

Technical Page

Proposal Type: Regular
 General Category: Terrestrial Aeronomy
 Sub-Category: Radar
 Observation Category: Thermosphere
 Total Time Requested: 96 Hours
 Minimum Useful Time: 4 hours starting at sunset

Proposal Title: Characterizing the Electrodynamics within Medium-Scale Traveling Ionospheric Disturbances

ABSTRACT:

Medium-scale traveling ionospheric disturbances (MSTIDs) have been observed over Arecibo during the last decade using the incoherent scatter radar (ISR) and facility passive optical instruments. One of the limitations of these past studies has been that most of the structures observed extend out of the field of view of the Arecibo facility imaging system. New instrumentation (two imagers, two dual-frequency GPS receivers) is currently being deployed in the southern Caribbean to address this limitation. We propose to make measurements of the properties of MSTIDs with the ISR (electron densities, electric fields), 630.0-nm Fabry-Perot interferometer (thermospheric neutral winds), and facility imaging system in conjunction with this new instrumentation. With these measurements, we will (a) better characterize the electrodynamic nature of MSTIDs seen in the imagers, (b) study of the background conditions conducive to MSTID development, and (c) characterize the effects these structures can have on trans-ionospheric radio wave propagation.

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Remote Observing Request

- Observer will travel to AO
- Remote Observing
- In Absentia (instructions to operator)

Instrument Setup

430 G 430 CH receiver 430 CH radar

Atmospheric Observation Instruments:

Fabry-Perot Ionosonde

Description of Observer Equipment: Instrumentation (GPS, imager) will be located off site (in southern Caribbean) to complement the facility instrumentation.

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned