

Superposition effects between tidal components and implications

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A broad spectrum of tidal components is excited in the extended Canadian Middle Atmosphere Model (CMAM). These dominate the dynamics of the mesosphere and lower thermosphere. Their superposition results in periodic wind, temperature and vertical displacement variations whose amplitudes vary geographically and evolve with time. The superposition fields also result in regions and local times where conditions for convective and dynamical instability are met. These fields modulate the conditions for gravity wave breaking and result in periodic variations in the gravity wave forcing in the mesosphere and lower thermosphere (MLT). In this paper, the form of the tidal spectrum in the model results will be summarized and effects associated with their superposition described. It is clear we are now at the stage of starting to explore the details of the mechanisms lying behind the accepted zonal and time mean picture of forcing in the MLT region.