

Project Details

ROSES ID: NRA-00-OSS-01

Selection Year: 2001

Program Element: Independent Investigation: LWS

Project Title:

Geospace Environment Variability and Implications for Spacecraft Design and Operation

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Summary:

This proposal comprises two modules. The first is to improve our scientific knowledge of the thermospheric environment conditions and variations over the solar cycle. The work is carried out in three parts: (a) Develop a comprehensive thermospheric database of neutral density variability necessary for validating new EUV proxies, (b) Improve current EUV proxies and upgrade neutral thermosphere response in semi-empirical models, and (c) Evaluate data fusion techniques to increase the specification capability of thermospheric models. The results of this work will significantly advance model descriptions of quantitative relations between the solar EUV spectrum and the response of the thermosphere, and will they permit global density specification to within 3% globally. These results will be directly applicable to satellite drag specification and forecast. The second module is to develop a high-latitude scintillation specification and forecast product. It will predict where irregularities - and hence scintillations - will occur based on tracing forward along convection trajectories the large scale structures and irregularities detected by satellite instrumentation. The needed convection information will be based on a combination of in-situ ion drift measurements, IMF driven global convection patterns, and HF radar measurements. The resultant predictions will be validated by comparing with scintillations observed from ground stations at several high latitude locations. The overall program management and coordination of this proposal will be performed by NASA's Space Environments and Effects (SEE) Program. This Program is customer-driven and product-oriented and is considered a "One-Stop-Shop" for providing environment specification models and effects tools by providing synergy and a seemly transition between modeling the environment and the effects due to the space environments. The SEE Program will manage the environment specification modeling effort of this proposal and coordinate the distribution of its product each year through the SEE website and to the Living With A Star Theory and Modeling Program.

Publication References:

no references