# Observational and Modelling study of Inertia gravity Waves over tropical station Cochin

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Inertia-gravity waves (IGWs) are low-frequency gravity waves excited by restoring force of gravity and Coriolis force in response to a disturbance in atmosphere. Flow over topography, convection, and jet streams are the main source of gravity waves. IGWs effect the large scale circulation patterns and thermal structure of upper atmosphere by dissipation of their energy. QBO is modulated by convectively generated gravity wave over equatorial regions. Gravity wave signature can be obtained from vertical profiles of horizontal wind and temperature. Satellite, windprofiles and balloon has been extensively used in deriving vertical profile of atmosphere at high vertical resolutions. Cloud resolving limited area models at very high resolutions are also used to study dynamics and generative mechanism of gravity waves.

In this study we analyze gravity wave characteristics using horizontal wind components derived from a wind profiler over Cochin. Fast Fourier Transform (FFT) and hodograph analysis were used to compute propagation characteristics of wave. We also employ cloud resolving Weather Research and Forecasting (WRF) model to simulate gravity wave and understand its possible causes. Simulations were done for six continuous days from 26 October 2016 with different horizontal resolution. Model simulated wind shows good agreement with wind structure obtained from wind profiler. Impact of different cumulus and microphysics schemes are also studied.