2025 Workshop: New capabilities for studying equatorial aeronomy and space weather

Long title
New capabilities for studying equatorial aeronomy and space weather
Conveners
Danny Scipion
David Hysell
Marco Milla
Fabiano Rodrigues
dscipion@igp.gob.pe
Description

This workshop will highlight recent discoveries in equatorial aeronomy along with new developments in experimental, theoretical, and computational methods that make them possible. The focus will be on observations and research at the Jicamarca Radio Observatory. Results obtained from closely-related projects and instrumentation, including regional radio/radar networks, are also welcome. The session will combine a few review presentations with a number of science highlights.

Agenda

1. (20 min) Danny Scipion: "Jicamarca Radio Observatory: Updates"
2. (12 min) Marcos Inoñan: "J-ARGUS: An update on the efforts towards a tristatic radar capability"
3. (12 min) Carla Arce-Tord: "Developing a Calibration Pipeline: LWA Antenna Module Phase Calibration for J-ARGUS system"
4. (12 min) Cesar Valladares: "The LISN Network and Its Use to Understand and Forecast ESF Irregularities"
5. (12 min) Jorge (Koki) Chau: "SIMONe systems in Peru, their plan expansions and connections to low-latitude MLT dynamics
6. (12 min) Meers Oppenheim: "Questions about and new investigations of 150 km Echoes: Looking at these waves from multiple directions simultaneously"
7. (10 min) Alex Massoud: "Studies of post-midnight ESF over Jicamarca using two-dimensional radar observations"

8. (10 min)Aaron Kirchman: "Regional Simulations of Equatorial F-Region Interchange Instabilities Driven with Medium Power ISR"
9. (10 min) Isaac Wright: "Estimating low-latitude scintillation pattern orientations using a local array of sensors at Jicamarca"

Justification

Three recent developments prompt this workshop. One is a series of upgrades at Jicamarca that will fundamentally alter and expand its capabilities. Among these are new medium-power solid-state transmitters that will allow perpetual incoherent scatter measurements and fully- implemented automatic beam steering that will allow the fast reconfiguration of experiments. Also, the deployment of two LWA-type radio arrays in Peru will support and augment the capabilities of the Jicamarca radar while facilitating novel investigations bridging aeronomy and astronomy. Finally, the recently announced NASA sounding rocket campaign to take place in Peru in 2028 opens the possibility of additional synergistic projects and discoveries.
In this workshop, we will describe and discuss these new developments so that they can be fully exploited by the community.

Related to CEDAR Science Thrusts:
Encourage and undertake a systems perspective of geospace
Explore exchange processes at boundaries and transitions in geospace
Develop observational and instrumentation strategies for geospace system studies
Fuse the knowledge base across disciplines in the geosciences
Manage, mine, and manipulate geoscience/geospace data and models
Workshop format
Short Presentations
Keywords
equatorial aeronomy, remote sensing, radio science, space weather
View PDF