

Technical Page

Proposal Type: Regular
 General Category: Terrestrial Aeronomy
 Sub-Category: Radar
 Observation Category: Thermosphere
 Total Time Requested: 36 Hours
 Minimum Useful Time: 9 hours

Proposal Title: Simultaneous Neutral Wind and High-Resolution Acoustic Gravity Waves Measurements at Arecibo

ABSTRACT:

Recently it has become evident that a background of AGWs is continuously present in the Arecibo thermosphere [e.g., Djuth et al., 2010; Djuth et al., 2004]. Very high-resolution electron density measurements obtained by applying the coded long-pulse (CLP) radar technique to photoelectron-enhanced Langmuir waves has allowed us to make very detailed measurements of the Arecibo gravity waves. The nominal apparent period of the AGWs is 50-60 min at 240-250 km altitude. Apparent periods of 20-30 min are also evident at lower altitudes (below about 170 km altitude). In addition, small oscillations having periods near the Brunt-Vaisala period are observed below about 220 km altitude. The focus of the proposed observation is on making simultaneous CLP observations along with radar measurements of background neutral winds so that intrinsic periods can be deduced. Other phenomena that benefit from the neutral wind study include the secular increase in the period above 145 km during the morning and the change between 165 and 235 km altitude from morning to afternoon. Finally, as part of the observing program we plan to add to our limited radar database involving the direction-of-arrival of the Arecibo AGWs.

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Remote Observing Request

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

Instrument Setup

430 CH radar

Atmospheric Observation Instruments:

Ionosonde

Special Equipment or setup: The proposal calls for simultaneous radar transmissions from both the line feed and Gregorian feed.

RFI Considerations

Frequency Ranges Planned