

## Technical Page

Proposal Type: Long-term  
 General Category: Terrestrial Aeronomy  
 Sub-Category: Radar  
 Observation Category: Ionosphere  
 Total Time Requested: 448 Hours  
 Minimum Useful Time: 5 hours

**Proposal Title:** Arecibo Experiments to Investigate Whistler Wave Interactions with Space Plasmas

*ABSTRACT:*

Based on preliminary results from our previous Arecibo experiments [Pradipta et al., GRL, 2007; Labno et al., JGR, 2007; Pradipta et al., Phys. Scr., 2008], we propose to conduct continuing experiments and numerical simulations to systematically investigate NAU-launched whistler wave interactions with ionospheric plasmas and radiation belts. Our recent theoretical analyses show that NAU-launched whistler waves can be backscattered to parametrically produce a daughter whistler wave and a forced ion acoustic mode, to trigger micropulsations [R. Pradipta, Ph.D. Thesis Prospectus, 2008]. This process may cause not only resonant interactions of energetic electrons with NAU whistler waves, but also pitch angle scattering of protons by NAU-triggered kinetic Alfvén waves in inner radiation belts at  $L = 1.35$ . It is expected that micropulsation-triggered electron and proton precipitation will yield a spatial distribution of plasma lines (PL) detected by the Arecibo radar.

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### Remote Observing Request

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

### Instrument Setup

430 G                      430 CH receiver    430 CH radar

### Atmospheric Observation Instruments:

Fabry-Perot    Ionosonde

**Description of Observer Equipment:** All Sky Imaging System, VLF receiving system.

**Special Equipment or setup:** None

**RFI Considerations**

**Frequency Ranges Planned**

None