2017 Workshop: Low latitude CEDAR science

Long title
Data fusion for low-latitude CEDAR science
Conveners
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Description

The first part of this workshop will feature presentations and discussions on novel research efforts combining data from multiple sensors (including those at the Jicamarca Radio Observatory and those on ICON and COSMIC-2 satellites) for studies of low-latitude CEDAR science. In addition to data fusion efforts, this session will also stimulate discussions on model-data fusion activities. Furthermore, the session will discuss new approaches for data mining and new instruments at low latitudes. Finally, the session will provide a forum for a much needed discussion of the challenges associated with combining measurements from multiple, distinct sensors and potential steps to overcome these challenges.

The second part of this workshop will be dedicated to provide a venue for presentations on how rocket missions can address different outstanding science questions related to low-latitude CEDAR science. The workshop will also provide the first opportunity for a discussion of collaborative research efforts to address science questions that require multi-instrumented, collocated observations. Such an effort can be achieved during the low-latitude rocket campaign proposed for Peru.

Agenda

Monday 16:00 - 18:00

M. Milla: The Jicamarca Radio Observatory: Instrumentation, experiments, and database (pdf)

C. Valladares: Observations of bubble variability using the LISN network and SWARM/CNOFS satellites (pdf)

E. Pacheco: Satellite and ground-based instrumentation for TEC measurements at low latitudes (pdf)

V. Eccles: Assimilating low latitude magnetometer data for ionosphere electrodynamics

J. Morton: Common volume observations at Jicamarca using a multi-GNSS receiver and COSMIC radio occultation measurements to study ionospheric irregularities (pdf)

B. Harding: Multipoint Thermospheric Wind Observations: Networks of Fabry-Perot Interferometers and Plans for ICON (pdf)

L. Navarro: Effects of disturbance wind on equatorial regions recorded by the Fabry-Perot Interferometer network over Peru (pdf)

D. Hickey: Science enabled by all-sky imagers at low-latitudes (pdf)

Wednesday 10:00 - 12:00

Rob Pfaff: Towards a Peru sounding rocket campaign: Unprecedented, pre-eminent science at a unique observing site

David Hysell: Equatorial valley layers

Gerald Lehmacher: The MST-ISR-EEJ mode at Jicamarca Observatory and coupling in the equatorial ionosphere: Which complementary measurements are most needed?

Bruce Fritz: A simple, reliable detector for thermal ionospheric electrons

Jim Clemmons: Investigating the equatorial temperature and wind anomaly using a sounding rocket launched from Peru

[Cancelled] Paul Bernhardt: Charged Aerosol Release Experiment (CARE) III

Justification

The rapid increase in the number and types of instruments for CEDAR-science observations motivates an open discussion on how these multi-sensor measurements can be effectively combined so that “the total value of the unit is greater than the sum of its parts”. Therefore, we propose a workshop that will focus

on current studies and potential new approaches for future research on how to fuse data from multiple sensors to advance our understanding of underlying physical mechanisms; to improve the specification of state variables; and to identify/classify relevant events in low-latitude aeronomy. The workshop will also provide an opportunity for discussion of current model-data fusion efforts and ideas for future endeavors. Of particular importance to the proposed workshop is a rocket campaign being proposed for Peru.

The theme of the proposed workshop (data fusion for low latitude CEDAR science) addresses priorities described in the CEDAR Strategic Plan, NSF Geospace Science Plan, and Decadal Survey documents. It addresses, in particular, two of the six CEDAR strategic thrusts:

Scientific strategic thrust #4: Develop observational and instrumentation strategies for geospace system studies

Scientific strategic thrust #6: Manage, mine and manipulate geoscience data and models

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