Proposal Identification No.: H3110 Date Received: 2016-Aug-11_19:50:37

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:	76 Hours
Minimum Useful Time:	12 hours

Proposal Title: Atmospheric N2 and O Measured via the Quenching of HF excited O(1D)

ABSTRACT:

The thermospheric neutral density [O, O2, N2] with emphasis in the lower thermosphere will be measured using the quenching time constant of O(1D) excited by HF accelerated suprathermal electrons. This will be complimented by neutral density dependencies on other optical emissions. In a companion AO proposal we propose an HF facility daytime solution to determine bottom-side atomic to molecular ion composition. Here we propose a nighttime complimentary dovetailed innovation based on optical emission signatures of neutral density: excitation and quenching dependent on O and N2. For the first time, we propose to use the HF facility as an inexpensive electron gun firing HF-accelerated suprathermal electrons into the thermosphere to excite optical emissions. Relative penetration depths extracted from ASIP images [557.7, 427.8, 777.4, 630.0 nm] will be used to [as illustrated in Carlson and Jensen, 2014] to both: construct altitude dependent images of penetration depth, and evaluate

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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:

Tilt-Photometer Fabry-Perot Ionosonde

Description of Observer Equipment: All Sky Imaging Photometer (ASIP)

Special Equipment or setup: All of the above instruments are needed for each run.

RFI Considerations

Frequency Ranges Planned