Project Details

ROSES ID: NRA-02-OSS-01
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Program Element: Independent Investigation: LWS

Project Title:
Do we need a multi-spacecraft cluster at L1 for space weather monitoring?

PI Name: Adam Szabo
PI Email: Adam.Szabo@gsfc.nasa.gov
Affiliation: Goddard Space Flight Center
Project Member(s):
- Slavin, James Arthur; COI; Goddard Space Flight Center
- Merka, Jan ; COI; NRC, NASA/GSFC
- Le, Guan ; COI; NASA - Goddard Space Flight Center

Summary:
NOAA has been using L1 solar wind observations from ACE with considerable success to forecast geo-effective events with an approximately 45-minutes warning time. However, there is still a significant level of false alarms and some potentially dangerous events are missed all together. This proposal aims to determine the expected level of increase in forecast accuracy based on multiple solar wind input using already available data from ACE, WIND, IMP 8, Geotail, Interball and Cluster. The first portion of this study will determine the most effective way to combine multi-spacecraft solar wind observations of the triggers of the most geo-effective events. Once the optimal data assimilation method is determined, the increase in geomagnetic activity forecast accuracy would be quantified based on magnetospheric and ground magnetic field data observed by POLAR and the Dst and UCLA magnetometer networks. The benefits of advanced on-board processing of event fronts will be evaluated along with long-term, solar cycle variations in the forecast accuracy. Thus this work will directly contribute towards the development of knowledge of advanced warning capabilities of the most geo-effective events that could place spacecraft and space faring humans at jeopardy, one of the main goals of the NASA LWS program.

Publication References:

Summary: ''

Reference: Szabo, Adam GSFC - Do we need a multi-spacecraft cluster at L1 for space weather monitoring?