Physical Research Laboratory
Ahmedabad

Space & Atmospheric Sciences Division

Area Seminar

Title*:* **"QBO, ENSO and Solar Cycle Effects in Short-term Non-migrating Tidal Variability on Planetary Wave Timescales from SABER - An Information-Theoretic Approach"**

Speaker: **Ms. Komal Kumari,**
Department of Physics and Astronomy, Clemson University, Clemson, SC

Date: **13 January 2020**

Venue: **Ground Floor Lecture Hall**

Time: **16:00 Hrs**

Highlight of the talk:

Earth's atmosphere supports a variety of internal wave motion which are responsible for spatio-temporal changes in temperature, winds, density, and chemical constituents. One of the most striking dynamical features of the upper atmosphere (i.e. mesosphere and lower thermosphere [MLT], 50-120 km) are "Atmospheric Tides". In particular, the eastward-propagating non-migrating diurnal tide with zonal wave number 3 (DE3), originating from tropical deep convection, introduces a large longitudinal and local time variability in temperature, wind and density in the MLT region. The DE3 is thus a key to understanding how tropospheric weather influences space weather. However, DE3 short-term tidal variability is not well understood and part of the motivation for constellation missions. Single satellites such as TIMED nevertheless provide a pathway to identify multi-timescale tidal variability from days to years. We are utilizing 16 years of SABER (an instrument onboard TIMED satellite) DE3 tidal deconvolution diagnostics that provides a unique opportunity to investigate interannual changes in short-term tidal variability on various planetary wave time scales. The approach is based on information-theoretic techniques using Bayesian statistics, time dependent probability density functions and Kullback-Leibler divergence followed by multiple linear regression analysis. The statistically significant response to the inter-annual changes in short-term DE3 variability on planetary wave timescales with emphasis on 10-day wave associated with the quasi-biennial oscillation (QBO), El Niño-Southern Oscillation (ENSO) and solar cycle and their physical significance in relation to SABER 10-day wave diagnostics will be discussed in detail.

All interested are welcome.