

Technical Page

This proposal has not been submitted before.

Proposal Type: Regular
 General Category: Astronomy
 Sub-Category: Radar
 Observation Category: HF heating
 Total Time Requested: 60 Hours
 Minimum Useful Time: 4 hours

Proposal Title: Stimulated Electromagnetic Emission Experiments Designed for the Arecibo HF Facility

ABSTRACT:

Two Stimulated Electromagnetic Emission (SEE) studies are proposed that entail use of the Arecibo Observatory (AO) HF facility. These include magnetized stimulated Brillouin scattering (MSBS) from sporadic E and the lower F region and the two plasmon decay (TPD), which entails the decay of the linearly polarized HF pump wave into two Langmuir waves having half the HF frequency. The principal diagnostics are a wideband (1 MHz) digital HF receiver with high dynamic range and the Arecibo 430 MHz radar. In the past, MSBS has been observed in blanketing sporadic E, Esb, and the F region by F. T. Djuth and L. D. Zhang. The current focus is to use MSBS as an ion mass spectrometer to extend the current ion composition database in Esb and add altitudes between 130 km and 200 km so that the relative proportion of O²⁺, O⁺ and NO⁺ can be determined.

Name	Institution	E-mail	Phone	Student
Frank T Djuth	Geospace Research, Inc.	fdjuth@geospace-research.com	310-727-9528	no

Remote Observing Request

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

Instrument Setup

430 CH receiver 430 Xmit

Atmospheric Observation Instruments:

Ionosonde

Description of Observer Equipment: F. T. Djuth will supply an HF digital receiver having high dynamic range. It will not be deployed at Arecibo Observatory. If feasible it will be deployed on Nevis for the TPD experiment. For the MSBS experiment it will be deployed at a TBD site in Puerto Rico.
Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

422 MHz - 440 MHz