

Comparative study on the mesospheric winds and temperature measured by Fabry-Perot interferometer and meteor radar at King Sejong Station, Antarctica

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Neutral winds and temperature in the mesosphere and lower thermosphere (MLT) have been simultaneously observed by Fabry-Perot interferometer (FPI) and meteor radar (MR) at King Sejong Station (KSS), Antarctica for a full year of 2017. The simultaneous optical and radar observations for the neutral atmosphere in the MLT region provide us with an excellent opportunity of comparing the measurements from the two observation techniques. Furthermore, since Antarctic peninsula has been well known for strong wave activities such as orographic gravity waves, the observations from these two instruments can be used to reveal the characteristics of neutral atmospheric responses to the waves in the MLT region. Using these observations, the neutral winds are compared at two airglow layers of 87 km and 97 km. We found the well-defined semidiurnal tidal structures such as downward phase progression and 90-degree phase difference between zonal and meridional winds. Neutral temperatures estimated from two instruments are also compared to investigate the geomagnetic effects on MLT temperature.