

## Technical Page

Proposal Type: Regular  
 General Category: Terrestrial Aeronomy  
 Sub-Category: Radar  
 Observation Category: Ionosphere  
 Total Time Requested: 96 Hours

**Proposal Title:** E region seasonal observations of Ion-Neutral Collision frequencies using plasma and ion line measurements

*ABSTRACT:*

It is proposed to measure the seasonal variation of the ion-neutral collision frequency in the E region using simultaneous ion and plasma line measurements. For this purpose, it is intended to use the Arecibo 430MHz line feed in a coded long-pulse (CLP) mode and receive the returned signal using the recently developed digital receivers to sample the ion and plasma line spectra simultaneously. With the ion and plasma line information derived from the observations, the number of estimated variables in the nominal least square fitting procedure is reduced. Consequently, better estimates are expected to be obtained from this fitting. The ion-neutral collision frequency is an important parameter from which conductivities and electric currents can be derived. At Arecibo, these measurements have been limited because of the low SNR (few electrons) at the E region and the fitting procedure that involves the electron density, electron and ion temperatures, and ion-neutral collision frequency to be fitted at the same time. It is expected that the additional information from plasma line allows better estimates of these ionospheric parameters.

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**Service Observing Request**

**Remote Observing Request**

- None
- All of the observing run.
- Part of the observing run.
- Queue Observing

- No
- Maybe
- Yes

**Instrument Setup**

430 CH radar

**Atmospheric Observation Instruments:**

**Special Equipment or setup:** none

**RFI Considerations**

**Frequency Ranges Planned**