

Vertical and latitudinal wave forcing observed with network of Radars over Indian region

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Abstract

It is well known that gravity waves and tides play an important role in delineating the middle atmospheric structure and dynamics. Significant advancement has been in recent days in understanding the role of gravity waves and tides using different techniques in the lower, middle and upper atmosphere. However, only few results are available with simultaneous observations of all the three regions mentioned above. Further, no effort has been made so far in dealing with the latitudinal forcing of these waves and tides. With the establishment of advanced meteor radar at Sri Venkateswara University, Tirupati (13.63°N, 79.4°E) and up gradation of MF radar at Kolhapur (16.8°N, 74.2°E) together with existing MST radar at Gadanki (13.5°N, 79.2°E), Meteor radar at Thumba (8.5°N, 77°E) and MF radar located at Tirunalveli (8.7°N, 77.8°E) forms a unique network to address lower atmospheric forcing and its impact on middle and upper atmospheric structure and dynamics. All the above mentioned radars have been operated for few days simultaneously for investigating the short period gravity waves and tides (diurnal, semi-diurnal and ter-diurnal). Using simultaneous MST radar, Rayleigh lidar located at Gadanki and SVU meteor radar, lower atmospheric forcing and its impact of upper atmospheric is investigated. First results on short period gravity waves and tides are presented. Large day-to-day variability in gravity waves and tides is observed within a station and among the stations providing insight on vertical and lateral coupling. Thus, long-term measurements with all the above mentioned instruments is planned to address effectively the vertical and latitudinal wave forcing.