2023 Workshop: Equatorial Ionization Anomaly (EIA) and ionospheric irregularities

Long title
Recent advances in the understanding of Equatorial Ionization Anomaly (EIA) and ionospheric irregularities (e.g., Scintillations, Equatorial Plasma Bubbles, Spread-F) over low and mid latitudes using ground and satellite measurements and modelling studies
Conveners
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Description

Note: this workshop will be "Recent advances in the understanding of Equatorial Ionization Anomaly (EIA) and ionospheric irregularities, part 1" in 2023 CEDAR Workshop agenda due to a merging with another proposed workshop.

This session invites presentations related to space and ground-based measurements and modeling efforts that contribute to a better understanding of the development and variability of EIA and ionospheric irregularities (e.g., Scintillations, Equatorial Plasma Bubbles, Spread-F) over low and mid-latitudes.

Agenda

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Join Zoom Meeting
https://cuboulder.zoom.us/j/9326582431
Meeting ID: 932 658 2431

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1. [10:00 to 10:09 AM] - **Richard Eastes**

Title: "Improving Prediction of the Equatorial Ionization Anomaly’s Peak Density and Latitude"

[10:09 to 10:12 AM] - Discussion

2. [10:12 to 10:21 AM] - **Xuguang Cai**

Title: "Equatorial Ionization Anomaly Discontinuity Observed by GOLD, COSMIC-2, and Ground-Based GPS Receivers' Network"

[10:21 to 10:24 AM] - Discussion

3. [10:24 to 10:33 AM] - **Kun Wu**

Title: "Investigation of the GOLD observed Merged Nighttime EIA with WACCM-X Simulations during a storm"

[10:33 to 10:36 AM] - Discussion

4. [10:36 to 10:45 AM] - **Anastatia Newheart**

Title: "The Effect of Prompt Penetration Electric Fields on Plasma Bubble Growth Rates"

[10:45 to 10:48 AM] - Discussion

5. [10:48 to 10:57 AM] - **Joe Huba**

Title: "Modeling the Development of an Equatorial Plasma Bubble during a Midnight Temperature Maximum with SAMI3/WACCM-X"

[10:57 to 11:00 AM] - Discussion

6. [11:00 to 11:09 AM] - **Qian Wu**

Title: "GOLD observations of bubbles and COSMIC 2 geolocation of scintillations"

[11:09 to 11:12 AM] - Discussion

7. [11:12 to 11:21 AM] - **Shantanab Debchoudhury**

Title: "Multi-layer observations of plasma blobs and bubbles using ICON, GOLD and ISS FPMU"

[11:21 to 11:24 AM] - Discussion

8. [11:24 to 11:33 AM] - **David Knudsen**

Title: "Swarm-based evidence of significant EPB structure parallel to B"

[11:33 to 11:36 AM] - Discussion

9. [11:36 to 11:45 AM] - **Ercha Aa**

Title: "A new Bubble Index and multi-day periodicity of EPBs from GOLD observations"

[11:45 to 11:48 AM] - Discussion

10. [11:48 to 11:53 AM] - **Zihan Wang**

Title: "Simulation of super bubbles during Sep 7, 2017 storm with GITM-SAMI3"

[11:53 to 11:55 AM] - Discussion

[11:55 to 12:00 AM] - **Concluding Remarks**

Justification

Equatorial Ionization Anomaly (EIA) and ionospheric irregularities (e.g., Scintillations, Equatorial Plasma Bubbles, Spread-F) have been a major focus of the low and mid-latitude ionospheric research community. The behavior of the IT system is influenced by the solar forcing from above, wave activities from below, traveling atmospheric/ionospheric disturbances (TADs/TIDs) from mid/high latitudes, and the equatorial dynamo process. These factors along with the dynamic processes manifest various thermospheric and ionospheric irregularities (e.g., Scintillations, Equatorial Plasma Bubbles, Spread-F). Further, the geometry (such as magnetic declination angle, terminator alignment), geomagnetic activities, and other conditions (e.g. winds and wave activity) regulate the morphology and variability. Determining these conditions and understanding their interactions have challenged the research community for decades. New and existing satellite measurements (GOLD, ICON, COSMIC), ground-based observations (e.g., GNSS TEC, incoherent/coherent scatter radar, all-sky imagers, ionosonde), and modeling approaches have revealed several new, interesting characteristics about the EIA variability and ionospheric irregularities.

Related to CEDAR Science Thrusts:
Explore processes related to geospace evolution
Develop observational and instrumentation strategies for geospace system studies
Workshop format
Short Presentations
Keywords
Equatorial Ionization Anomaly, Plasma Irregularities, Thermospheric-Ionospheric Coupling,Observations and Modelings
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