# On the Study of Extra Long Period Oscillations (20-40 Day) Using Coordinated Measurements of MST Radar and Lidar

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Observations of tropical atmosphere show several important modes of low frequency oscillations. The low frequency variations of tropical atmospheric circulation exhibit three major components – interannual, annual and intraseasonal. Of these, the study on the Intraseasonal (10-100days) oscillations (ISO) has continued to be a topic of significant interest due to complexity and wide range of process with which interacts. Since their discovery by Madden and Julian (1971), there have been numerous observational, numerical and theoretical studies of tropical ISO. Recent attention is now growing in the connection of this lower troposphere ISO to the MLT (Mesosphere -Lower Thermosphere) region wind variability at intraseasonal scales. The preliminary study by the Eckermann and Vincent, 1994, provided some insights into origin of the MLTISO. They argued that the intraseasonally modulated gravity wave activity might propagate to into the mesosphere and dissipate; forcing similar ISO related periodicities in mesospheric winds. Subsequent study by the Eckermann et al, 1997 put forward several other possibilities for the observed MLTISO. Their observation leads to conclude that intraseasonal oscillations and diurnal variation in tropical tropospheric convection produce intraseasonal cycles in the intensity of gravity waves and non migrating diurnal tides entering the middle atmosphere thereby mapping them in MLT region. Another possible source of intraseasonal variability in the MLT region might be associated with the solar source through dynamical mechanisms which involves stratosphere, mesosphere and thermosphere coupling. Thus, MLT data alone are not sufficient to obtain a complete morphology and satisfying explanation of intraseasonal variability especially in the 20-40 day band which also involves a short term solar rotation period (quasi 27 day). By making use of coordinate measurements from Indian MST Radar and Rayleigh Lidar over Gadanki, a tropical station, we focused on the 20-40 day oscillation and studied their characteristics in the light of our current understanding.