.1804	79.5191	121.2234	74.3341	131.3872	197.8066	-12.3703	201.3224	392.5575	1513.6755
0.5541	71.187	79.4956	121.2354	74.313	131.4041	198.1406	-12.3787	202.0665	391.4878	1513.4232
0.5543	71.1555	79.508	121.2185	74.3397	131.3801	198.1237	-12.5165	202.2397	392.2134	1513.9369
0.5545	71.1555	79.5104	121.2209	74.3153	131.3492	198.3227	-12.6025	201.3772	391.4666	1512.5723
0.5547	71.153	79.5275	121.2276	74.3074	131.3749	198.1113	-12.2349	201.2075	391.1594	1512.8176
0.5548	71.1444	79.5291	121.2159	74.2908	131.3898	197.8892	-12.3844	202.6196	392.8509	1514.437
0.5549	71.1423	79.5168	121.2064	74.3151	131.3704	197.7239	-12.4694	201.455	391.6732	1513.4462
0.5551	71.1942	79.5227	121.2002	74.3308	131.3791	198.1856	-12.4111	202.5198	391.2839	1514.3568
0.5552	71.176	79.5114	121.1366	74.3023	131.3128	198.0979	-12.4475	201.2924	391.8321	1512.0663
0.5553	71.2021	79.5179	121.1477	74.341	131.3044	197.919	-12.4717	201.5294	391.4722	1514.1484
0.5553	71.1614	79.492	121.1404	74.3306	131.3047	198.2828	-12.5417	201.6635	393.956	1514.0902
0.5554	71.1809	79.526	121.155	74.3065	131.3097	197.9487	-12.539	202.215	391.7685	1511.6753
0.5555	71.1692	79.5095	121.1774	74.2928	131.3202	198.0331	-12.4149	201.303	390.3438	1513.1856
0.5556	71.1582	79.5072	121.1325	74.305	131.2818	198.2775	-12.5342	201.2116	391.522	1514.485
0.5557	71.15	79.5118	121.124	74.2963	131.2833	198.0667	-12.5112	200.8309	391.9317	1514.6453
0.5558	71.1434	79.5255	121.1459	74.278	131.2877	197.9357	-12.7262	201.9728	391.9262	1513.4271
0.556	71.1504	79.5248	121.1189	74.3477	131.2643	198.0944	-12.7779	202.2751	390.8681	1512.8942
0.5561	71.1406	79.538	121.1006	74.3081	131.2575	198.4234	-12.6852	201.2965	391.5497	1511.792
0.5562	71.145	79.5219	121.0909	74.3216	131.2673	198.1157	-12.7921	201.9216	391.4878	1515.0715
0.5565	71.1709	79.5428	121.1518	74.3105	131.2946	198.034	-12.7735	201.7166	390.831	1513.6839
0.5568	71.183	79.5013	121.0993	74.3017	131.2437	198.1503	-12.6779	201.3668	391.7269	1513.3389
0.5569	71.1891	79.5227	121.0568	74.3196	131.2214	198.2618	-12.7018	201.7068	391.893	1513.8839
0.557	71.1433	79.5469	121.0785	74.3162	131.2335	198.4151	-12.4598	202.1478	392.1022	1513.3082
0.5572	71.1443	79.5479	121.0642	74.3284	131.2074	198.2934	-12.1149	202.2221	392.0969	1511.8133
0.5574	71.1592	79.5238	120.9813	74.3437	131.1486	198.0055	-12.5489	201.2853	391.1965	1513.6916
0.5574	71.1506	79.5504	121.0736	74.3188	131.2082	198.4336	-12.9699	201.7622	391.4888	1514.7495
0.5576	71.1582	79.5496	121.0501	74.3408	131.1838	198.305	-12.805	201.0591	390.9952	1512.6106
0.5576	71.1804	79.542	120.9847	74.3581	131.1744	198.0416	-12.7396	202.0763	391.2008	1514.5572
0.5579	71.1865	79.5268	120.9982	74.2928	131.1798	198.1432	-12.9203	201.554	392.6954	1512.1199
0.558	71.1786	79.525	121.0246	74.3224	131.1719	198.0834	-12.7152	201.9026	391.6826	1516.048
0.5581	71.1968	79.5329	120.9894	74.3272	131.1915	198.18	-12.7821	201.91	390.0048	1512.3771
0.5582	71.1611	79.5452	120.9449	74.3408	131.1458	198.4045	-12.9027	201.8686	391.3554	1512.7026
0.5583	71.1965	79.5403	120.9639	74.3369	131.1736	198.2478	-12.9208	201.777	391.5275	1512.7538
0.5586	71.21	79.5647	120.9452	74.3362	131.1555	198.4498	-12.7589	201.9711	391.4507	1512.5033
0.5589	71.1604	79.525	120.941	74.3295	131.1419	198.0846	-12.7786	201.2853	391.562	1515.6005
0.559	71.16	79.5446	120.9537	74.3239	131.1261	198.3621	-12.8694	202.8857	391.4943	1514.1484

0.5591	71.1333	79.5637	120.905	74.3367	131.087	198.3592	-12.6862	201.6671	390.7993	1513.5459
0.5592	71.1567	79.5555	120.8728	74.3671	131.0573	198.1779	-12.184	201.6772	391.4454	1512.5723
0.5593	71.1521	79.5443	120.9094	74.3425	131.092	198.3621	-12.1668	201.4074	390.8409	1513.2988
0.5594	71.1445	79.553	120.9148	74.3101	131.0539	198.0793	-12.3269	202.3847	392.3352	1514.9642
0.5594	71.149	79.5616	120.8754	74.3562	131.0681	198.1624	-12.5467	200.9972	391.7712	1513.1626
0.5595	71.1682	79.5547	120.8639	74.3337	131.0746	198.1539	-12.6408	201.3701	392.2558	1513.3159
0.5596	71.1789	79.5484	120.8673	74.3347	131.0637	197.9762	-12.6593	201.8792	391.1118	1515.9685
0.5597	71.1611	79.555	120.8778	74.3284	131.0741	197.8491	-12.6164	201.409	391.7156	1514.0902
0.5598	71.1858	79.5397	120.8727	74.3407	131.0231	198.1661	-12.5674	201.3779	390.6416	1512.1928
0.5599	71.1858	79.5795	120.8878	74.3523	131.1103	198.2188	-12.5598	201.5858	391.509	1517.5708
0.56	71.1794	79.5732	120.8685	74.3506	131.0721	198.2463	-12.4877	201.3136	389.2262	1513.9676
0.5601	71.186	79.5603	120.8581	74.3229	131.0474	198.209	-12.6408	201.6459	391.4295	1512.6183
0.5602	71.2009	79.5606	120.863	74.3474	131.0808	197.9709	-12.7603	202.6356	391.1435	1512.4113
0.5603	71.1889	79.5784	120.8083	74.3463	131.0237	198.2237	-12.5814	201.7511	392.2861	1512.1447
0.5605	71.1868	79.5586	120.8165	74.3496	131.0294	197.9914	-12.7371	202.1687	391.6715	1513.8438
0.5606	71.1713	79.5685	120.828	74.3665	131.0433	198.2181	-12.874	201.7659	390.7523	1517.0498
0.5607	71.1826	79.5715	120.7803	74.3288	131.0532	197.8785	-13.1157	201.1651	391.7314	1513.9676
0.5608	71.1794	79.5741	120.8372	74.3478	131.0649	198.0797	-13.0263	201.5515	391.3669	1514.1244
0.561	71.1538	79.5671	120.7555	74.3523	130.9976	198.3485	-12.7703	201.7166	391.313	1512.7563
0.5611	71.1695	79.5769	120.8045	74.368	131.0075	198.324	-12.6626	202.3461	390.9129	1515.8235
0.5614	71.1704	79.5642	120.7657	74.3359	130.9602	198.1353	-13.028	201.3843	391.0906	1510.74
0.5615	71.1768	79.5657	120.7299	74.3628	130.9768	198.1104	-12.4754	201.1086	391.6838	1512.2809
0.5616	71.1789	79.5787	120.7768	74.3423	130.9699	198.4884	-12.8405	201.3889	391.4666	1512.7218
0.5618	71.1605	79.5832	120.7646	74.3629	130.9951	198.2775	-13.1663	201.5996	390.5807	1514.1965
0.5619	71.1777	79.5837	120.7301	74.3703	130.9795	198.0944	-13.001	202.2503	391.6255	1515.6542
0.562	71.1736	79.5844	120.7614	74.3364	130.9511	198.2756	-13.2253	203.3179	390.7463	1515.9455
0.5621	71.1907	79.5844	120.7234	74.361	130.9704	197.8074	-13.1897	200.5748	392.1499	1511.3686
0.5622	71.1981	79.5698	120.6914	74.3851	130.9595	198.1846	-13.2211	202.1428	391.6383	1513.6194
0.5622	71.1711	79.582	120.7119	74.3762	130.94	198.2428	-13.3267	201.9181	391.8003	1515.2479
0.5624	71.2041	79.5832	120.6907	74.3862	130.9307	198.3609	-13.2412	201.8367	391.3448	1514.3509
0.5625	71.2065	79.5705	120.7191	74.3751	130.9523	198.3073	-12.5781	202.7711	391.5608	1512.5615
0.5626	71.1941	79.5708	120.6835	74.3959	130.9164	198.1397	-12.5397	202.3422	390.7304	1513.7376
0.5627	71.196	79.6044	120.7289	74.3666	130.876	198.0748	-12.8317	201.9357	391.1647	1511.9129
0.5628	71.1975	79.5921	120.7214	74.3596	130.8998	198.089	-12.7598	201.6772	391.4555	1515.9919
0.563	71.1925	79.5896	120.6799	74.3937	130.9281	197.9961	-12.9368	201.9765	391.2562	1514.5492
0.5631	71.1881	79.5802	120.7238	74.3902	130.8849	198.4336	-13.0631	200.8161	391.9484	1513.5473
0.5632	71.1836	79.5774	120.6943	74.3703	130.8938	198.0393	-13.0013	201.7696	390.9899	1511.6753
0.5635	71.165	79.6002	120.6823	74.4117	130.8652	198.2214	-13.1228	202.1443	391.0694	1513.0169
0.5636	71.1562	79.5866	120.6734	74.3642	130.8446	198.0574	-13.1781	202.723	391.8708	1513.8759
0.5638	71.167	79.607	120.6613	74.3879	130.811	198.281	-13.136	201.5822	390.2114	1512.2273
0.5639	71.1392	79.5866	120.6577	74.3915	130.8384	197.8634	-12.9212	201.6105	392.4888	1515.0562
0.564	71.1593	79.6074	120.6539	74.3774	130.8152	198.0174	-12.9688	201.9839	391.3669	1514.7736
0.5642	71.1533	79.6177	120.668	74.402	130.8438	198.1903	-13.2623	202.3387	390.4391	1512.1199
0.5643	71.1792	79.6094	120.6451	74.4296	130.8015	198.0732	-13.1845	202.457	392.1256	1512.5294
0.5644	71.1753	79.5861	120.6587	74.3998	130.8179	198.3974	-13.3288	201.0096	391.0164	1511.9283
0.5644	71.1498	79.5929	120.6369	74.4264	130.7859	198.3258	-13.3946	201.6772	390.8188	1513.7958
0.5645	71.2009	79.6068	120.6018	74.4149	130.797	198.0411	-13.1539	201.9569	390.7728	1513.4692
0.5647	71.1655	79.6032	120.6775	74.3996	130.7844	198.1424	-13.4385	201.7908	391.3607	1514.7265
0.5648	71.2024	79.6122	120.6591	74.3751	130.8329	197.9255	-12.987	201.5848	391.4832	1514.5171
0.5649	71.1871	79.597	120.6941	74.3547	130.808	198.2385	-13.4117	201.5109	391.4334	1512.5294
0.565	71.1827	79.6181	120.615	74.3734	130.7939	198.2134	-13.1079	201.4555	391.0735	1512.6416
0.5653	71.1886	79.6239	120.5805	74.407	130.7545	198.0109	-13.3477	200.6166	391.1178	1511.5275
0.5655	71.1709	79.6256	120.5516	74.4173	130.747	197.9362	-13.2453	202.0983	391.4878	1512.6106

