2018 Workshop: High latitude system challenges

Long title
Challenges in high-latitude system dynamics
Conveners
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Description

The high-latitude region continues to challenge our fundamental understanding of magnetosphere-ionosphere-thermosphere (MIT) system science. Examples of outstanding challenges include the variable responses to solar wind driving in the auroral zones, polar cap and cusp, each of which has been shown to exhibit phenomenology not captured in the established paradigm of solar wind-MIT coupling. Recent observations of energy deposition and dissipation have raised new challenges in understanding coupling and energy transport across multi-scales. The impact of these observations has not been explored but they can potentially bring a paradigm change to our understanding of the high-latitude dynamics and MIT coupling, and modeling efforts are currently under way. The focus of the Workshop will be on dynamic and cross-scale processes at transition regions of the MIT in a system-wide approach. We invite discussions on satellite, rocket and ground-based observations, and innovative modeling of the coupling processes in the high-latitude regions.

Justification

The Workshop’s strategic approach is aligned with the major CEDAR strategic thrust #2. We specifically target the Mission: “To understand the transformation and exchange of mass, momentum and energy at transitions within the ITM and through boundaries that connect with the lower atmosphere and the magnetosphere” and its suggested Implementation: “Advance theories and coupled models that account for processes at transitions and across boundaries”

We will promote broad, interdisciplinary participation (CEDAR strategic thrust #5) and will coordinate our workshop with the GEM Focus Group “3D Ionospheric Electrodynamics and its Impact on the Magnetosphere-Ionosphere-Thermosphere Coupled System”(pdf), by agreement with the GEM FG primary chair, Prof. Hyunju Connor.

We pose a series of focused questions to be addressed in this workshop: • How do the different high-latitude regions respond to steady vs dynamic energy input? • What is the role of mesoscale structuring at high latitudes in the MIT response to solar wind driving? • What is the role of dynamic variability in MIT coupling and energy/momentum exchange?

Summary

LInk to shared slides (pdf)

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