2023 Workshop: Research to Operation

Long title
Improving Space Weather Nowcast and Forecast through R2O2R
Conveners
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Description

The space weather products at NOAA Space Weather Prediction Center (SWPC) are used to provide nowcast and forecast information to our customers in the power grid, communication, navigation, and satellite tracking and operation systems. Multiple ionosphere-thermosphere models and algorithms have been developed within the CEDAR community and are transitioned into operations in order to support SWPC's needs. Working with NASA and other federal partners, it has been identified that improving the research-to-operation (R2O) process is critical to enhancing nowcast and forecast capabilities. NOAA SWPC directly interacts with users and customers to understand their needs and requirements for space environment information. The objectives of the session are to share these requirements with the CEDAR community and explore with the community methods and ways that can advance our current thermosphere and ionosphere services at SWPC. In this session, we will describe NASA's Space Weather Research-to-Operations-to-Research Program Element (R2O2R) and facilitate an open discussion on SWPC's requirements for ionospheric specification and forecasting, ionospheric scintillation, and neutral density.

Agenda

13:30 - 13:45 NASA HQ R2O2R Program Updates

13:45 - 14:00 NRL Updates from Sarah McDonald

14:00 - 14:15 NOAA Updates from Tzu-Wei Fang

14:15 - 15:30 Open discussion in the order of topics below:

(1) Thermospheric density

(2) Ionospheric specification, HF communications

(3) Ionospheric irregularities and scintillation

(4) Other space weather impacts

Justification

CEDAR science addresses the importance of understanding and predicting the dynamic environment in the ionosphere and thermosphere. These have also been emphasized in several CEDAR strategic science thrusts (#1, #2, #3, and #6). However, research efforts to establish predictive models and extend forecast capabilities have not been largely carried out or prioritized. Without being able to properly combine the ground and space measurements to improve our models, the current ability to forecast ionospheric and thermospheric conditions is still rather limited. NASA's R2O2R grant has targeted these needs and provided research funding to the community. The session will provide in-depth discussions of SWPC's immediate goals and what the research community can provide in order to improve the R2O processes and ultimately enhance our capabilities in predicting the upper atmosphere environment.

Related to CEDAR Science Thrusts:
Encourage and undertake a systems perspective of geospace
Explore processes related to geospace evolution
Workshop format
Round Table Discussion
Keywords
Space weather; Research to Operation; Forecast and Nowcast
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