0.5658	71.1682	79.6112	120.5709	74.433	130.7326	198.1215	-13.26	202.2574	390.6693	1515.1904
0.566	71.1597	79.629	120.5645	74.4329	130.7265	198.0651	-13.4641	202.6957	389.9359	1514.9795
0.5661	71.1771	79.6227	120.5682	74.4098	130.7199	198.0555	-13.759	202.5309	391.5608	1514.4049
0.5663	71.1797	79.6049	120.5622	74.4139	130.7364	198.3649	-12.9144	200.7939	390.6416	1511.1669
0.5664	71.1848	79.643	120.5262	74.395	130.6956	198.0983	-12.6338	202.3202	390.3093	1514.0522
0.5666	71.1924	79.6178	120.5501	74.411	130.698	198.2028	-13.0549	200.4546	391.6149	1512.7179
0.5666	71.2131	79.6077	120.4992	74.4541	130.6886	197.9673	-13.0283	201.3963	390.0546	1514.5412
0.5667	71.2073	79.5961	120.5509	74.4239	130.6821	198.1264	-12.6172	201.8403	390.8099	1514.9029
0.5668	71.1851	79.6275	120.4911	74.4458	130.6772	197.9718	-12.9038	201.7661	390.7145	1513.8372
0.5669	71.1838	79.6293	120.5102	74.4195	130.6871	198.2311	-12.8587	201.8583	391.7656	1514.2125
0.567	71.1865	79.6168	120.5385	74.4113	130.7078	198.0615	-12.702	201.911	391.0535	1511.6446
0.5671	71.1751	79.6102	120.4754	74.4542	130.6759	198.1895	-12.4649	200.6844	390.651	1513.6379
0.5672	71.1643	79.6165	120.4811	74.4283	130.6697	197.8749	-11.8489	202.3246	391.0217	1513.7836
0.5674	71.1606	79.6032	120.4732	74.43	130.638	198.0571	-11.7175	201.8438	390.3173	1513.3082
0.5675	71.1628	79.6364	120.5119	74.4238	130.6888	197.5836	-11.9208	200.3616	390.6914	1512.0886
0.5676	71.1619	79.6238	120.5036	74.4464	130.6873	198.185	-11.9723	202.9114	391.1541	1512.1199
0.5677	71.1592	79.6431	120.44	74.4717	130.6454	197.9993	-11.9966	202.6957	391.0747	1512.7333
0.5678	71.1445	79.6334	120.4702	74.4092	130.692	197.9821	-11.9873	201.1968	388.6094	1512.8981
0.5678	71.1646	79.6435	120.6142	74.3739	130.7498	197.7727	-12.3334	201.9923	390.1213	1513.0782
0.568	71.177	79.6292	120.4617	74.4329	130.6575	198.1504	-11.9519	201.0449	390.7728	1513.2316
0.5681	71.1896	79.6479	120.4987	74.4205	130.7154	197.9561	-12.0005	202.3091	390.8022	1512.5695
0.5683	71.2083	79.6232	120.4733	74.4225	130.6901	198.0592	-11.9414	201.6255	390.5253	1513.7637
0.5686	71.1902	79.6496	120.4541	74.4422	130.6452	197.9415	-11.8612	202.0206	391.0164	1513.9599
0.5687	71.2012	79.6533	120.45	74.4429	130.6459	197.9362	-12.2121	201.5787	390.8099	1512.0356
0.5689	71.1694	79.646	120.4552	74.4361	130.6582	197.9904	-12.499	201.1757	390.4815	1514.8262
0.569	71.1841	79.6314	120.4646	74.4163	130.6603	198.1726	-12.5476	201.2924	389.9518	1512.0356
0.5692	71.1736	79.6547	120.466	74.4304	130.6754	198.2441	-12.0584	201.8102	390.5917	1512.4252
0.5693	71.1876	79.6178	120.4143	74.4745	130.6314	197.9078	-12.3348	201.5146	390.5807	1511.6317
0.5694	71.1866	79.6387	120.4151	74.4463	130.6277	198.0011	-12.6884	201.7661	391.0164	1513.7989
0.5696	71.1673	79.6341	120.3922	74.4108	130.6692	197.8083	-12.3852	202.2609	390.884	1513.6072
0.5697	71.1593	79.6608	120.39	74.4294	130.6246	198.1094	-12.258	201.4259	390.8575	1512.5134
0.5697	71.1657	79.6621	120.3848	74.424	130.6169	198.128	-12.3089	201.3224	391.3116	1513.4511
0.5699	71.181	79.6494	120.42	74.4166	130.6222	198.2868	-12.5296	202.0394	390.265	1513.9881
0.5701	71.2006	79.6512	120.3763	74.4383	130.601	198.2088	-12.5507	201.6883	390.3093	1513.9721
0.5703	71.2144	79.6624	120.3591	74.4355	130.6112	198.2302	-12.0542	201.4074	390.4312	1512.4412
0.5704	71.1946	79.6589	120.422	74.4193	130.618	197.8865	-12.3756	202.1832	390.3226	1514.4122
0.5705	71.22	79.6578	120.366	74.41	130.5684	198.3008	-12.3686	201.4481	390.9129	1514.0442
0.5707	71.2107	79.6603	120.3647	74.4168	130.5918	197.6537	-12.3701	201.0732	390.8893	1511.5756
0.5708	71.2019	79.6474	120.3583	74.4608	130.5781	197.8289	-12.3971	201.5257	389.7999	1511.5436
0.571	71.1868	79.6657	120.3191	74.4776	130.5416	198.2161	-12.7007	200.5854	390.6086	1513.0782
0.5711	71.1626	79.6819	120.347	74.4467	130.5744	198.089	-12.9526	200.9196	391.0347	1513.3068
0.5712	71.1629	79.6662	120.3595	74.4213	130.6009	198.0579	-12.8377	201.7661	391.2177	1514.4582
0.5714	71.1604	79.6638	120.3317	74.4222	130.5638	198.1575	-12.4121	202.8301	391.6149	1513.9062
0.5715	71.18	79.6611	120.3368	74.4413	130.5268	197.7583	-12.418	201.6181	390.4256	1513.94
0.5715	71.1934	79.6504	120.326	74.4359	130.5414	197.7381	-12.5682	201.7908	391.0853	1511.6293
0.5717	71.1948	79.6809	120.3651	74.4575	130.5401	198.0741	-12.6327	202.0874	392.3138	1514.6293
0.5717	71.2012	79.6898	120.3578	74.4415	130.5255	198.0242	-12.4369	201.0803	390.5185	1513.5689
0.5719	71.212	79.6713	120.3009	74.459	130.5093	198.1895	-12.1265	202.0488	390.5238	1510.9316
0.572	71.1909	79.6917	120.2809	74.4313	130.4822	197.8065	-12.5466	202.0312	390.4391	1510.142
0.5722	71.2154	79.6736	120.2973	74.4674	130.495	197.9989	-12.3859	201.6292	390.0989	1513.3549
0.5723	71.2022	79.6578	120.3023	74.4597	130.4851	197.7824	-12.1689	202.5531	390.7855	1512.6416
0.5724	71.1885	79.6796	120.3133	74.4595	130.4907	198.0348	-12.097	201.9499	390.9846	1513.8986
0.5724	71.2383	79.6586	120.3506	74.4415	130.5017	197.8243	-12.261	202.3564	391.17	1514.9259

