

Statistical study of gravity waves observed by an all-sky airglow imager at Darwin, Australia

Shin Suzuki[1], Kazuo Shiokawa[2], Yuichi Otsuka[3], Tadahiko Ogawa[4]

[1] STELab, Nagoya Univ, [2] STE Lab., Nagoya Univ., [3] STEL, Nagoya Univ., [4] STE Lab., Nagoya Univ

An all-sky airglow imager has been placed at Darwin (12.4S, 131.0E), Australia, since October 2001, in order to obtain two-dimensional airglow images in the thermosphere and the mesopause region. The imager has five filters on a wheel, a fish-eye lens which has a field-of-view of 180 (deg.), and a cooled-CCD camera with 512 x 512 pixels. Using airglow images of the OI (557.7nm) and OH-band (720-910nm) emissions obtained for October 2001 - September 2002, we investigated wavelength, phase velocity and propagation direction of gravity waves. Most of the wavelengths we observed were less than 90 km (peak: 30-50 km), and phase velocities were less than 90 m/s (peak: 30-60 m/s). Most of the waves propagate in meridional direction, and the directionality depends highly on seasons. In winter waves propagate both poleward and equatorward, but in summer, almost all waves propagate poleward. We consider that this strong directionality is caused by location of the wave sources. That is, poleward waves seem to come from equatorial convection source through thermal duct structure. Sub-Antarctic storm system in winter accounts for the equatorward waves. In the presentation, we will also consider the effect of background wind field for the cause of the observed directionality.