

Technical Page

This proposal has not been submitted before.

Proposal Type: Regular
 General Category: Astronomy
 Sub-Category: Radar
 Observation Category: High Power HF
 Total Time Requested: 40 Hours
 Minimum Useful Time: 6 hours

Proposal Title: Altitude Resolved Stimulated Electromagnetic Emissions (ARSEE) Using Chirp HF Transmissions

ABSTRACT:

The objective is to better understand high power radio wave interactions produce stimulated electromagnetic emissions (SEE) by parametric excitation of plasma waves a using high power HF wave as a pump. The ionospheric interaction altitude changes with the excitation of the daughter waves of the parametric process. The Chirp HF Transmission technique is designed to determine the SEE spectrum as a function of altitude. The 5.1 and 8.175 MHz HF transmissions will be modulated using a waveform generator to produce 20 kHz frequency modulation ramps centered at the transmission frequency. With a wave from repletion frequency of 200 Hz, the frequency modulated continuous wave (FMCW) singles will be processed to give 12 km resolution for the emission region altitude with 200 Hz bandwidth ambiguity. This technique will resolve the source regions for generated electrostatic waves (Langmuir, Upper-Hybrid, Electron Ion Cyclotron) and electromagnetic waves pumped by the high power HF.

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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 Xmit

Atmospheric Observation Instruments:

Tilt-Photometer

Description of Observer Equipment: Boston University and SSI Imagers

Special Equipment or setup: HF Facility with User-Supplied Chirp Generator 430 Incoherent Scatter Radar CCD Cameras (BU, Penn State) Ground HF Antenna Setup at Camuy, PR

RFI Considerations

Frequency Ranges Planned

5.1 MHz

8.175 MHz