This proposal has not been submitted before.

Proposal Type: Regular
General Category: Terrestrial Aeronomy
Sub-Category: Spectroscopy
Sub-Category: Radar
Observation Category: Exosphere
Total Time Requested: 156 Hours
Minimum Useful Time: 4 consecutive nights each run, minimum.

Proposal Title: Hydrogen Transport in the Geocorona: Atomic H abundance and escape flux variations on secular, solar cycle, seasonal, and magnetic storm time scales.

ABSTRACT:
The variability of H and H+ abundances in the upper thermosphere, exosphere and topside ionosphere are studied to better understand magnetic storm response, seasonal variability, and secular variability that might reflect long term evolution of hydrogenous species abundance in the upper atmosphere. We evaluate these hypotheses: 1. A brightening of the Balmer-alpha emission following magnetic storm onset, observed in the past, is due to enhanced H abundance, and not to excitation by precipitation of energetic neutrals from the ring current. 2. The charge exchange induced escape flux of H in preferentially supplied at low and mid-latitudes when the O+/H+ topside transition height descends to low altitudes, near 500 km. 3. An apparent increase of the Balmer-alpha airglow brightness since 1983 is consistent with an increase in overall upper atmospheric hydrogenous composition due to increasing methane deposition at the earth surface, and by enhanced CO2 radiative cooling.

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>E-mail</th>
<th>Phone</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert B Kerr</td>
<td>Computational Physics Inc., (CPI)</td>
<td><a href="mailto:rkerr@cpi.com">rkerr@cpi.com</a></td>
<td>978-314-9760</td>
<td>no</td>
</tr>
</tbody>
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Remote Observing Request

- 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

**Special Equipment or setup:**  6563 FPI needed each run. 6300 FPI needed each run He FPI needed if new detector is in place, otherwise no need. 6563 (photometer needed each run) 8446 (photometer needed each run) all-sky imagers at AO needed each run all-sky imager Culebra, needed each run

**RFI Considerations**

**Frequency Ranges Planned**

430 MHz