2019 Workshop: Geospace Storm

Long title
Geospace storms and ionosphere-thermosphere-lower atmosphere coupling phenomena and processes
Conveners
Shunrong Zhang
Wenbin Wang
Description

This session provides a forum to discuss advances in understanding the fundamental responses of the ionosphere, thermosphere and lower atmosphere system to geospace storms and physical processes leading to these changes. We welcome contributions that address thermospheric dynamical and chemical changes in the neutral wind and composition, ionospheric electrodynamic variations at high, subauroral, and equatorial latitudes, disturbance wind dynamo and penetration electric fields, traveling atmospheric disturbances and traveling ionospheric disturbances, energetic particular precipitation and effects on the low atmosphere, etc. Identifying relative roles of these processes in determining the upper atmospheric storm-time behavior is most relevant to this session. Relatively new events based on multiple instrumentations from the ground and in space as well as theoretical models are well suited for the session; extreme events and statistical studies are also welcome.

Agenda

Wednesday (10-12AM @ Mesa A/Hilton)

10:00—10:14 **Chaosong Huang** Long-lasting penetration electric fields during geomagnetic storms

10:15—10:29: **Iurii Cherniak** GNSS spotlight on storm-induced ionospheric disturbances at middle and low latitudes

10:30—10:44 **Quan Gan / Richard Eastes** Geomagnetic Storm Effect on the OI 135.6 nm Airglow in the Middle Thermosphere: First Look from the GOLD Mission

10:45—10:59 **Nick Pedatella** Role of lower atmosphere variability in the ionosphere response to geomagnetic storms

11:00—11:14 **Yongliang Zhang** and Larry Paxton, Observations of thermospheric composition and temperature

11:15—11:29 **Anthea Coster** SED/TOI events in the Arctic and Antarctic during Solar Cycle 24

11:30—11:44 **Nathaniel Frissell** High-Frequency Communications Response to Solar Activity in September 2017 as Observed by Amateur Radio Networks

11:45—11:59 **Rodger Varney** (May 10-16, 2019 CME)

Thursday (10-12AM @Mesa A/Hilton)

10:00—10:14 **Joe Huba**

10:15—10:29 **Tzu-Wei Fang** (Michigan Geospace Model + the Whole Atmosphere and Ionosphere models during storm times)

10:30—10:44 **Ercha A** (Super equatorial plasma bubble events during September 2017 geospace storms)

10:45—10:59 **Shasha Zou** (September 2017 geospace storms)

11:00— 11:09 **Carlos Martins** SAR arcs on 27 Sep. 2017

11:10—11:24 **Shunrong Zhang** (Subauroral dynamics and TIDs during September 2017 geospace storms)

11:25—11:39 **Liying Qian** (September 2017 flare and storm simulations)

11:40—11:54 **Brian Anderson** J. W. Gjerloev, et al., Characteristics of Storm-time Current Wedges and Electrojets Following Night-side Birkeland Current Onsets

11:55—12:04 **Shikha Raizada** Aug 2011 storm

Justification

Geospace storms are caused by space disturbance conditions originated primarily from the sun in the form of coronal mass ejections (CMEs) and solar wind high speed streams (HSSs). Geospace storms are characterized with CME sources during high

solar activity periods while HSS events are typical disturbance sources during low solar activity periods. Storms are known to generate fundamental changes in the geospace system, particularly, in the ionosphere and thermosphere and sometimes in the lower atmosphere. Strong nonlinear coupling and feedback processes take place and shape the large variability of system responses to storms, however, the exact physical processes during a given event and, in particular, the relative roles of them remain inadequately understood. This session will address some of these challenging questions. The general topic area of this session is related to the storm-time coupled SAIR (Space Atmosphere Interaction Region), the target area of the CEDAR science, and has significant community interests. The proposed workshop addresses the CEDAR Strategic Thrust #2: Explore Exchange Processes at Interfaces and Boundaries.

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