0.5726	71.2119	79.6762	120.3066	74.4283	130.4936	197.7647	-12.3856	201.8898	391.0323	1513.9062
0.5728	71.1978	79.6662	120.2713	74.4536	130.5114	197.9506	-12.0841	201.352	391.3614	1515.6392
0.5729	71.1805	79.6788	120.2366	74.4446	130.4929	197.8607	-12.265	202.2221	390.1001	1515.1405
0.573	71.1858	79.6797	120.2818	74.4567	130.5144	198.2088	-12.0852	202.8191	390.625	1515.8556
0.5731	71.1922	79.6886	120.2664	74.4511	130.5438	198.0704	-12.1132	202.1059	390.6859	1516.7773
0.5733	71.1738	79.6957	120.2918	74.4592	130.5219	197.7323	-12.1044	201.4629	388.9361	1512.7779
0.5734	71.1537	79.6858	120.2588	74.474	130.4741	197.5483	-12.2637	201.1857	391.0901	1514.0522
0.5735	71.18	79.6784	120.2985	74.5005	130.4973	198.0304	-12.3056	202.1973	390.8999	1514.1669
0.5737	71.187	79.6781	120.309	74.4624	130.5031	197.9131	-12.3917	201.0308	390.8469	1513.5919
0.5738	71.2088	79.672	120.2946	74.4697	130.4674	198.0537	-12.7858	200.9492	390.5751	1512.3931
0.5739	71.1685	79.6878	120.2808	74.4556	130.496	198.0035	-13.1873	201.8731	390.3869	1514.2125
0.574	71.1958	79.7015	120.2564	74.4746	130.5007	197.8776	-12.4668	201.6847	389.0991	1513.3926
0.5741	71.2137	79.6921	120.2611	74.4406	130.4664	197.8521	-12.6488	202.0911	389.8331	1513.5473
0.5742	71.2137	79.69	120.2899	74.4478	130.4555	197.8047	-12.5686	201.607	390.4974	1513.5536
0.5743	71.241	79.6939	120.2353	74.4602	130.4134	197.9431	-12.2584	202.1798	390.1543	1513.6114
0.5744	71.2029	79.7085	120.2192	74.4561	130.4874	198.0659	-12.1191	201.4302	391.2389	1514.6192
0.5745	71.1995	79.7051	120.217	74.4661	130.4353	198.0979	-12.4888	202.0347	390.5927	1512.8636
0.5747	71.2036	79.6752	120.2378	74.4288	130.475	197.8216	-12.2226	202.2115	389.597	1512.0126
0.5748	71.1902	79.6886	120.2124	74.4614	130.4069	197.7763	-11.9266	200.9813	390.3226	1511.9973
0.5749	71.1973	79.6883	120.1859	74.4588	130.4091	197.9966	-11.7519	201.7378	390.0101	1512.2196
0.575	71.2091	79.6876	120.2441	74.4564	130.452	197.6366	-11.7587	201.0526	388.5574	1512.321
0.5751	71.1973	79.681	120.1931	74.4514	130.4162	198.0189	-12.3851	200.9459	390.3226	1513.5152
0.5751	71.1978	79.6942	120.2072	74.4799	130.3804	197.8326	-12.8964	200.975	390.0768	1513.5874
0.5753	71.1787	79.682	120.1606	74.5012	130.3744	197.7541	-11.8059	202.3599	390.2378	1513.5766
0.5753	71.1998	79.6981	120.1926	74.4997	130.3681	197.7034	-11.4809	202.2503	390.2908	1513.6916
0.5755	71.1912	79.6926	120.2201	74.5033	130.3311	197.9264	-11.9241	200.9122	392.0536	1515.4308
0.5756	71.1639	79.7137	120.1978	74.4933	130.3985	198.0825	-12.2095	200.9639	391.45	1513.2107
0.5756	71.2012	79.7068	120.243	74.4707	130.3898	197.7016	-12.5485	201.9781	389.7188	1513.7836
0.5757	71.1746	79.7144	120.1802	74.4602	130.3701	198.0411	-12.9043	201.1086	389.5705	1514.3969
0.5758	71.1973	79.6981	120.1622	74.4736	130.3474	197.8705	-12.8992	202.0594	390.9899	1511.6906
0.5758	71.183	79.7125	120.1714	74.451	130.3995	198.0156	-12.8253	200.7089	390.4921	1513.7397
0.5759	71.1954	79.6864	120.2017	74.4846	130.3891	197.7167	-12.2919	202.6922	390.1955	1514.2206
0.576	71.2086	79.7125	120.1921	74.4875	130.358	197.5483	-12.4734	200.9824	389.966	1514.3167
0.5761	71.1641	79.7242	120.2046	74.4671	130.4077	198.0026	-11.9081	202.9263	390.7136	1512.5454
0.5762	71.1929	79.7034	120.2115	74.4629	130.4107	197.9442	-11.998	200.1082	389.9783	1513.0169
0.5763	71.1795	79.7064	120.1207	74.463	130.349	197.8632	-12.2477	200.89	390.4145	1514.8217
0.5764	71.1936	79.7236	120.2236	74.4363	130.3872	197.9016	-12.7053	202.1796	390.0472	1514.6115
0.5766	71.1846	79.6886	120.1669	74.4668	130.3875	198.1689	-12.4941	201.3446	390.5917	1513.7076
0.5768	71.1827	79.7297	120.0996	74.5195	130.3184	197.8642	-11.9026	201.257	389.8777	1512.0663
0.5768	71.1927	79.7348	120.1347	74.487	130.3796	197.8696	-12.1711	200.6243	390.5927	1512.6643
0.577	71.2137	79.6974	120.1259	74.495	130.3398	197.5826	-12.3444	201.2323	389.7559	1513.1319
0.5773	71.2166	79.7197	120.1426	74.4804	130.3921	197.8145	-12.2875	202.0206	390.9105	1514.8415
0.5774	71.21	79.7277	120.1192	74.4809	130.3808	197.9824	-12.2778	200.5783	391.509	1515.0179
0.5774	71.242	79.7207	120.1747	74.4473	130.4026	197.8083	-12.3163	201.8756	391.2548	1512.4113
0.5776	71.2247	79.7336	120.1503	74.478	130.3387	197.736	-12.3297	201.2855	390.0989	1512.1046
0.5778	71.233	79.7312	120.1393	74.46	130.3341	197.7398	-12.2086	201.9181	390.4868	1512.3883
0.5779	71.221	79.7363	120.1551	74.5078	130.3332	197.9522	-12.465	200.9389	389.8989	1514.1286
0.578	71.1978	79.7171	120.1781	74.4706	130.3315	197.6366	-12.3943	202.2315	390.0325	1514.5892
0.5782	71.2198	79.7326	120.1221	74.4912	130.2884	197.7247	-12.3921	201.0449	389.4751	1513.0629
0.5785	71.2274	79.7353	120.1226	74.4941	130.2437	197.6892	-12.4578	201.3419	391.2865	1513.6609
0.5786	71.1883	79.7329	120.1216	74.4785	130.2665	197.8243	-12.4863	201.5292	390.116	1512.5723
0.5787	71.1851	79.74	120.1251	74.4905	130.2639	197.9468	-11.8671	201.8472	389.9771	1513.2027
0.5789	71.1802	79.7453	120.1049	74.4495	130.3085	198.0871	-12.4046	202.1096	390.4976	1514.2767

