2014 Workshop: Subauroral Geospace

Long title
Grand Challenge: Storm/substorm-time subauroral Geospace
Grand Challenge
Conveners
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Description

The objective of this workshop is to make an assessment of a wide range of plasma and wave processes that control the dynamics/structure of the inner magnetosphere/subauroral ionosphere (subauroral geospace) near/earthward the electron plasma sheet boundary. Possible topics of discussion will include (but are not limited to): What is the role of nonlinear plasma processes in the formation of SAID/SAPS and interaction of substorm injections with the plasmasphere? How significant is coupling to magnetotail/aurora? Is there a direct link between the erosion plume and SAPS with dayside reconnection/cusp? What is the role of M-I coupling processes in the SAPS/SAID formation and evolution? What are the fast timescale drivers of the ring current and SAPS? What is the role of cross-scale coupling within the subauroral M-I system? What evidence is there for direct injection of ionospheric ions into the ring current in the plasmasphere boundary layer? Invited/solicited speakers will summarize recent progress in satellite and ground-based observations and theory/modeling of sub-auroral processes and discuss future directions of research to advance better understanding of subauroral geospace physics.

Justification

The subauroral geospace is among significant contributors to space weather. Among the key drivers of subauroral geospace dynamics at both large and small scales are hot plasma jets injected from the near/mid-tail merging regions and nonlinear coupling processes such as ionospheric feedback instability. Although discussed in

previous workshops, these questions remain of great interest for the CEDAR community. Recent satellite and ground-based observations demonstrated that a dramatic re-evaluation of our understanding of the development of the subauroral geospace disturbances is overdue and would require a sustained basic research effort. Their investigations are essential to the success of the system-wide research effort targeted by the new CEDAR Strategic Plan. This workshop will bring to bear satellite, radar, and optical observers and geospace modelers to address basic processes that control the dynamics of the perturbed subauroral geospace and its coupling with magnetotail and magnetopause.

The subauroral geospace is among significant contributors to space weather. Its substorm/storm dynamics remains of great interest for the CEDAR community for many years. Recent satellite and ground-based observations demonstrated that a dramatic re-evaluation of our understanding of the development of the subauroral geospace disturbances is overdue. Advancing the understanding of basic processes that control the dynamics of the perturbed subauroral geospace and its coupling with magnetotail and magnetopause would require a sustained basic research effort of satellite, radar, and optical observers and geospace modelers. These investigations are essential to the success of the system-wide research effort targeted by the new CEDAR Strategic Plan. Therefore, we believe that this workshop should be a multi-year event.

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