



## **The influence of gravity wave activity on the zonal mean wind under different climatological conditions**

K. Fröhlich and **Ch. Jacobi**

Institute for Meteorology, University of Leipzig, Germany (kfroehlich@uni-leipzig.de, +49-341-9732899)

In the mesosphere/lower thermosphere (MLT) region the mean wind fields change strongly with height. Because of gravity wave breaking and transience of tides and planetary waves this region exhibits a large variability in the meteorological fields. The interplay of upward energy and momentum propagation from lower layers by the waves and radiative differential heating determine the MLT circulation so that it is suited for detection of climatic trends and variability.

The COMMA-LIM, a simple general circulation model of the middle atmosphere, is used for numerical experiments that aim to estimate the different influences of radiation and gravity waves on the mesopause region. The model includes a sophisticated radiation routine allowing tides to be excited self-consistently and it uses an updated Lindzen-type gravity wave parameterization. The influence of breaking gravity waves of different intensity on the zonal mean flow and its vertical gradient is analysed under varying climatological (decreased carbon dioxide and increased ozone concentration) and solar conditions, and the degree of coupling between atmospheric layers through different processes is estimated.