

Project Details

ROSES ID: NRA-01-OSS-01

Selection Year: 2002

Program Element: Independent Investigation: Solar Helio LWS

Project Title:

Heliotomography Tools for Studying Interior Sources of Solar Activity

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Summary:

This proposal is to develop tools to allow exploitation of the promise of acoustic tomography (heliotomography) of the solar interior for the LWS program. This will allow substantial improvement of our understanding of physical processes inside the Sun and mechanisms of solar variability. Heliotomography is a technique for inferring the 3-D structures and mass flows by observing packets of acoustic waves propagating through the solar interior. The development of robust tools for heliotomographic inferences is required for monitoring active processes in the solar interior to meet the demands of Living with the Star. These analytical tools (theoretical, modeling, and data analysis) tools will provide diagnostics for the internal structures as sunspots, active regions, and complexes of activity which play crucial role in solar variability, allow us to investigate dynamo processes in the convection zone, and lead to new methods for space weather forecasts. The tools will be prepared for real-time analyses of the LWS/SDO data and will be tested using the SOHO/MDI data. The initial analysis will focus on studying properties of emerging active regions and evolution of sunspots and active regions in the upper convection zone prior to strong CME and flares.

Publication References:

Summary: no summary

Reference: Kosovichev, A. G.; Duvall, T. L.; Birch, A. C.; Gizon, L.; Scherrer, P. H.; Zhao, Junwei; (2002), Local-area helioseismology as a diagnostic tool for solar variability, *Advances in Space Research*, Volume 29, Issue 12, p. 1899-1910, doi: 10.1016/S0273-1177(02)00241-7