2022 Workshop: Storm and Non-storm time Thermosphere and Ionosphere

Long title
Dynamics of the Thermosphere-ionosphere System During Geomagnetic Storms and Non-storms
Conveners
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Description

The ionosphere-thermosphere (I-T) system is controlled by complicated chemical and physical processes that vary greatly with external forcing and internal dynamics. This variability becomes much stronger during storms, when the interaction between the solar wind and geospace produces significant energy and momentum inputs to the system, changing high latitude composition, winds and temperature. These storm-time, high-latitude perturbations are then transmitted to middle and low latitudes, through non-linear dynamics and electrodynamics, such as penetration electric fields, disturbance dynamo, traveling atmosphere/ionosphere disturbances (TADs/TIDs), changing global neutral and plasma densities and producing structures of different spatial and temporal scales. On the other hand, the IT system also shows noticeable changes during none-storm periods with low geomagnetic activities. This session welcomes presentations of both observations and modeling on the dynamic changes of the I-T system.

Agenda

10:00-10:15 **Deepak Karan**: Effects of 2020 September Geomagnetic Storms in the Nighttime Equatorial Ionization Anomaly (EIA) and EPBs as Observed by the GOLD Mission

10:15-10:30 **Mack Jones:** Understanding nighttime ionospheric depletions associated with sudden stratospheric warmings in the American sector

10:30-10:45 **Manbharat Dhadly**: TAD/TIDs

10:45-11:00 **Chaosong Huang:** Ionospheric response to 20 Nov 2003 storm.

11:00-11:15 **Xuguang Cai** (presented by Liying Qian): Nighttime Dynamics and Electrodynamics Revealed by the EIA Observed by GOLD.

11:15-11:30 **Onyinye Nwankwo**: Investigating the impact of geomagnetic storm over the ionosphere-thermosphere system of subauroral/midlatitude region using ISR observations and GOCE measurements

11:30-11:45 **Qingyu Zhu**: Impact of soft electron precipitation on the thermospheric neutral density during geomagnetic storms.

11:45-12:00 Wenbin Wang: High-Resolution Whole Geospace Modeling of Mesoscale Processes

Justification

Recent developments in magnetosphere-ionosphere-thermosphere coupled model provide a new opportunity to explore the solar and geomagnetic effect on the ionosphere and thermosphere. In addition, NASA GOLD, ICON, and NOAA COSMIC 2 mission offer great coverage in the equatorial region to facilitate the validation model simulation and can lead to discovery of new connection between the different regions of the upper atmosphere and magnetosphere. This workshop showcase the recent progress in these areas.

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