

Technical Page

Proposal Type: Regular
 General Category: Terrestrial Aeronomy
 Sub-Category: Radar
 Observation Category: Ionosphere
 Total Time Requested: 60.00 Hours

Proposal Title: A new approach to the optimal extraction of ionospheric parameters from incoherent scatter radar measurements

ABSTRACT:

With the objective of improved accuracy in the estimation of the ionospheric parameters such as electron density, electron temperature, ion temperature and composition, we propose to conduct new F-region experiments in Arecibo, where amplitude or phase modulated pulses will be utilized as the transmitted pulses. Parameter extraction problem, then, will be addressed as a new inverse technique which involves the deconvolution of the ionospheric lag profiles prior to nonlinear least-squares fitting, which allows the range smearing to be completely removed (using regularization techniques). Several observations were made in 2004, where two heuristically selected amplitude modulated pulses were transmitted. Although the results were improved over those of a long pulse, the optimal pulse coding schemes remains open with potential for further improvements. This proposal requests the telescope time to run new F-region experiments, where optimally designed coded pulses are used in transmission. This project is part of a PhD thesis and involves Professors Farzad Kamalabadi and Erhan Kudeki of University of Illinois.

Name	Institution	E-mail	Phone	Student
Romina Nikoukar	University pf Illinois	nikoukar@uiuc.edu	(217) 377 9760	G

Service Observing Request

Remote Observing Request

- | | |
|---|--|
| <input checked="" type="checkbox"/> None
<input type="checkbox"/> All of the observing run.
<input type="checkbox"/> Part of the observing run.
<input type="checkbox"/> Queue Observing | <input checked="" type="checkbox"/> No
<input type="checkbox"/> Maybe
<input type="checkbox"/> Yes |
|---|--|

Instrument Setup

430 G 430 CH receiver 430 CH radar

Atmospheric Observation Instruments:

Ionosonde

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

429-431

This proposal requires Iridium RFI protection at 1612 MHz between 10pm and 6am EST.

This proposal requires coordination with Punta Salinas radar within the band 1222-1381 MHz..

This proposal requires coordination with GPS L3 at 1381 MHz.