

MESOSPHERIC GRAVITY WAVE ACTIVITY AT MID AND HIGH LATITUDES AND THE DEPENDENCE ON THE SOLAR CYCLE

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The influence of solar activity on the dynamical and thermal state of the mesosphere is studied on the basis of long-term measurements of wind variances. The data base comprises time series of mesospheric winds at mid latitudes (Juliusruh, 54°N, 13°E), available since 1990, and at high latitudes (Andenes, 69°N, 16°E) since 1998. The seasonal variations and interannual variability of gravity wave activity are examined with regard to the filtering by background winds, tides, and planetary waves.

Particular attention is directed to the influence of solar activity on gravity waves during the summer months when the mesospheric winds show a strong correlation with the solar cycle. The observed mean gravity wave amplitudes in the mesosphere and lower thermosphere at mid and high latitudes are also compared to model estimations from the KMCM (Kühlungsborn Mechanistic Circulation Model) which resolves gravity waves in the extratropical mesosphere/lower thermosphere.

Gravity waves, winds, mesospheric dynamics

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