

## **Inertia-Gravity Waves at Upper Troposphere/ Lower Stratosphere Region: An Observational Study from 205 MHz Wind Profiler Radar.**

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A unique wind profiler operating at 205 MHz frequency has been set up at the Advanced Centre for Atmospheric Radar Research (10.04° N; 76.33°E), Cochin University of science and Technology, India. This stratosphere-troposphere radar has been providing accurate three dimensional wind profiles for an altitude range of 315 m to 20 km. The wind profiler constitutes 619, three element Yagi-Uda antennae with a power aperture product of  $1.6 \times 10^8 \text{ W m}^2$ . In this paper, we present the characteristics of inertia gravity waves (IGW) observed at upper troposphere/lower stratosphere from all round observations of wind profiles taken during November 22 to 27, 2016. The waves were observed between the altitudes of 14-20 km and the presence of IGW was detected in zonal, meridional and vertical wind profiles. Hodograph analysis performed on the horizontal wind for a monochromatic frequency shows a clock wise rotation of the ellipse, which indicates an upward propagation of energy from upper troposphere to lower stratosphere. Other wave characteristics like its intrinsic frequency wavelength, vertical wavelength, horizontal wavelength etc. were also derived from hodograph analysis. These waves were observed in conjunction with a persisting deep depression over the Bay of Bengal. The satellite data analysis further suggests the presence of over-shooting deep convective clouds over the Bay of Bengal during depression. It is hence possible that the IGW were triggered due to the perturbation of upper level wind by deep convection. This is the first time that IGW are being detected from 205 MHz wind profiler radar. These kinds of waves over tropical region will have profound influence on mass exchange from troposphere to stratosphere and thereby modulating the stratosphere dynamics.