

Project Details

ROSES ID: NNH06ZDA001N

Selection Year: 2007

Program Element: Focused Science Topic

Topic: Solar Origins of Irradiance Variations

Project Title:

Coronal Heating Origins of the Solar Spectral Irradiance

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Project Member(s):

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- DeVore, C Richard; Collaborator; NASA Goddard Space Flight Center

Summary:

We will develop a new class of realistic physics-based models of active regions and the global Sun, which will be the predecessors of operational space weather models for predicting the soft X-ray and UV spectral irradiance. Impulsive coronal heating is a fundamental feature of these models. By determining the values of key coronal heating parameters that best reproduce a variety of imaging and irradiance observations, we will gain important physical insights about the nature of the heating mechanism. At the same time, we will continue our detailed investigation of the secondary instability of electric current sheets, which we feel is the most promising of the mechanisms so far proposed. We will perform sophisticated 3D MHD simulations that treat the instability in a far more realistic manner than before. Knowledge gained will be incorporated into the active region and global Sun models to further improve their realism.

Publication References:

Summary: no summary

Reference: Klimchuk, J. A., Patsourakos, S., & Cargill, P. A. 2008, "Highly Efficient Modeling of Dynamic Coronal Loops," ApJ, 682, 1351

Summary: no summary

Reference: Patsourakos, S. & Klimchuk, J. A. 2008, "Static and Impulsive Models of Solar Active Regions," ApJ, in press