

Project Details

ROSES ID: NRA-02-OSS-01

Selection Year: 2003

Program Element: Independent Investigation: LWS

Project Title:

On the Physics of Strong Magnetic Storms

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Summary:

The objective of the Sun Earth Connection (SEC) Living with a Star (LWS) program is to develop the scientific understanding of the solar terrestrial environment. A critical element in achieving this objective is the development of models that are physics based. The Lyon-Fedder- Mobarry (LFM) model, with its complement of subsidiary modules, diagnostics and visualization components has been an important contributor in understanding and modeling the magnetosphere-ionosphere system in ISTP. In assessing the performance of LFM against the ISTP database we found that the model performed well against data collected under weak and moderate solar wind conditions when v is smaller than 5 mV/m. However, there were significant discrepancies between the ground based measurements and the LFM model for larger values of the solar wind electric field. It is the objective of the proposal to study the importance of an upgraded physics based LFM ionospheric module that includes anomalous heating due to electrojet instabilities, effects of neutrals on ion heating due to interaction between the magnetosphere and ionosphere-thermosphere system, and altitude dependent precipitation, in the understanding the phenomenology of super-storms.

Publication References:

Summary: "

Reference: Papadopoulos, Konstantinos U MD - On the Physics of Strong Magnetic Storms