Technical Page

Proposal Type: Regular
General Category: Terrestrial Aeronomy
Sub-Category: Radar
Observation Category: Exosphere
Total Time Requested: 264 Hours

Proposal Title: Coupling of the Neutral Thermosphere, Exosphere, and Topside-Ionosphere

ABSTRACT:
The general object is to quantify the abundance and dynamics of light neutral and light ion species in the upper atmosphere at solar maximum, and to understand their chemical interactions relative to solar minimum. Specifically, we propose to: 1) Quantify the population of H atoms on escaping trajectories within the H velocity distribution. 2) Correlate H velocity distribution distortions from Maxwellian as a function of H+ composition. 3) Evaluate He+ recombination as a source of metastable helium, relative to photoelectron (PE) production. 4) Determine exobase winds using measurements of the Doppler shifted, infrared, He emission. 5) Determine vertical winds above the F2 peak using the Doppler shift of the OI 844.6 nm emission. 6) Characterize the interhemispheric flow of PE by simultaneous OI measurements in Chile. An over-arching objective is expansion of an H abundance data-base to evaluate predictions of secular H enhancement expected as a consequence of global change in atmospheric hydrogenous composition - primarily due to methane deposition at the earth surface.

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I do NOT want to do remote observing.

Instrument Setup

430 CH receiver  430 CH radar

Atmospheric Optical Instruments:
Tilt-Photometer  Fabry-Perot  Ionosonde

Description of Observer Equipment: Infrared Fabry-Perot interferometer

Special Equipment or setup: Experiment requires two Observatory Fabry-Perot interferometers, and two photometers.

RFI Considerations

Frequency Ranges Planned

425 - 435 MHz

This proposal requires coordination with AFTWF within the band 425-435 MHz.