0.1 The Numerical Simulation of Gravity Waves Propagating Upward Through the Middle Atmosphere Forced by Latent and Convective Heating

Y. Yu (1,2) and M. Hickey (1)

1. Department of Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, Florida, USA (yonghui.yu@erau.edu, michael.hickey@erau.edu / Fax: 386-2266621 / Phone: 386-2266647)
2. Department of Physics, University of Central Florida, Orlando, Florida, USA

Latent and convective heating due to the release and absorption of energy by evaporation and condensation is a tropospheric forcing mechanism for internal gravity waves. This mechanism is periodic with a localized energy source term that forces gravity waves that propagate upward with a primary frequency comparable to the forcing frequency. A time-dependent and fully nonlinear numerical model is described that solves the Navier-Stokes equations in two spatial dimensions to evaluate the characteristics of gravity waves generated by this mechanism in the lower atmosphere. A brief analysis of the fluctuations in the atmospheric density, pressure and velocity is presented, followed by the forcing effects of the waves on the mean flow. In addition an assessment of the momentum and thermal budgets in the mesopause region due to the dissipating gravity waves is made.