

Statistical characteristics of polar cap mesospheric gravity waves observed by an all-sky airglow imager at Resolute Bay, Canada

Shin Suzuki[1]; Kazuo Shiokawa[2]; Keisuke Hosokawa[3]

[1] Univ. of Electro-Communications; [2] STELAB, Nagoya Univ.; [3] Univ. of Electro-Communications

Airglow imager at Resolute Bay, Canada (74.7 N, 265.1 E) has observed gravity waves in the polar cap mesosphere since January 2005. The observations have been made during the period without the sun and the moon in the sky. Sodium airglow (589.3 nm) images, which are obtained with an exposure of 30 s and a temporal resolution of 120 s, are used for the analysis, since the Sodium emission is the least susceptible to auroral contaminations. Base on long-term imaging observations on 137 nights during two winter seasons of 2005 and 2006, we investigated small-scale wave characteristics. The intrinsic parameters were also obtained by using meteor wind data observed at the same place. Observed waves typically had horizontal wavelength of 20-50 km, phase speed of 30-70 m/s, and intrinsic period of 5-15 min. Propagation directions were mostly westward (SW, W, and NW). These parameters seem to have no relation with magnetic activity represented as Kp index. On the other hand, low-pressure area in the troposphere laid to the east of Resolute Bay, which is the opposite direction of the wave propagation. These results suggest that sources of the observed small-scale waves over Resolute Bay are not auroral activities but tropospheric dynamics.

In the presentation, we will also report statistical results of larger-scale waves derived from keogram analysis on the same dataset.