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Upper Mesosphere-Lower Thermosphere neutral wind observations using Meteor trails as tracers above a low Latitude station in India

Raman Selvamurugan (1) and Narayana Rao (2)

(1) Indian Institute of Geomagnetism, Plot #5, Sector –18, Kalamboli Highway, New Panvel, Navi Mumbai – 410 218, (2) National Atmospheric Research Laboratory, P B No.123, Tirupati, 517 502, India.

The MST radar in meteor mode has been operated over Gadanki (13.5º N, 79.2º E) in India with its narrow beam configuration while the transit of the intense Geminid meteor shower occurred during 13^{th} - 14^{th} December 2001. The observation was conducted with transmit and receive beam width of 3º in the observational plane (East-West) unlike the earlier attempts of configuring the MST radar antenna array in the wide beam mode in the orthogonal plane (North-South) and narrow beam in the East-West known as fan beam for meteor trail detection. The observation has provided the wind information with height resolution of 1.2 km and 16s time resolution at the peak occurrence height for the first time in the low latitude upper mesosphere lower thermosphere height (UMLT) region. The data collected from the meteor traces are in the range of 90-140 km over Gadanki with the Signal-to-Noise ratio normally found to be in the order of 30 dB and above. The Doppler shifts measured are obtained from the radar echoes and has been used to retrieve the winds. These winds in general are consistent and enable the estimation of gravity/tidal wave periods. This observation enunciates conducting regular observations on UMLT winds during meteor shower occurrences using Indian MST radar.