

Project Details

ROSES ID: NRA-01-OSS-01

Selection Year: 2002

Program Element: Independent Investigation: Solar Helio LWS

Project Title:

Forecasting Shocks and Energetic Particle Hazards Using L1 Monitors

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Summary:

We propose to identify, characterize and model shock events and associated energetic storm particle (ESPs) events using available data from the ACE, Wind, and IMP 8 spacecraft. Where possible we will monitor the movement of the shocks through the Earth's magnetosheath using data from Geotail and Interball. This work will extend the understanding of shock acceleration and the propagation of these disturbances through the interplanetary medium and the magnetosheath and speaks to furthering our understanding of the effects solar activity has on the Earth's environment. We propose to use this knowledge to develop a radiation hazard warning system to be utilized by astronauts, NASA, and operators of various satellites. This warning system will rely the current Real-Time Solar Wind system which makes ACE plasma, magnetic field, and energetic particle data available to the public within 5 minutes of transmission. By developing automatic algorithms that will identify and classify shocks, ESPs and on- going solar energetic particle events, this warning system will produce estimates of the Earth arrival time of the shock and quantitative predictions/evaluations of the pending increase in radiation hazard with ~30-60 minutes of lead time. This will allow the appropriate precautions to be taken to limit human exposure to the increased radiation hazards and to protect sensitive equipment.

Publication References:

Summary: "

Reference: Forecasting Shocks and Energetic Particle Hazards Using L1 Monitors - Cohen, Christina M. S. CIT