2011 Workshop: Modeling Ionospheric Outflow

Long title
Modeling Ionospheric Outflow
CEDAR-GEM
Conveners
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Description

There is a continuous ion outflow from the Earth at high latitudes. The outflow consists of light thermal ions (H+ , He+ and O+) and energized ions (NO+, O2+, N2+, O+, N+, He+ and H+). The ion energization in the polar wind is associated with photoelectrons, hot magnetosphere electrons and ions, wave-particle interactions in the cusp and nocturnal oval at various altitudes, electromagnetic wave turbulence above the polar cap, and centrifugal acceleration. In addition, the ion outflow occurs in conjunction with magnetospheric convection, which causes the high-latitude plasma to drift into and out of the dayside ionosphere, cusp, polar cap, nocturnal auroral oval, and subauroral night-side ionosphere. Because of the complicated dynamics, various ion outflow models have been developed, including hydrodynamic (fluid), hydromagnetic, semi-kinetic, kinetic, generalized transport, and macroscopic particle-in-cell models. This workshop will identify the ionospheric outflow models that currently exist, establish the strengths and limitations of existing models, and determine the important outflow processes that need to be included in outflow models.

Justification

This workshop will be an important element of the new GEM Focus Group on The Ionospheric Source of Magnetospheric Plasma. It is one of a set of workshops that are being proposed for the CEDAR-GEM meeting in order to kick-off this new area of study.

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