



Gravity wave activity and dissipation around tropospheric jet streams

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VHF radar measurements and meteorological balloon soundings were applied to study gravity waves and their dissipation in the troposphere and stratosphere around tropospheric jets crossing Andenes (69°N) in January 2005. The ALWIN MST radar is optimal for the investigation of waves and turbulence, it continuously provides winds, momentum fluxes and turbulence in the troposphere and lower stratosphere. Turbulent energy dissipation rates were obtained using both measurements of spectral width and of absolute calibrated echo power in combination with insitu measurements. The relation between observed dissipation rates and vertical flux of horizontal momentum is discussed. Enhanced turbulence (up to 30 mW/kg) was observed above a highly stable tropopause around 12 km during the passage of tropospheric jets with core wind speeds up to 110 m/s. An interpretation is proposed in which the gravity waves generated by the jets dissipate impinging on a region of strongly increased atmospheric stability at the tropopause following a theory by VanZandt and Fritts (1989).