0.579	71.2061	79.719	120.1041	74.4802	130.2896	197.9202	-12.5422	200.8929	390.2061	1515.6925
0.5791	71.2127	79.7242	120.1274	74.4749	130.3034	197.6635	-12.179	202.6454	390.5807	1512.0725
0.5791	71.2047	79.7392	120.1341	74.4436	130.238	197.9636	-11.9516	201.9655	390.4533	1512.1447
0.5792	71.1954	79.7521	120.0879	74.5026	130.2163	197.8482	-11.9208	201.31	389.258	1516.2598
0.5793	71.1941	79.7411	120.1077	74.4668	130.2218	197.7274	-12.3738	202.162	390.8363	1515.6925
0.5795	71.1825	79.7374	120.0722	74.4773	130.2112	197.7926	-12.2909	201.1266	389.6172	1510.8703
0.5796	71.1961	79.728	120.1029	74.4857	130.2392	197.7852	-12.5158	202.5494	390.0934	1512.1046
0.5797	71.2045	79.7186	120.0349	74.4826	130.2238	197.722	-12.3813	201.8583	388.8697	1513.2187
0.5798	71.1981	79.7377	120.0281	74.5221	130.1687	198.0251	-12.3517	200.9141	390.7728	1513.4462
0.5799	71.189	79.7263	120.102	74.4853	130.1637	198.0144	-12.6331	201.6989	390.7516	1511.1616
0.5799	71.191	79.7501	120.0668	74.5202	130.1478	197.7647	-12.1681	201.7201	390.1319	1514.0136
0.5801	71.2073	79.747	120.0774	74.5187	130.1725	197.7932	-11.8906	201.2217	390.0207	1512.9096
0.5802	71.1832	79.7351	120.0609	74.5141	130.1776	197.7087	-12.5893	200.6773	389.9889	1512.6029
0.5803	71.1912	79.748	119.9911	74.5185	130.2341	197.4422	-12.509	201.6282	391.4507	1513.7989
0.5803	71.2032	79.7224	120.0335	74.5092	130.1651	197.5028	-12.0779	201.0268	389.1742	1514.6053
0.5805	71.2157	79.7552	120.0816	74.4997	130.141	197.9849	-12.0908	201.6809	389.5452	1514.0683
0.5806	71.2042	79.7171	120.047	74.5243	130.1709	197.5168	-12.3151	201.7095	390.2696	1513.9906
0.5807	71.2159	79.7628	120.1166	74.4977	130.1402	197.747	-12.4445	201.4126	388.8131	1517.0495
0.5808	71.2171	79.7421	120.1681	74.5016	130.1273	197.7754	-12.2378	201.006	390.6616	1511.5756
0.5808	71.2196	79.7412	120.1071	74.5002	130.1216	197.5938	-12.1773	201.3963	389.2739	1514.4289
0.5809	71.2159	79.736	120.0786	74.5199	130.1237	197.6474	-11.9382	201.2606	388.9879	1513.1089
0.581	71.213	79.7453	120.0663	74.4928	130.1473	197.3693	-12.1432	200.9353	390.8099	1512.4573
0.5811	71.2139	79.7611	120.0919	74.505	130.0467	197.631	-12.4566	201.655	390.1266	1515.5751
0.5814	71.2015	79.7436	120.1536	74.5136	129.9938	197.7976	-11.7844	201.8404	391.1806	1514.7112
0.5814	71.2024	79.7275	120.1175	74.5012	130.0388	197.6936	-12.0875	201.2747	389.7717	1514.9182
0.5815	71.2042	79.7487	120.0647	74.5058	130.0861	197.7105	-12.5657	201.0202	389.7241	1510.5253
0.5817	71.1869	79.7443	119.9674	74.5336	130.1193	197.5883	-12.2438	200.7533	390.254	1515.5991
0.5818	71.1907	79.7669	119.9447	74.537	130.069	197.4759	-11.9335	201.5964	390.1743	1515.9532
0.5819	71.178	79.7494	119.976	74.5177	130.1478	197.5453	-12.1683	199.6981	389.9042	1512.7563
0.5819	71.1968	79.7657	120.0737	74.5077	130.0404	197.5621	-12.294	202.1125	389.0514	1515.6159
0.582	71.1864	79.7489	120.0176	74.5185	130.0847	197.5297	-12.2789	200.6535	393.0613	1515.6632
0.5821	71.1827	79.7467	119.954	74.5294	130.0711	197.7807	-12.2994	201.3065	390.3649	1515.2555
0.5822	71.1778	79.7662	120.0116	74.5223	130.0475	197.691	-12.05	201.1616	390.1478	1513.3082
0.5823	71.2088	79.7533	120.0444	74.5167	130.104	197.4191	-11.9119	201.4939	386.4932	1514.5962
0.5824	71.2191	79.7587	120.0116	74.5321	130.0856	197.7674	-11.9231	201.8509	389.1203	1512.6259
0.5824	71.1976	79.7616	119.9361	74.5526	130.0628	197.6972	-12.1855	200.3556	390.6616	1512.5263
0.5825	71.1997	79.7519	119.9399	74.5132	130.1143	197.6431	-12.4895	201.8028	391.2174	1512.6176
0.5826	71.2099	79.7748	119.9195	74.5101	130.1014	197.9245	-12.8876	201.0748	390.2983	1515.3346
0.5826	71.2071	79.7618	119.9137	74.5553	129.9937	197.6161	-12.4322	201.2707	390.3259	1513.0183
0.5827	71.2398	79.7623	120.0236	74.5224	129.9905	197.7105	-12.1963	201.2429	389.2845	1512.4956
0.5828	71.2242	79.7467	120.0286	74.5372	130.0026	197.5133	-11.6461	200.8717	389.7294	1514.6575
0.5828	71.2393	79.7691	119.9017	74.5566	130.069	197.4902	-11.6498	200.444	388.5218	1514.4735
0.5829	71.2198	79.7593	119.9182	74.5471	130.0777	197.1786	-11.8175	202.2168	389.6338	1513.2347
0.583	71.2367	79.7583	119.9142	74.5379	130.0663	197.461	-12.3162	201.4407	390.1598	1514.3007
0.5831	71.231	79.7608	119.9949	74.5443	130.0571	197.5604	-12.4668	201.4126	389.5175	1509.8813
0.5832	71.229	79.7685	119.9112	74.5323	130.0982	197.7806	-12.2854	200.7829	389.5175	1512.9221
0.5833	71.2191	79.784	119.9731	74.5343	130.0379	197.9097	-12.0976	201.5737	389.1521	1512.9382
0.5834	71.229	79.7787	119.8667	74.5966	130.0364	197.5725	-11.7956	201.2965	389.1521	1513.0985
0.5835	71.1948	79.7369	119.9047	74.5563	130.0171	197.5297	-11.8879	201.3039	390.254	1516.1842
0.5835	71.1839	79.7577	120.0277	74.5168	130.0183	197.579	-11.8902	201.3419	388.9243	1513.6072
0.5836	71.2063	79.7814	119.9377	74.5339	130.0872	197.6106	-12.3618	201.6144	390.1155	1514.477
0.5838	71.1984	79.7634	119.8932	74.5802	130.0155	197.736	-12.7009	201.267	390.2983	1513.5393
0.5839	71.2137	79.7874	119.9227	74.517	130.0233	197.5852	-12.6318	201.4373	389.4804	1515.4395

