Geophysical Research Abstracts
Vol. 14, EGU2012-7456, 2012
EGU General Assembly 2012

Global distribution of quasi two-day waves in the mesosphere and possible effects of gravity waves

M. Ern, P. Preusse, S. Kalisch, M. Kaufmann, and M. Riese

Institute of Energy and Climate Research - Stratosphere (IEK-7), Forschungszentrum Juelich, Juelich, Germany (m.ern@fz-juelich.de)

The quasi two-day wave is one of the most prominent wave modes observed in the mesosphere. It is likely generated in the mesosphere, and effects of the quasi two-day wave are found even at ionospheric heights.
A global climatology of quasi two-day waves is derived from temperature observations of the Sounding of the Atmosphere using Broadband Emission Radiometry (SABER) satellite instrument and compared with the global distribution of gravity waves also derived from SABER temperatures.
Seasonal, as well as interannual variations of wave activity are discussed.
Both quasi two-day waves and gravity waves display maxima of wave activity in the summer hemisphere around solstice, and it has been suggested that gravity waves might play an important role in the forcing of quasi two-day waves (e.g., Norton and Thuburn, 1996, or Limpasuvan and Wu, 2003). We find that gravity wave activity and zonal wind tendencies due to gravity waves, as well as zonal variations in both parameters, are always enhanced well before the quasi two-day wave is observed. These enhancements might trigger instabilities of the mesospheric summertime easterly zonal wind jet that can serve as potential sources of quasi two-day waves.