2024 Workshop: Data sciences for whole atmosphere models

Long title
Community engagement on data science for an integrated system from the ground into geospace
Conveners
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Description

This session invites presentations with focus on numerical simulations and integrations of atmospheric and ionospheric observations from the ground into geospace. The use of emerging data science techniques to better leverage existing observational and modeled data will be discussed. This workshop calls on synergy between state-of-the-art models and data sciences to advance the prediction capability and the physical understanding of the whole atmosphere and ionosphere system. Presentations including theoretical work, data analysis, and instrument development are also encouraged.

Agenda

Monday, 16:00-18:00, Harborside

17:00-17:20 Nick Dietrich, *Specifying the upper atmosphere through data assimilation of radio occultation observations*

17:20-17:40 Jiahui Hu, *Data assimilation of ion drift measurements for estimation of ionospheric plasma drivers*

17:40-17:50 Andrew (Wonseok) Lee, *Impact of lower atmosphere forecast errors on ionospheric conditions during geomagnetic storms using WACCM-X*

17:50-18:00 Min-Yang Chou, *Ionospheric model validation during the 2021 November storm: foF2 validation using the FORMOSAT-7/COSMIC-2 data*

Justification

The Space Atmosphere Interaction Region (SAIR) is a crucial environment where space weather effects impact our technology and society, and where influences from solar wind and magnetosphere interact strongly with the lower atmosphere forcing. Yet observational measurements of various atmospheric and ionospheric properties throughout SAIR do not exist. The complex interactions and underlying processes for driving the dramatic SAIR variability are still poorly understood. To gain new insights, this session calls for community discussions on applications of data sciences in whole atmosphere and ionosphere models. Leveraging available observations with state-of-the-art models is a vital step towards the prediction and the physical understanding of the SAIR system.

Related to CEDAR Science Thrusts:
Encourage and undertake a systems perspective of geospace
Develop observational and instrumentation strategies for geospace system studies
Fuse the knowledge base across disciplines in the geosciences
Manage, mine, and manipulate geoscience/geospace data and models
Include a virtual component?
Yes
Keywords
Whole atmosphere models, data assimilation, data science, SAIR
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