

Technical Page

Proposal Type: Regular
 General Category: Terrestrial Aeronomy
 Sub-Category: Radar
 Observation Category: Ionosphere
 Total Time Requested: 14 Hours

Proposal Title: Incoherent Radar Observation of the Critical Ionization Velocity (CIV) Phenomenon using the ARGOS Satellite

ABSTRACT:

We propose to use the Arecibo incoherent scatter radar to observe the Critical Ionization Velocity (CIV) in gases released from the ARGOS satellite (800 km, near polar sun synchronous orbit). One of the experiments onboard ARGOS is the AFRL (AF Research Lab) CIV experiment, designed to release CO₂ or Xe at rates of 100 g/s for 6 to 10 sec. Arecibo may well be the only facility capable of observing CIV. We expect the Xe release to ignite CIV in the first 100-200 meters from the satellite with possible residual ionospheric effects extending for km downstream and along field lines. The observable effects will be elevated electron temperature ($\bar{0.5}$ eV), ion density increase ($\times 2$), and increased average ion mass (towards Xe,131). The satellite makes 2-3 overhead passes per week. The requested time covers 14 observation attempts.

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I NA want to do remote observing.

Instrument Setup

430 CH receiver 430 CH radar

Atmospheric Optical Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned