Technical Page

Proposal Type: Regular
General Category: Terrestrial Aeronomy
Sub-Category: Radar
Observation Category: Middle-Lower Atmosphere
Total Time Requested: 168 Hours

Proposal Title: Mesopause studies using the Arecibo ISR and optical instruments

ABSTRACT:

We propose to use the Arecibo ISR, potassium lidar, Fabry-Perot photometer, and spectrometer to do a number of mesopause studies by utilizing the recently available lidar temperature profiles. The objectives of the proposed study include: 1) cross-calibrate the three type of instruments, which will likely result in better estimate of the ion-neutral collision frequency for the ISR and help to determine the emission altitudes of the airglow (O2, OH and O) layers, 2) study the composition of Es layers, 3) study the dependence of metallic/ionic chemistries on temperature, and 4) shed light on the low mesopause temperatures measured by the ISR and spectrometer. To accomplish these objectives, we request a total of 168 hours spread over one year’s time. This proposal should be scheduled in conjunction with the proposal by Friedman et al. (1999) if possible.

<table>
<thead>
<tr>
<th></th>
<th>Institution</th>
<th>E-mail</th>
<th>Phone</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qihou H Zhou</td>
<td>Arecibo Observatory</td>
<td><a href="mailto:zhou@naic.edu">zhou@naic.edu</a></td>
<td>878-2612</td>
<td>no</td>
</tr>
</tbody>
</table>

Instrument Setup

430 CH radar

Atmospheric Optical Instruments:
Tilt-Photometer Spectrophotometer Fabry-Perot Ionosonde Lidar

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

425-435

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