2018 Workshop: Thermosphere Disturbances

Long title
High Latitude Thermosphere Disturbances and Their Global Impact
Conveners
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Description

This workshop provides a forum for the community to discuss progress and issues concerning the auroral region ionosphere and thermosphere and their coupling, and to promote collaborations among interested investigators and institutes.

Justification

We focus on the structures and disturbances in the high latitude thermosphere and their impact on global thermosphere and ionosphere.

It is well recognized that storm-time disturbances in the global Ionosphere-Thermosphere (IT) are caused by energy and momentum inputs at high latitudes which alter and redistribute the neutral density and composition globally. For example, high latitude heating leads to the storm-time depletion in the thermospheric O/N2 density ratio that produce negative ionospheric storms. On the other hand, auroral particles produce enhanced and excited nitric oxide (NO) molecules which, like O/N2 depletion, are originated at high latitudes and then redistributed globally. The enhanced NO cools the thermosphere through IR radiation. However, the paucity of measurements of the high latitude thermosphere hinders the progress in our understanding and our ability to predict the storm-time thermospheric response and recovery processes.

Over the past decades, many advanced techniques (such as incoherent scatter radar, FUV spectrographic imaging, GPS, etc.) provide a way to monitor the IT conditions in the high latitude (the polar cap and auroral oval) region with better temporal and/or spatial resolution. It is now the time for a concerted effort to better understand the processes in the high latitude thermosphere that play a key role in producing global IT disturbances, and to develop a comprehensive picture of the high latitude inputs and the associated thermospheric structures as well as ionospheric conditions using new measurements and advanced models.

This workshop directly supports the ‘system science’ paradigm described in the CEDAR strategic plan and the 2013 Heliophysics decadal survey.

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