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:	38 Hours
Minimum Useful Time:	4 hours day, 6 hours night

Proposal Title: Altitude-resolved spectra of plasma turbulence in filamentary structures excited with the new Arecibo HF facility

ABSTRACT:

High-resolution 430 MHz spectral observations made with the new HF facility in November 2015 show that Langmuir turbulence in HF-induced filamentary structures is layered and that the number of layers is dependent on the time period that the HF beam is on. Most likely these layers correspond to direct parametric decay into discrete ducted wave modes in the plasma [Mjolhus et al., 2001]. The ducts have small scales across the geomagnetic field lines B (less than 15 to 20 m) and exist within field-aligned filamentary structures that are nominally 500 m to 1 km perpendicular to B. Our current results represent spin-off science from a suprathermal electron project. We propose to greatly extend our understanding of the wave-duct process through the use of a variety of different HF pulsing sequences, HF power stepping, and by scanning a wide range of viewing angles relative to the ducts (37 to 51 degrees).

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Remote Observing Request

[X]	Observer will travel to AO
[ ]	Remote Observing
[ ]	In Absentia (instructions to operator)

Instrument Setup

430 CH receiver 430 Xmit

Atmospheric Observation Instruments:

Ionosonde

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

425 MHz - 442 MHz