

## **Long-Term Variabilities of Low Latitude Mesospheric Tides: Role of Coupling from Below**

S. Gurubaran<sup>1</sup> and S. Sathishkumar<sup>1</sup>

<sup>1</sup>*Equatorial Geophysical Research Laboratory, Indian Institute of Geomagnetism, Tirunelveli, India*

Atmospheric tides are among the important physical phenomena which transfer energy and momentum between different regions of the atmosphere. They are generated in the lower and middle atmosphere due to absorption of solar radiation by atmospheric species, release of latent heat in deep convective clouds, etc. and when they propagate upward, they grow in amplitude and play a vital role in the heat and momentum budgets of the mesosphere and lower thermosphere (MLT) region. In the present work, we make use of long-term wind observations from the MF radar obtained from the low latitude Indian station, Tirunelveli (8.7°N, 77.8°E) for over seventeen years. The tidal variabilities in the interannual time scales at mesospheric heights are contributed primarily by: (i) the stratospheric QBO wind system and its variabilities, (ii) the El Nino Southern Oscillation (ENSO) and (iii) sudden stratospheric warming, though to varying extent. Several processes are involved that determine how each of these processes drive the long-term variabilities in tides at mesospheric heights. Results from this work are discussed in the context of the known processes that link the tidal wind generation, propagation of tides through various wind systems in the middle atmosphere and their interaction with planetary-scale waves participating in sudden stratospheric warmings and their variabilities as manifested in the mesospheric wind observations.