2025 Workshop: MESO-KiTS-CEDAR

Long title
Magnetotail and Ionosphere Structure and Dynamics Inferred from Low-Altitude and Ground-Based Observations
CEDAR-GEM
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Description

The nightside magnetosphere, or magnetotail, hosts a diverse range of transient mesoscale phenomena, including plasma flows, field-aligned currents, Alfvén waves, thin current sheets, and dipolarization fronts, among others. These dynamic processes are effectively studied using ground-based and low-altitude observations of magnetic field perturbations and energetic particle precipitation into the aurora. Such observations provide a powerful tool for remotely monitoring magnetotail dynamics and assessing their broader impact on the ionosphere and atmosphere. A comprehensive understanding of these transient events requires the integration of insights from both magnetospheric and aeronomy perspectives. Our session aims to foster collaboration between researchers working with low-altitude and ground-based observations, magnetotail modelers and theoreticians, and those analyzing equatorial spacecraft data. Additionally, we seek contributions from ionospheric and atmospheric modelers to help bridge observational gaps and refine methodologies for tracking magnetotail transients.

Justification

This proposed workshop is highly relevant to both the GEM and CEDAR communities. Our goal is to address the key scientific question: How can we develop methods to

monitor magnetotail transients from low-altitude/ground-based observatories and model their impact on the nightside Earth’s ionosphere? To advance toward answering this question, the session will feature short contributed and invited presentations designed to spark discussion within the community. The joint nature of the meeting provides an ideal venue for these debates, fostering discussions between researchers from different areas and facilitating both ongoing and new collaborations.

Related to CEDAR Science Thrusts:
Encourage and undertake a systems perspective of geospace
Explore exchange processes at boundaries and transitions in geospace
Explore processes related to geospace evolution
Develop observational and instrumentation strategies for geospace system studies
Fuse the knowledge base across disciplines in the geosciences
Workshop format
Short Presentations
Include a virtual component?
Yes
Keywords
Magnetotail Structure, Magnetosphere-Ionosphere Coupling
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