0.584	71.2047	79.7614	119.8833	74.5743	130.0102	197.7629	-12.3613	202.1584	389.454	1517.4251
0.584	71.1749	79.7657	119.9022	74.5473	129.9909	197.4813	-11.8452	202.2044	389.7876	1513.0782
0.5841	71.1961	79.7772	119.8838	74.5529	129.9988	197.2716	-11.6582	200.4546	391.4825	1514.4735
0.5842	71.2012	79.7712	119.9425	74.5438	129.9899	197.6914	-11.7124	202.5604	391.7822	1512.2889
0.5842	71.2266	79.7516	120.1909	74.4882	129.8595	197.4759	-12.2905	201.6247	390.6827	1515.3245
0.5843	71.1831	79.7685	120.2447	74.4978	129.8533	197.6533	-12.7655	201.1413	389.7888	1514.982
0.5844	71.2271	79.7691	120.0964	74.4845	129.9488	197.7283	-13.2929	201.759	390.4497	1512.2196
0.5846	71.2391	79.7786	120.0718	74.5058	129.9362	197.7505	-13.2267	200.4511	389.6287	1514.7955
0.5847	71.2083	79.7809	120.1968	74.5024	129.8625	197.3449	-12.7135	201.2707	390.481	1511.4955
0.5847	71.2042	79.7584	120.2319	74.5277	129.8314	197.4671	-11.9509	202.777	389.9359	1513.1549
0.5848	71.2306	79.7579	120.0804	74.5194	129.8947	197.1907	-11.5027	201.6918	389.0567	1512.6796
0.5849	71.2346	79.7639	119.9099	74.5387	129.97	197.1442	-11.2635	201.5405	389.2462	1512.329
0.5849	71.2149	79.7837	119.9189	74.5301	130.0123	197.5639	-12.0265	201.5716	387.9656	1512.4496
0.585	71.2229	79.7522	119.9144	74.5483	129.9023	197.566	-12.5334	201.8139	389.9273	1513.3469
0.5851	71.22	79.784	119.9939	74.5165	129.9586	197.3933	-13.4052	200.9389	390.7887	1513.4999
0.5852	71.1797	79.7803	120.1407	74.5224	129.8	197.5808	-12.6633	201.7095	390.6986	1513.7912
0.5853	71.1788	79.8012	120.2198	74.5104	129.7551	197.6537	-12.0558	201.7272	390.0578	1512.3346
0.5855	71.1938	79.7766	120.0863	74.5274	129.8272	197.3337	-12.2683	200.6942	390.6914	1514.5973
0.5856	71.1917	79.7898	120.0747	74.5282	129.8224	197.2982	-12.7218	201.5822	389.7717	1511.8286
0.5857	71.2032	79.8064	119.8845	74.5254	129.9173	197.6849	-12.9886	201.6994	390.0269	1512.1206
0.5858	71.1912	79.7817	119.81	74.559	129.9774	197.0922	-12.3686	201.4776	389.9716	1511.3752
0.5859	71.2081	79.801	119.8569	74.5509	129.9844	197.6932	-11.5523	201.6439	389.6947	1508.6101
0.586	71.2364	79.8064	119.9717	74.5405	129.8698	197.3579	-11.6036	201.6144	388.8254	1511.784
0.586	71.2132	79.7845	119.8481	74.5506	129.9276	197.4804	-11.9214	201.0626	390.5503	1513.0246
0.5861	71.2477	79.7896	119.9418	74.5364	129.8781	197.4804	-12.8134	200.9707	389.544	1510.119
0.5862	71.2423	79.794	120.1243	74.5228	129.8219	197.1818	-13.3516	200.6313	389.8618	1514.1669
0.5864	71.2313	79.814	120.0736	74.5425	129.8419	197.5799	-12.027	201.8176	389.6726	1512.9301
0.5864	71.22	79.7937	120.0145	74.5545	129.8338	197.1516	-11.2016	201.7024	390.1902	1515.5469
0.5865	71.2223	79.7983	120.0821	74.4968	129.737	197.388	-11.74	201.2712	388.776	1512.8713
0.5866	71.2042	79.7828	119.9748	74.5287	129.8205	197.6332	-12.8141	201.3666	389.2209	1514.2359
0.5867	71.2247	79.774	119.9705	74.5584	129.8947	197.3924	-12.9558	202.2963	389.8724	1514.0366
0.5868	71.216	79.7886	120.0591	74.5353	129.7876	197.3783	-12.351	201.4629	389.7999	1514.6534
0.5869	71.2298	79.8132	120.116	74.5045	129.697	196.9872	-11.8498	202.1973	389.6128	1511.407
0.587	71.2132	79.7832	120.1886	74.5119	129.6478	197.3272	-11.76	201.7289	390.3813	1513.2187
0.587	71.1837	79.8061	120.1927	74.5267	129.6972	197.4146	-12.7544	201.7201	389.8565	1513.7912
0.5872	71.1981	79.8191	120.1393	74.4999	129.7431	197.409	-13.1066	202.0689	389.5784	1513.0664
0.5872	71.2071	79.7954	120.0909	74.5228	129.7671	197.5284	-12.51	202.1443	390.1902	1513.3236
0.5873	71.171	79.8056	120.1942	74.5062	129.6796	197.5221	-12.0328	201.1651	388.4211	1514.7649
0.5874	71.2037	79.8018	120.2867	74.5152	129.6286	197.4201	-11.3478	200.7459	389.1908	1513.6274
0.5875	71.2387	79.7731	120.1201	74.5084	129.7464	197.3997	-12.3754	201.4259	389.2185	1514.1083
0.5876	71.2037	79.8139	120.0198	74.5185	129.7796	197.42	-12.7174	201.9287	389.3639	1513.3696
0.5876	71.2117	79.7842	120.2007	74.5371	129.6575	197.3375	-12.5402	201.3224	389.8719	1514.6934
0.5878	71.1942	79.802	120.0491	74.5167	129.7707	197.1907	-12.0001	201.0096	389.5652	1512.8559
0.5879	71.2201	79.7791	120.0159	74.5292	129.7496	197.6297	-11.9839	201.3419	389.8989	1514.6269
0.588	71.2252	79.7901	120.1071	74.5231	129.7409	197.709	-12.5136	201.4739	389.1244	1513.3229
0.5881	71.1924	79.8003	120.2425	74.5189	129.6063	196.9357	-12.7769	201.3878	388.3894	1513.7452
0.5882	71.2186	79.8242	120.1545	74.495	129.696	197.5938	-12.2139	201.5072	388.853	1512.842
0.5883	71.2237	79.829	120.1279	74.5264	129.666	197.523	-11.4705	201.4691	389.5281	1513.6226
0.5883	71.23	79.8	120.1226	74.539	129.6667	197.1201	-11.545	199.6853	389.141	1515.8877
0.5884	71.2616	79.8156	120.1071	74.5296	129.7048	197.5328	-12.1588	200.9707	389.4063	1513.4462
0.5885	71.2331	79.8056	120.1236	74.5629	129.6428	197.304	-13.0858	200.4096	390.337	1513.916
0.5886	71.2413	79.8149	120.339	74.4906	129.5786	197.3071	-12.5596	200.5394	390.5027	1512.2043
0.5887	71.2209	79.8137	120.1455	74.547	129.6348	197.1061	-11.7646	201.5811	391.0513	1508.7383

