



Radar Reflectivity Experiment: Infrared Measurements

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Abstract

We will stress large blocks of basic rocks with Bustar and detect the infrared emissions. We will focus on the spatial distribution of thermal infrared band and how the emission changes as a function of stress and time.



Infrared spectrometer, modified for emissions

Introduction

Before earthquakes and volcanic eruptions, increased stress activates electronic charge carriers within the Earth's crust. The charge carriers can move out of the rocks and travel for kilometers. These can react at the surface in a variety of processes. One involves the charge carriers releasing energy as infrared emissions, which are detected as "thermal infrared anomalies."

Procedure

- Construct working platform of plastic pallets
- Drill vertical holes in rock and fill with Bustar
- Record various data, including radar reflectivity, air ionization, electrical current and potential, and sounds
- Wait for rock to crack



Plastic pallet platform in Building 212

Future Work

- Wait for NASA clearance to begin project
- After controlled lab set-up, move project to test on rocks in the field



Practice run to measure emissions

Applications

We predict that the arrival of charge carriers at the surface will produce infrared emissions. Our goal is to determine if these emissions precede earthquakes and volcanic eruptions. If our idea proves to be correct, our experiment will lay the foundation for future experiments in this field.



Rocks ready for drilling

Acknowledgements

Friedemann Freund, Bob Dahlgren, Colin Williams Anvesh Cherukupally, Garrett Benjamin, Jake Edman, Alex Bogatko, Christina Bridge, NASA Ames, SETI Institute, STAR program

