2019 Workshop: GEM CEDAR High Lat Modeling Challenge

Long title
GEM-CEDAR Modeling Challenge: Conductivities and High-Latitude Ionosphere-Thermosphere Coupling
Conveners
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Description

We will focus on validation of Auroral precipitation and high latitude ionosphere electrodynamics and Neutral Density and Orbit Determination at LEO for the events selected by the GEM Conductance Challenge, AuroraPHILES, and Neutral Density teams.

The events for AuroraPHILES and the GEM Conductance Challenge are:

- 2016 Oct 13-15
- 2013 March 17
- 2015 Jun 21-24
- 2012 March 9

Time permitting, we will have additional discussion of how to make the most of the Whole Heliosphere and Planetary Interactions Campaigns for these challenges.

Agenda

Speakers will each have 10 minutes, followed by 5 minutes for discussion.

The primary focus for this session will be the 17 March 2013 event. Ionospheric data should focus on precipitation observations (energies, time variabilities, and 2D morphology) and conductivities. Ionospheric models should focus on signatures of heating (NmF2, hmF2).

- Steve Kaeppler -- *PFISR data*
- Yongliang Zhang -- *DMSP SSUSI data-derived precipitation and conductance*
- Dan Weimer -- *Exosphere temperature and density modeling*
- Mihail Codrescu -- *CITPe modeling*
- Gang Lu -- *AMIE and TIEGCM modeling*
- Xing Meng -- *SWMF-GITM modeling*

Following the speakers, we will discuss next steps for the high latitude challenges, including model-data comparisons, collaboration with GEM activities, and additional events.

Justification

Ionosphere/thermosphere and geospace research relies on numerical simulations for context, understanding, and prediction. In recognition that model validation is a challenging research task requiring collaborative use of data and models across physical and spatial regimes, the CEDAR and GEM communities initiated community wide model validation activities: GEM GGCM (in 2008) and CEDAR Electrodynamics Thermosphere Ionosphere (in 2009) Model Validation Challenges. The GEM-CEDAR Model Validation Challenge, built upon the GEM GGCM and CEDAR ETI Challenges, was initiated during a previous Joint GEM-CEDAR Workshop in 2011. The GEM-CEDAR Challenge focuses on physical parameters, spatial domains, and aspects of model validation of interest to both communities. This session focuses on validation of high-latitude magnetosphere-ionosphere-thermosphere coupling, with direct tie-ins to the GEM Conductance Challenge and the "International Forum for Space Weather Capabilities Assessment" teams for Auroral Region and Neutral Density.

This workshop will address CEDAR Strategic Thrust #5 as the workshop will facilitate collaboration among modelers, data providers and research communities in order to address the differences between various modeling approaches, to track model improvements over time, and to provide feedback for further model improvement.

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