0.5887	71.2508	79.8146	120.0957	74.535	129.6791	197.5897	-11.5174	201.2111	389.0196	1515.6389
0.5889	71.2249	79.828	120.0876	74.5516	129.6393	197.6589	-12.1701	201.6292	390.4035	1511.9523
0.5889	71.2379	79.8212	120.0985	74.5306	129.6343	197.3622	-12.684	201.4833	390.7834	1515.6695
0.589	71.2364	79.814	120.2153	74.5111	129.5301	197.4545	-12.7756	200.9048	388.2163	1514.3007
0.5891	71.2054	79.801	120.1	74.5101	129.5477	197.4146	-12.2856	200.5571	389.5175	1512.8636
0.5892	71.2078	79.8135	120.1645	74.5358	129.6114	197.3263	-12.0055	200.2803	389.2683	1513.4271
0.5892	71.2193	79.7954	119.9514	74.5779	129.7472	197.4191	-11.47	201.006	389.9412	1513.5382
0.5893	71.1777	79.8115	120.0631	74.5344	129.6025	197.304	-12.2754	201.2374	389.6061	1512.6737
0.5894	71.1998	79.8076	119.9927	74.5616	129.6979	197.149	-12.9679	201.1015	388.9932	1513.1319
0.5896	71.2247	79.8178	120.1554	74.5155	129.5553	197.4928	-13.1054	199.935	390.2643	1514.4735
0.5897	71.216	79.8166	119.9394	74.5661	129.7505	197.0588	-12.441	200.1546	389.2905	1513.0584
0.5897	71.1935	79.8329	119.9513	74.5364	129.7019	197.1525	-11.6753	201.2429	389.5334	1513.1626
0.5898	71.1927	79.8224	120.2021	74.5362	129.5375	196.8602	-11.4216	201.6459	389.3533	1512.6489
0.5899	71.2291	79.827	120.2444	74.5209	129.5106	197.4386	-11.7229	201.2464	389.0196	1513.8679
0.5899	71.1956	79.8132	120.2912	74.5028	129.5215	197.3782	-12.9031	201.2606	389.8671	1514.9642
0.59	71.2086	79.827	120.2235	74.5348	129.4935	197.4935	-13.2226	200.5353	388.7534	1514.9659
0.5901	71.221	79.8093	120.0711	74.5465	129.5642	197.2627	-12.2808	201.1899	389.3639	1511.9896
0.5902	71.2145	79.8319	119.9752	74.5754	129.6091	197.2511	-11.351	202.2892	391.2918	1511.016
0.5903	71.2233	79.8212	119.8218	74.5628	129.6872	197.0868	-11.2183	201.2747	388.9084	1513.1012
0.5903	71.2176	79.8461	119.9994	74.5356	129.641	197.0653	-12.3173	202.2759	389.8885	1513.1706
0.5904	71.2039	79.8044	119.9336	74.5843	129.6653	197.5301	-12.9076	201.1262	390.8787	1512.7179
0.5905	71.2398	79.8453	119.9761	74.5756	129.6229	197.4898	-13.3982	201.2263	390.0546	1513.5313
0.5906	71.2435	79.8244	119.8058	74.583	129.7878	197.4413	-12.9927	200.5147	389.4751	1514.3662
0.5907	71.2379	79.8261	120.0534	74.5626	129.5203	197.2351	-11.5485	200.5112	388.7866	1514.2206
0.5908	71.2452	79.8115	120.2476	74.5023	129.4877	197.1063	-10.5139	201.1262	390.1054	1514.6652
0.5909	71.2423	79.8013	120.2281	74.575	129.3825	197.1561	-11.7544	201.6176	388.7866	1513.6992
0.591	71.2472	79.8196	120.3042	74.5305	129.3872	196.9817	-12.9914	200.7089	388.7091	1515.551
0.591	71.253	79.8314	120.1564	74.531	129.4825	197.2805	-13.2778	201.706	389.5546	1515.2095
0.5911	71.2421	79.8083	120.3636	74.5035	129.3151	197.0263	-13.9331	200.2213	388.4105	1512.6719
0.5912	71.2012	79.8196	120.26	74.493	129.4178	197.3532	-14.2649	201.3926	389.7169	1514.1324
0.5912	71.2435	79.8317	120.2873	74.5305	129.4534	197.2494	-13.7633	201.3207	390.4391	1512.8559
0.5913	71.2449	79.8478	120.1085	74.5679	129.486	196.8832	-10.8524	200.9011	389.8553	1512.297
0.5914	71.2399	79.8256	120.035	74.5608	129.502	197.2032	-9.6484	201.0131	388.3894	1511.7596
0.5915	71.2423	79.83	120.2229	74.547	129.4058	197.0133	-11.8355	201.5109	389.3902	1511.784
0.5916	71.2425	79.8356	120.2414	74.5179	129.4125	196.7171	-13.371	201.706	389.6128	1512.1659
0.5917	71.2436	79.8339	120.2424	74.5414	129.4501	197.0606	-13.573	202.9152	389.8497	1512.329
0.5917	71.2196	79.8589	120.1877	74.5313	129.4565	197.0788	-14.0918	201.4797	389.2845	1514.5579
0.5918	71.2314	79.8344	120.1105	74.5343	129.5452	197.3152	-14.7342	201.3224	389.1631	1513.1946
0.5919	71.224	79.8584	120.2288	74.5026	129.4237	197.5275	-12.8649	201.3807	387.1818	1514.5809
0.592	71.2423	79.8199	120.0416	74.5812	129.4517	197.2436	-9.6482	201.0452	389.7501	1513.8599
0.5921	71.2384	79.829	120.2051	74.5638	129.3549	196.8433	-9.1691	201.7236	388.1192	1512.4649
0.5922	71.2252	79.8613	120.0581	74.5572	129.4158	197.1275	-10.7434	200.9048	389.9328	1513.2988
0.5922	71.222	79.8249	120.1745	74.5447	129.3482	196.941	-12.9451	200.4723	388.3364	1512.2503
0.5923	71.2374	79.8134	120.2914	74.5347	129.3479	196.8895	-13.5436	200.6101	390.1478	1512.7179
0.5924	71.226	79.8265	120.0925	74.5363	129.4377	196.925	-14.11	201.5552	390.1543	1514.2526
0.5924	71.2359	79.8168	120.1451	74.5269	129.4641	197.3658	-14.9178	200.8399	389.8777	1512.5876
0.5926	71.2477	79.8066	120.3323	74.5057	129.3958	197.1845	-13.2411	200.7904	389.1097	1514.5119
0.5926	71.2275	79.8483	119.8999	74.5922	129.5321	197.3867	-9.5059	201.3298	389.069	1514.0202
0.5927	71.2294	79.8395	119.7194	74.59	129.6209	197.077	-9.2605	199.7688	388.5388	1515.8688
0.5928	71.2325	79.8499	120.1327	74.563	129.4161	197.3142	-10.9704	200.7126	389.7082	1515.9455
0.5928	71.2206	79.8313	120.0408	74.5855	129.5081	197.1591	-12.9111	201.4924	389.5009	1511.0707
0.5929	71.2367	79.8273	119.9563	74.5538	129.4999	197.3267	-13.5007	200.8505	388.8449	1513.5689
0.593	71.2193	79.8478	120.1128	74.5595	129.5325	197.1777	-14.1967	201.1931	389.5397	1512.4172

0.5931	71.214	79.8533	120.1942	74.5452	129.4582	197.0503	-14.9072	200.8293	389.0461	1513.3312
0.5932	71.2339	79.8344	120.3694	74.5587	129.2779	197.0931	-12.0773	201.4813	389.9771	1513.948
0.5933	71.2123	79.8297	120.2068	74.546	129.3161	196.9126	-9.3327	201.5716	389.3586	1514.3585
0.5933	71.2293	79.8552	120.159	74.6016	129.3197	196.9408	-9.5658	201.8768	390.6637	1511.3191
0.5934	71.2076	79.8567	119.986	74.5889	129.4842	197.228	-11.296	199.9951	388.1139	1514.1439
0.5935	71.244	79.8541	120.2333	74.5608	129.3306	197.0823	-13.1085	201.66	389.0779	1514.7879
0.5935	71.215	79.841	120.2772	74.5182	129.3429	197.357	-13.6485	201.4074	389.5895	1513.5713
0.5936	71.223	79.8672	120.169	74.5733	129.3808	197.0503	-14.4309	201.1828	387.7273	1513.8142
0.5937	71.2079	79.8567	120.426	74.4891	129.2174	196.6194	-14.5142	200.8531	388.842	1511.0466
0.5937	71.2167	79.8365	120.4226	74.5052	129.2454	197.204	-13.5434	200.5394	388.008	1512.1276
0.5938	71.1992	79.8557	120.1843	74.5738	129.2802	196.9166	-10.1583	201.1044	389.3348	1511.4394
0.5939	71.2394	79.8762	120.1265	74.564	129.3242	197.021	-10.0961	200.8222	389.3268	1513.9752
0.594	71.214	79.846	120.1759	74.5852	129.3734	196.6611	-10.8048	200.3238	389.7982	1512.1046
0.594	71.2109	79.8674	120.1318	74.5433	129.3922	197.2808	-12.4917	201.5442	388.2163	1514.5251
0.5941	71.2115	79.8631	120.1019	74.5511	129.333	197.0343	-13.5557	201.303	390.7039	1513.2469
0.5942	71.205	79.8438	120.3681	74.5192	129.2444	196.9361	-13.8621	200.4355	388.9361	1512.858
0.5943	71.228	79.8565	120.2043	74.5432	129.3026	197.4526	-12.6332	199.8885	388.7368	1512.3611
0.5943	71.1928	79.8646	120.2586	74.5528	129.2473	196.9473	-10.7531	201.7252	389.5341	1512.9382
0.5945	71.1936	79.8654	120.3146	74.536	129.1438	196.9845	-11.3902	201.2818	389.8221	1513.0263
0.5945	71.2045	79.8414	120.3222	74.5198	129.2025	196.7225	-12.526	199.5532	388.5271	1514.4045
0.5947	71.2265	79.8626	120.3794	74.5409	129.1809	197.0792	-13.2626	201.0452	389.9771	1514.437
0.5948	71.2357	79.8506	120.2885	74.5659	129.2475	196.8931	-12.8684	201.7448	389.4592	1512.2119
0.5949	71.2035	79.8499	120.3241	74.5228	129.2055	196.7243	-11.3555	198.6357	387.0257	1513.6595
0.5949	71.234	79.8636	120.2976	74.5508	129.1946	196.5483	-11.1494	200.7833	389.3586	1514.9182
0.5951	71.2093	79.8487	120.2359	74.5464	129.2427	196.7784	-12.0534	201.5575	387.8067	1514.2359
0.5951	71.2061	79.8677	120.1128	74.585	129.3608	197.0969	-12.758	200.3763	388.9749	1515.1182
0.5952	71.2334	79.8644	120.1292	74.5738	129.3175	196.9306	-13.0504	201.3187	388.4045	1514.7014
0.5953	71.2225	79.8618	120.32	74.5883	129.2051	197.1196	-13.5766	201.7307	389.4592	1511.7213
0.5954	71.2057	79.8694	120.2024	74.5464	129.2641	197.0637	-12.4844	200.5465	389.2315	1512.4573
0.5955	71.1961	79.8356	119.9905	74.574	129.3554	197.0512	-11.1889	200.5925	388.9614	1513.6762
0.5956	71.226	79.8847	119.9551	74.6111	129.363	196.9037	-11.5508	201.0273	389.1203	1513.9829
0.5957	71.2378	79.8687	120.0858	74.5677	129.3588	197.2325	-12.4533	200.0733	389.2517	1512.5534
0.5958	71.2264	79.8828	120.2269	74.5786	129.2837	197.0574	-13.1001	200.9778	389.883	1513.2852
0.596	71.201	79.8728	120.477	74.508	129.1189	196.8117	-11.8138	200.587	388.1166	1513.9801
0.596	71.2487	79.8568	120.3074	74.5363	129.1017	196.8451	-11.4162	201.3889	389.7888	1517.8593
0.5961	71.2247	79.871	120.4004	74.5343	129.1421	196.9324	-11.3631	199.7629	388.1	1515.1262
0.5962	71.2023	79.8611	120.2582	74.5301	129.2244	197.0868	-12.282	201.6423	388.4847	1513.4846
0.5963	71.2223	79.8689	120.1726	74.5477	129.3225	196.9615	-13.0447	200.1683	388.9243	1514.7189
0.5964	71.2333	79.8677	120.0139	74.5759	129.3524	196.8664	-13.6315	200.9141	389.544	1513.0016
0.5965	71.2452	79.8577	120.2309	74.5534	129.2948	196.5918	-13.5568	202.3175	390.1478	1512.1353
0.5965	71.2291	79.8677	120.4493	74.4975	129.0664	196.624	-12.6801	201.1413	388.3381	1514.9659
0.5966	71.2245	79.8711	120.338	74.5232	129.1987	196.7171	-11.2214	199.9845	389.2951	1512.0739
0.5967	71.1979	79.885	120.1629	74.5393	129.3187	196.8247	-10.6285	200.8753	390.5751	1512.7939
0.5967	71.2203	79.8694	120.1052	74.496	129.3006	196.7011	-10.6382	200.7586	388.7654	1514.3355
0.5968	71.2209	79.8977	120.4125	74.5441	129.1392	197.2678	-12.0171	201.5959	390.0823	1514.445
0.5969	71.237	79.8832	120.3434	74.5475	129.1898	196.6798	-12.5974	200.7126	388.9693	1513.6755
0.5969	71.2282	79.8572	120.4278	74.5544	129.1006	196.7802	-13.3543	200.5182	388.9402	1514.5732
0.597	71.2429	79.8535	120.4588	74.5098	129.1232	197.0272	-14.0164	201.1746	390.7523	1511.9122
0.5971	71.244	79.893	120.3244	74.5464	129.1808	196.933	-13.9366	200.6596	388.8343	1510.763
0.5972	71.2109	79.8776	120.1105	74.575	129.2839	196.5432	-12.6876	200.4281	388.2052	1514.8056
0.5972	71.2367	79.876	120.4942	74.5466	129.0882	196.8593	-10.6763	202.5367	390.7251	1510.8166
0.5973	71.2455	79.8701	120.3207	74.5866	129.1582	196.7153	-10.0782	201.402	389.0832	1511.7443
0.5974	71.2482	79.8664	120.2499	74.5669	129.1341	196.8182	-10.067	200.1546	388.7921	1513.1225

