

## Technical Page

Proposal Type: Long-term  
 General Category: Terrestrial Aeronomy  
 Sub-Category: Radar  
 Observation Category: Exosphere  
 Total Time Requested: 240 Hours

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

The science objective is to illuminate the processes that govern the composition and dynamics of the coupled thermosphere-exosphere-ionosphere system. One central objective is evaluate and quantify possible long-term study global climate change by sampling of hydrogen abundance near 500 km, as has been done with consistent calibration since 1983. A second objective is to characterize the response of H and photoelectrons to magnetic storms, and to do so with the additional support of instruments along a common meridian at Jicamarca Peru, and at the CTIO, in Chile. A third objective is to prove an apparent correlation between charge-exchange induced H velocity distribution perturbations and the abundance and flow of protons in the topside ionosphere. This scope of this objective includes an assesment of the escape flux mechanism budget as a function of solar cycle. Preliminary evidence is that charge escape induced escape dominates when H+/O+ transition descends to near 500 km. The final objective is to establish a low-error technique to measure exobase temperature and winds using IR helium emissions.

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### Service Observing Request

- None
- All of the observing run.
- Part of the observing run.
- Queue Observing

### Remote Observing Request

- No
- Maybe
- Yes

### Instrument Setup

430 G                      430 CH receiver    430 CH radar

#### Atmospheric Observation Instruments:

Tilt-Photometer    Fabry-Perot    Ionosonde

**Description of Observer Equipment:** One Infrared Fabry-Perot interferometer One two-channel

Photometer positioned at CTIO, Chile

**Special Equipment or setup:** I request use of two photometers, and two Fabry-Perots. I also request a mirror system for pointing above the infrared Fabry-Perot interferometer.

## **RFI Considerations**

### **Frequency Ranges Planned**

430 MHz

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