

Project Details

ROSES ID: NRA-00-OSS-01

Selection Year: 2001

Program Element: Independent Investigation: LWS

Project Title:

Seismic Forecasting of Solar Activity

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Summary:

We propose to use standard techniques in phase-coherent seismic imaging to develop the capability for real-time monitoring of the deep solar interior and far side for space-weather forecasting applications. The advent of far-side solar imaging now opens the way for a quick, comprehensive and inexpensive synoptic monitor of large active regions anywhere on the solar surface. We will develop a flexible, portable software package for this utility. In the first year of the project we will implement a working demonstration of our ability to predict the appearance of large active regions from behind the solar limb up to a week in advance, using available SOHO-MDI observations. The ability to predict the emergence of solar activity from directly beneath the solar surface will also have immediate applications to space-weather forecasting. We will conduct a careful study to assess subsurface seismic Doppler and wave-speed perturbations as possible precursors to near-side active-region emergence. We will also extend our near-surface investigation to low spherical-harmonic degrees to probe for signatures of prospective surface activity deep in the convection zone. Finally, we will explore both forward and inverse holographic models in terms of subsurface sound-speed and Doppler variations that would give rise to the observed signatures.

Publication References:

Summary: no summary

Reference: Braun, D. C.; Lindsey, C.; (2001), Seismic Imaging of the Far Hemisphere of the Sun, The Astrophysical Journal, Volume 560, Issue 2, pp. L189-L192, doi: 10.1086/324323