0.5974	71.2492	79.8786	120.1919	74.5771	129.2132	196.7269	-12.0989	201.7201	388.4052	1513.3849
0.5975	71.2286	79.8697	120.2911	74.5809	129.1527	196.6565	-12.6529	201.1598	389.0801	1512.5534
0.5976	71.2909	79.8716	120.1922	74.5701	129.1826	196.9384	-13.2906	199.6274	388.9455	1514.7725
0.5976	71.2484	79.9022	120.1279	74.5824	129.2589	196.7251	-13.6911	201.0096	389.5122	1512.9326
0.5977	71.2446	79.901	120.3668	74.5587	129.1361	197.1665	-14.0365	201.995	389.2683	1513.4191
0.5978	71.2349	79.8761	120.3246	74.5054	129.1139	196.8293	-13.3211	200.7053	388.172	1512.7618
0.5979	71.2499	79.8794	120.3788	74.5581	129.0851	196.479	-10.9933	200.6879	389.3162	1512.5339
0.598	71.2343	79.8954	120.2718	74.5757	129.088	196.8255	-10.5218	201.1899	388.633	1512.0969
0.5981	71.2379	79.8845	120.3649	79.8845	129.0523	196.7944	-11.3944	200.8399	389.2315	1513.4156
0.5981	71.2494	79.891	120.1745	74.6227	129.1411	196.6842	-12.0437	199.9738	387.5313	1512.5569
0.5982	71.2806	79.8758	120.4328	74.5623	129.0126	196.651	-12.8953	200.4576	389.4954	1515.6392
0.5983	71.2421	79.8813	120.3678	74.5518	129.0551	196.527	-13.2685	200.2849	388.8131	1514.5962
0.5984	71.2631	79.8949	120.5267	74.5603	128.9754	196.7011	-12.217	200.9566	389.544	1513.1089
0.5985	71.2428	79.8991	120.3695	74.5974	129.0187	196.4203	-10.9066	200.345	387.7273	1514.3815
0.5985	71.251	79.8769	120.2962	74.5707	129.0682	196.6872	-10.6431	200.6387	388.1332	1513.4992
0.5986	71.2689	79.8769	120.3024	74.5847	129.0693	196.8665	-11.782	201.267	389.4677	1510.734
0.5987	71.2614	79.9005	120.3654	74.5664	129.0861	196.5634	-12.6494	201.8191	389.8459	1515.7079
0.5988	71.2685	79.8808	119.9554	74.6211	129.3394	197.0814	-13.3776	199.9597	387.632	1512.7179
0.5989	71.2831	79.8954	120.5286	74.5427	128.9749	196.71	-14.1584	199.7971	388.8925	1513.3236
0.599	71.2582	79.8803	120.444	74.5637	128.9858	196.9019	-14.2449	200.9177	389.2315	1512.3729
0.5991	71.2655	79.8925	120.7554	74.5254	128.8342	196.846	-12.7943	199.9491	388.9402	1512.9402
0.5991	71.254	79.8786	120.6469	74.5245	128.8166	196.4008	-10.6609	199.5461	387.6373	1515.2019
0.5992	71.2621	79.8842	120.3415	74.5761	128.9575	196.2071	-10.3403	200.1223	389.1626	1512.9326
0.5993	71.2439	79.8926	120.6199	74.5263	128.8605	196.2088	-11.5167	201.5996	390.2318	1512.7618
0.5994	71.2465	79.8954	120.6096	74.5498	128.9389	196.8042	-13.226	201.8933	389.2951	1511.9359
0.5995	71.2273	79.8786	120.7533	74.4993	128.8068	197.03	-14.2375	200.8087	388.5485	1513.4431
0.5996	71.2287	79.8898	120.8137	74.502	128.8042	196.646	-14.7297	200.4581	390.5768	1513.0016
0.5997	71.2176	79.8944	120.785	74.4959	128.8209	196.506	-14.4685	200.9344	389.8774	1511.6397
0.5997	71.2321	79.9176	120.6383	74.5303	128.8008	196.4701	-11.9836	201.3419	389.8936	1512.0203
0.5998	71.2406	79.8993	120.661	74.5095	128.7973	196.7802	-10.5906	202.1089	390.8522	1513.2086

Appendix I3:
Test Results, Raw Data
Leakage System

Leakage System Measurement Test Data					
Time Stamp	Scale Output (g)	Scale Output (mL)	Normalized Scale Output (g)	Normalized Scale Output (mL)	Leakrate Running Average (mL/min)
3:07:09 PM	18.34	18.376754	0	0	0.00
3:07:20 PM	20.87	20.911824	2.53	2.53507	13.83
3:07:29 PM	24.37	24.418838	6.03	6.042084	18.13
3:07:36 PM	25.08	25.130261	6.74	6.753507	15.01
3:07:47 PM	29.39	29.448898	11.05	11.072144	17.48
3:07:54 PM	34.57	34.639279	16.23	16.262525	21.68
3:07:59 PM	38.39	38.466934	20.05	20.09018	24.11
3:13:37 PM	38.93	39.008016	20.59	20.631262	3.19
3:13:40 PM	40.65	40.731463	22.31	22.354709	3.43
3:13:49 PM	44.52	44.609218	26.18	26.232464	3.93
3:13:57 PM	46.56	46.653307	28.22	28.276553	4.16
3:14:35 PM	51	51.102204	32.66	32.72545	4.40
3:14:49 PM	54.33	54.438878	35.99	36.062124	4.70
3:14:59 PM	57.35	57.46493	39.01	39.088176	4.99
3:15:08 PM	59.79	59.90982	41.45	41.533066	5.20
3:15:14 PM	64.01	64.138277	45.67	45.761523	5.66
3:15:24 PM	66.25	66.382766	47.91	48.006012	5.82
3:16:06 PM	70.77	70.911824	52.43	52.53507	5.87
3:16:12 PM	72.87	73.016032	54.53	54.639278	6.04
3:16:21 PM	76.19	76.342685	57.85	57.965931	6.30
3:16:31 PM	79.6	79.759519	61.26	61.382765	6.55
3:16:45 PM	82.29	82.45491	63.95	64.078156	6.67
3:16:59 PM	85.84	86.012024	67.5	67.63527	6.88
3:17:03 PM	88.87	89.048096	70.53	70.671342	7.14
3:17:27 PM	90.79	90.971944	72.45	72.59519	7.05
3:18:22 PM	103.04	103.246493	84.7	84.869739	7.57
3:18:31 PM	105.36	105.571142	87.02	87.194388	7.67
3:18:32 PM	106.17	106.382766	87.83	88.006012	7.73
3:18:44 PM	106.79	107.004008	88.45	88.627254	7.65
3:18:54 PM	111.5	111.723447	93.16	93.346693	7.94
3:18:55 PM	112.79	113.016032	94.45	94.639278	8.04
3:19:07 PM	116.93	117.164329	98.59	98.787575	8.26
3:19:12 PM	117.6	117.835671	99.26	99.458917	8.25
3:20:34 PM	121.99	122.234469	103.65	103.857715	7.74
3:20:50 PM	125.31	125.561122	106.97	107.184368	7.83
3:22:07 PM	131.66	131.923848	113.32	113.547094	7.59
3:22:19 PM	135.52	135.791583	117.18	117.414829	7.74
3:22:22 PM	136.87	137.144289	118.53	118.767535	7.81
3:22:39 PM	140.8	141.082164	122.46	122.70541	7.92
3:22:50 PM	143.94	144.228457	125.6	125.851703	8.02
3:24:06 PM	145.16	145.450902	126.82	127.074148	7.50
3:24:19 PM	149.07	149.368737	130.73	130.991983	7.63

