

Study of atmospheric gravity waves of orographic origin by airglow imaging

*Masahiro Okuda¹, Hidehiko Suzuki¹

1.Meiji Univ.

Excitation and propagation processes of atmospheric gravity waves (AGWs) have been widely studied by both an observation and modeling schemes to understand energy and momentum balance in the middle atmosphere. Major sources of AGWs are known to be an interaction between winds and topography like mountains, inhomogeneous thermal absorption due to lands and sea distribution, active convections in troposphere, and wind shears etc. In particular, AGWs with orographic origin is thought as one of the important factors for a seasonal variation in mesospheric circulation, since the source is fixed to the ground. An airglow imaging system for OH7-3 band is newly developed and installed in Kawasaki, Japan (35.6°N, 139.5°E) in Nov 2015 to investigate propagation and excitation mechanisms of mountain waves over the Kanto plain. Since Kanto Plain is sandwiched by mountain rich area including Mt. Fuji and the Pacific Ocean, identification of AGWs from orographic origin is expected to be easy. For example, continuous easterly wind in a surface level would excite mountain waves with zero ground phase speed over the Kanto plain. In addition, a simple shape of cross section (i.e. Model-like shape) of the source (Mt. Fuji) would make comparison with modeling studies easy. In this talk, details of the airglow imaging system and prompt results from early observations are presented.

Keywords: Atmospheric gravity wave, Middle atmosphere, Mountain wave