2017 Workshop: Whole Atmosphere Variability

Long title
Whole Atmosphere Variability Revealed by Simulations and Observations
Conveners
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Description

Recent development of whole atmosphere models, state-of-the-art ground and satellite instruments, and long-term observational records is transforming our ability to characterize and understand the role of the lower atmosphere on driving ionosphere-thermosphere variability. This workshop is organized to promote the synergy of whole atmosphere modeling and observational efforts in order to 1) Validate these new atmosphere models through comprehensive comparative studies with observations, empirical models, and model-model comparisons. 2) Characterize ionosphere and thermosphere spatial- and temporal variability of different scales and processes linking them to solar and lower atmosphere forcing. 3) Explore upper atmosphere signatures of prominent lower atmosphere processes on various time scales (i.e. SSW, MJO, QBO, ENSO) and planetary waves and tides interactions.

Agenda

Erich Becker IAP/Germany Energy deposition of upward propagating waves

Quan Gan Clemson University Short-term variability in the ionosphere due to the nonlinear interaction between the 6-day wave and migrating tides

Valery Yudin NOAA/SWPC Whole atmosphere model predictions with specified meteorology of GEOS-5: Observed and Simulated Tidal Variability

Jian Du University of Louisville Long- and Short-term Tidal Variability and their Relative Contributions in the MLT region from eCMAM and SABER

Tzu-Wei Fang NOAA/SWPC Quantifying the Sources of Ionospheric Day-to-day Variability

Larisa Goncharenko MIT Sources of ionospheric variability - observational perspective

Chuck Bardeen ACOM/NCAR New Simulations of the 2003 Halloween Solar Storms Using WACCM-X

Loren C. Chang NCU On the Relationship between Sporadic-E and ENSO Observed by FORMOSAT-3/COSMIC

Justification

The variability of the space environment is important for modern technology and human activities, but is still poorly understood and quantified. No single set of observations adequately captures the neutral gas properties in mesosphere-lower thermosphere/thermosphere region. However, whole atmosphere models, data assimilation techniques and multi-platform observations (including upcoming ICON, GOLD, and COSMIC-2 satellites) can significantly improve our understanding of the whole atmosphere system. The workshop supports CEDAR Strategic Thrusts #1 and #2.

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