Project Details

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Program Element: Solar Dynamics Observatory

Project Title:
Global Helioseismology in the Era of SDO

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Summary:
With the launch of SDO, that carries HMI -the successor to MDI- we can anticipate being able to precisely characterize p-modes properties throughout solar cycle 24. Such characterization will lead to compelling inferences of the physical properties of the solar interior and their evolution with solar activity.

We propose to carry over to HMI observations our state-of-the-art fitting methodology developed and applied to the MDI observations. We will provide an alternative to the standard pipe-line, known to have produced biased estimates when used on MDI observations. This is a natural carry over of our current efforts funded by NASA grant NNX09AB15G (2008-2011: Time Series Mode Fitting: Improved Methodology Using Long and Very Long Time Series).

In collaboration with Dr. Eff-Darwich we will then exploit these results using our best inversion techniques and further study the internal solar rotation and it's evolution over cycle 24.

The work proposed here will directly contribute to our understanding of the Sun, a key element of NASA Strategic Goals and Research Objectives. More specifically it will help us answer NASA's science question "How and why does the Sun vary?". It will greatly improve the scientific return of NASA's SDO mission by implementing a state-of-the-art mode fitting analysis tool, and carry over from MDI what we have learned about mode characterization.

Publication References:

Summary: no summary

Reference: Korzennik, S. G.; Eff-Darwich, A.; (2013), Mode Frequencies from 17, 15 and 2 Years of GONG, MDI, and HMI Data, Journal of Physics: Conference Series, Volume 440, Issue 1 article id. 012015 (2013), doi: 10.1088/1742-6596/440/1/012015

Summary: no summary

Reference: Eff-Darwich, A.; Korzennik, S. G.; (2013), The Dynamics of the Solar Radiative Zone, Solar Physics, Volume 287, Issue 1-2, pp. 43-56, doi: 10.1007/s11207-012-0048-z