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Seasonal Variation of Long-Period (6-8 hrs) Gravity Wave Activity as Observed from ISRO's MIDAS (2002-2007) Program

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Many Observational and theoretical studies show that gravity waves play an important role in the global atmospheric circulation, redistributing momentum in the atmosphere through their generation, propagation and breaking. Most of these studies have proved the role of gravity waves in the global circulation of high and mid-latitudes. In the tropical region, gravity waves associated with vigorous convection, can play important role in the generation of Quasi-Biennial Oscillation and Semi-Annual Oscillation. There are not much observational studies on this aspect of gravity waves from tropical region.

With an objective of studying the climatology of gravity waves in the equatorial region and to estimate the contribution of these gravity waves towards the generation of equatorial oscillations like QBO and SAO, a five year program has been started by Space Physics Laboratory, VSSC, ISRO and is known as ISRO's MIDDLE ATMOSPHERIC DYNAMICS Program (MIDAS 2002-2005). This program has got Theme based objectives also in addition to the above one. MIDAS program comprises of experimental observations from different locations over Indian sub-continent (involving multiinstitutions like SPL, TERLS; NMRF, Gadanki; EGRL, Tirunelveli and PRL, Ahmedabad) making use of ground based instruments like radars and lidars and in-situ measurements using Balloons and Rocket flights from TERLS.

Data and Results: Analysing the temperature data collected from Lidar at NMRF, during November 2002- December 2004, the seasonal variation in the propagation characteristics of long period (6-8 hr period) gravity waves, the energy and momentum flux carried by these waves etc. are estimated. It is found that the wave activity is in general stronger during winter season compared to summer season. The energy carried by these waves in the stratospheric-mesospheric region is correlated with the vertical wind in the lower region, which were derived from the MST radar wind data from Gadanki. The contribution of these waves towards the generation of equatorial oscillations like SAO is also estimated. Detailed results will be presented during the conference.