Geophysical Research Abstracts, Vol. 8, 01810, 2006
SRef-ID: 1607-7962/gra/EGU06-A-01810

A global climatology of nonmigrating tides in MLT winds: Results from the TIMED Doppler Interferometer

J. Oberheide (1), Q. Wu (2), M.E. Hagan (2), T.L. Killeen (2), R.G. Roble (2)

(1) University of Wuppertal, Wuppertal, Germany (joberh@uni-wuppertal.de), (2) National Center for Atmospheric Research, Boulder, CO, USA

TIMED Doppler Interferometer (TIDI) measurements of zonal and meridional winds in the mesosphere/lower thermosphere provide a data set that is unprecedented in that it is amenable to global nonmigrating tidal analysis over a range of MLT altitudes. We overview climatologies of monthly mean amplitudes and phases for seven diurnal tidal components (i.e., westward propagating wavenumbers 2, 3, and 4; the standing diurnal tide; and eastward propagating wavenumbers 1, 2, and 3) at altitudes between 85 and 105 km and latitudes between 45°S and 45°N. Initial results for several semidiurnal tidal components are also presented.

A comparative analysis with the tidal predictions from two models, the global scale wave model (GSWM) and the thermosphere-ionosphere-mesosphere-electrodynamics general circulation model (TIME-GCM), provides insight into some of the tidal forcing mechanisms, i.e. latent heat release in the tropical troposphere and non-linear wave-wave interaction. It such directly addresses elements of CAWSES that pertain to the elucidation of dynamical coupling processes in the atmosphere. Although the model descriptions are quite satisfactory during equinox, the comparisons nevertheless indicate numerous shortcomings in our current understanding of the nonmigrating tides. The TIDI data can thus provide the necessary guidance for further improvements of tidal forcing and dissipation schemes in atmospheric models.