

Project Details

ROSES ID: NRA-01-OSS-01

Selection Year: 2002

Program Element: Independent Investigation: Solar Helio LWS

Project Title:

Local Solar Magnetic Fields

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Summary:

The goal of this research is to understand solar variability produced by small (granule to supergranule network) scale magnetic fields. We will model the small scale local solar dynamo to determine the behavior of magnetic flux tubes at the surface of the quiet Sun. The results will provide the needed input boundary conditions for studying the behavior of the chromosphere and corona driven by flux emergence, motion and disappearance at the photospheric level. We will accomplish this by performing realistic magneto-hydrodynamic simulations of the solar photosphere and upper convection zone (down to a depth of 10-20 Mm) on the scale of supergranulation. The results will help us interpret the observations from SOHO and SolarB, and assist in the design of SDO and the ATST. Our realistic simulations of non-magnetic solar convection agree well with observations of photospheric line profiles, the granulation spectrum, p-mode frequencies and excitation. They have enabled us to understand the p-mode driving mechanism, surface effects on the p-mode frequencies, the impact of stratification on solar convection, and the non-local driving of solar convection.

Publication References:

no references