This proposal has not been submitted before.

**Proposal Type:** Regular
**General Category:** Terrestrial Aeronomy
**Sub-Category:** Radar
**Observation Category:**
**Total Time Requested:** 84 Hours
**Minimum Useful Time:**

**Proposal Title:** Common volume incoherent scatter radar and lidar observations of the mesopause region

**ABSTRACT:**

We propose to use the Arecibo incoherent scatter radar and the resonance lidars for common volume mesopause study. We request two periods of dedicated observations of 8 nights and 6 days. Additionally, we request to include the Coded-Long-Program in the World Day observations. Since ion-neutral coupling plays a significant role in mesospheric metal layers, the first objective of the proposal is to characterize relationships among atomic metals and electron concentration. The second objective is to compare chemistries of meteoric species in MLT through simultaneous temperature measurements and potentially Fe+. These efforts will aim to delineate the influence of chemistry and dynamics that shape the layers differently. The observation proposal is necessary to carry out the objectives in a NSF collaborative grant to Miami University and Arecibo Observatory. PI’s publications since 2009 using the Arecibo facilities are included as an appendix.

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>E-mail</th>
<th>Phone</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qihou Zhou</td>
<td>Miami University</td>
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<td>5135230743</td>
<td>no</td>
</tr>
</tbody>
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**Remote Observing Request**

- [ ] Observer will travel to AO
- [x] Remote Observing
- [ ] In Absentia (instructions to operator)

**Instrument Setup**

430 G

**Atmospheric Observation Instruments:**

Tilt-Photometer Spectrophotometer Fabry-Perot Ionosonde Lidar
Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

420 - 440