3:24:44 PM	158.1	158.416834	139.76	140.04008	7.96
3:25:01 PM	158.68	158.997996	140.34	140.621242	7.87
3:25:03 PM	160.66	160.981964	142.32	142.60521	7.97
3:25:07 PM	163.97	164.298597	145.63	145.921843	8.12
3:25:08 PM	164.57	164.8998	146.23	146.523046	8.15
3:25:49 PM	165.23	165.561122	146.89	147.184368	7.88
3:25:53 PM	166.37	166.703407	148.03	148.326653	7.92
3:26:07 PM	169.34	169.679359	151	151.302605	7.98
3:26:19 PM	171.58	171.923848	153.24	153.547094	8.01
3:26:31 PM	176.4	176.753507	158.06	158.376753	8.18
3:27:10 PM	179.47	179.829659	161.13	161.452905	8.07
3:27:31 PM	182.2	182.56513	163.86	164.188376	8.06
3:27:41 PM	185.69	186.062124	167.35	167.68537	8.17
3:28:07 PM	190.64	191.022044	172.3	172.64529	8.23
3:28:10 PM	192.42	192.805611	174.08	174.428857	8.30
3:28:15 PM	193.02	193.406814	174.68	175.03006	8.30
3:28:40 PM	199.09	199.488978	180.75	181.112224	8.42
3:29:26 PM	204.4	204.809619	186.06	186.432865	8.37
3:29:40 PM	207.12	207.53507	188.78	189.158316	8.40
3:29:52 PM	210.17	210.591182	191.83	192.214428	8.46
3:29:58 PM	210.74	211.162325	192.4	192.785571	8.45
3:30:02 PM	212.55	212.975952	194.21	194.599198	8.50
3:30:34 PM	218.98	219.418838	200.64	201.042084	8.59
3:30:53 PM	224.33	224.779559	205.99	206.402805	8.70

Appendix J:
ATI Calibration Record,
Custom Telemetry Record



Transducerized Component Calibration Record

Date:	18-Dec-14
Customer:	FLOWERVE
Customer Order Number:	985622
Gaged Component Description:	Custom Torque Sensor Positive Output
Bridge Resistance:	700 Ohms
Gaged Component S/N:	1452
Transmitter Frequency:	902.62 MHz
Transmitter S/N:	3186/3187
Collar S/N:	14148
Receiver S/N:	2375

Calibration Data	
Transmitter	
Shunt Calibration Resistor (recommended)	60.4 K Ohms
Transmitter Gain Resistor (recommended)	1.87 K Ohms
Excitation:	5.00 Volts
Receiver	
Shunt Calibration Equivalent:	32.46 in-lb
Full Scale Torque:	50.00 in-lb
Full Scale Display Reading:	10.00 Volts
Receiver Output @ Zero:	12.000 mA
Receiver Output @ Shunt:	17.194 mA
Full Scale Receiver Output:	20.000 mA
Output Scaling:	0.160 mA/in-lb
Display Reading @ Shunt:	6.49 Volts
Full Scale Bridge Output:	4.546 mV/V
Shunt Cal. Output (measured):	3.021 mV/V
Worst Case Non-Linearity:	0.15% of Full-Scale
Worst Case Hysteresis:	0.38% of Full-Scale

Applied Load (in-lb)	Bridge Output mV/V	Expected Output in-lb	Deviation Expected vs. Actual	
			in-lb	%
0.00	0.147753	0.00	0.00	0.00%
8.68	0.908242	8.65	-0.04	0.07%
16.97	1.637674	16.94	-0.03	0.06%
25.35	2.373337	25.30	-0.05	0.10%
33.80	3.114505	33.73	-0.08	0.15%
42.14	3.852525	42.12	-0.02	0.04%
50.31	4.573000	50.31	0.00	0.00%
42.19	3.854466	42.14	-0.05	0.09%
33.78	3.109167	33.67	-0.11	0.23%
25.44	2.369050	25.25	-0.19	0.38%
17.04	1.631041	16.86	-0.18	0.35%
8.70	0.904279	8.60	-0.10	0.21%
0.00	0.144841	0.00	-0.03	0.06%

ELECTRICAL CONNECTIONS		
Wire Color	Connector Pin	Bridge I.D.
Red	N/A	+ Excitation
Black	N/A	- Excitation
White	N/A	- Signal
Green	N/A	+ Signal

Michael R. Carter
Technician



Transducerized Component Calibration Record

Date:	18-Dec-14
Customer:	FLOWERVE
Customer Order Number:	985622
Gaged Component Description:	Custom Torque Sensor Negative Output
Bridge Resistance:	700 Ohms
Gaged Component S/N:	1452
Transmitter Frequency:	902.62 MHz
Transmitter S/N:	3186/3187
Collar S/N:	14148
Receiver S/N:	2375

Calibration Data	
Transmitter	
Shunt Calibration Resistor (recommended)	60.4 K Ohms
Transmitter Gain Resistor (recommended)	1.87 K Ohms
Excitation:	5.00 Volts
Receiver	
Shunt Calibration Equivalent:	-32.90 in-lb
Full Scale Torque:	-50.00 in-lb
Full Scale Display Reading:	-10.00 Volts
Receiver Output @ Zero:	12.000 mA
Receiver Output @ Shunt:	6.736 mA
Full Scale Receiver Output:	4.000 mA
Output Scaling:	0.160 mA/in-lb
Display Reading @ Shunt:	-6.58 Volts
Full Scale Bridge Output:	-4.148 mV/V
Shunt Cal. Output (measured):	-2.720 mV/V
Worst Case Non-Linearity:	0.28% of Full-Scale
Worst Case Hysteresis:	0.13% of Full-Scale

Applied Load (in-lb)	Bridge Output mV/V	Expected Output in-lb	Deviation Expected vs. Actual	
			in-lb	%
0.00	0.155437	0.00	0.00	0.00%
-9.05	-0.627782	-9.10	0.05	0.11%
-17.40	-1.348962	-17.48	0.07	0.15%
-25.79	-2.072087	-25.88	0.09	0.19%
-34.14	-2.795377	-34.28	0.14	0.28%
-42.60	-3.519482	-42.70	0.10	0.20%
-50.76	-4.213908	-50.76	0.00	0.00%
-42.64	-3.516975	-42.67	0.02	0.05%
-34.19	-2.793032	-34.26	0.07	0.13%
-25.71	-2.059873	-25.74	0.02	0.05%
-17.31	-1.333998	-17.30	0.00	0.01%
-8.90	-0.609502	-8.89	-0.02	0.03%
0.00	0.155760	0.00	0.00	0.00%

ELECTRICAL CONNECTIONS		
Wire Color	Connector Pin	Bridge I.D.
Red	N/A	+ Excitation
Black	N/A	- Excitation
White	N/A	- Signal
Green	N/A	+ Signal

Michael R. Catron
Technician

Appendix K:
Flowserve Leakage
Detection Code

Appendix K. Flowserve Leakage Detection Code

CAL POLY
SAN LUIS OBISPO

FLOWSERVE
Advanced Technology

ATI Advanced
Telemetry
International

Start Leakage Measurement

Valve State ☒

Level Sensor ☒

Leakage Resolution (g)

Drain Cycle Time (s)

Current Leakage Rate (mL/min)

Average Leakage Rate (mL/min)

