Proposal Identification No.: T2877 Date Received: 2013-Sep-03_10:44:05

Technical Page

This proposal has not been submitted before.

Proposal Type:	Regular
General Category:	Terrestrial Aeronomy
Sub-Category:	Continuum
Sub-Category:	Radar
Observation Category:	Thermosphere
Total Time Requested:	16 Hours
Minimum Useful Time:	

Proposal Title: Optical manifestations in the upper atmosphere during High Frequency (HF) heating campaign at Arecibo Observatory

ABSTRACT:

The new HF heating facility with the ISR (Incoherent Scatter Radar) and other instruments provides a unique opportunity to study heating related aeronomic and plasma physics problems. This includes very sensitive rapidly-imaged, high horizontal- and time-resolution imaging of airglow at 557.7 nm, 630.0 nm and 427.8 nm during ionospheric "heating" to understand the role of HF-heating in generating plasma bubbles, or modulating them if already present, and to understand the role of secondary suprathermal electrons in producing airglow at different wavelengths, if any. This research will also yield insight to the heating processes including locating ionospheric "hot-spots", yielding details of the electron collision process, elucidating the role of Langmuir and ion-acoustic waves in the strongly heated regions, and study of heating effects in Sporadic E. The latter study will include Ca+ metal-lidar observations as further defined by 555.7 nm imaging as well as ISR and HF radar results.

Name	Institution	E-mail	Phone	Student
Sumanta Sarkhel	The Pennsyvania State University	sus54@psu.edu		no

Remote Observing Request

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

Instrument Setup

430 Xmit Heating Facility

Atmospheric Observation Instruments:

Tilt-Photometer Spectrophotometer Fabry-Perot Ionosonde Lidar

Description of Observer Equipment: Allsky Airglow Imager

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned