Title: Atmospheric Gravity waves: an overview and case studies

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Abstract:

An important dynamical property of the atmosphere is to support wave motions. Atmospheric waves are excited when air at any level is disturbed from equilibrium. Gravity waves (GW) are one of them which owe their existence to stable density stratification of the atmosphere. They are ubiquitous, arise from a variety of source, and propagate vertically up with increasing amplitude carrying energy and momentum. They play an important role in middle atmospheric dynamics by transferring momentum and energy to distant regions where they can break and produce secondary disturbances and turbulence.

In the present talk some basics of GW will be discussed along with few case studies carried out using All-Sky Airglow Imager from Silchar, Panhala and Tirunelveli. It is also important to identify the possible source region for the observed the GW events to understand the dynamics behind the generation of GW. A Ray-tracing model enables us to trace the GW ray path in the atmosphere from point of observation to the possible source region. Some results obtained from ray-tracing will also be presented and discussed.

References:

[1] Fritts D.C. and Alexander M.J., *Gravity Wave Dynamics and Effects in the Middle Atmosphere*, Rev. Geophysics., 41(1), 1003, doi:10.1029/2001RG000106, 2003.

[2] Nappo C.J., *An Introduction to Atmospheric Gravity Wave*, 2nd edition, Academic press, 2013