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Mesosphere Dynamics with Gravity Wave Forcing, 1: Diurnal and Semi-Diurnal Tides (Paperback)

By -

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.We present results from a nonlinear, 3D, time dependent numerical spectral model (NSM), which extends from the ground up into the thermosphere and incorporates Hines Doppler Spread Parameterization for small-scale gravity waves (GW). Our focal point is the mesosphere that is dominated by wave interactions. We discuss diurnal and semi-diurnal tides in the present paper (Part 1) and planetary waves in the companion paper (Part 2). To provide an understanding of the seasonal variations of tides, in particular with regard to gravity wave processes, numerical experiments are performed that lead to the following conclusions: 1. The large semiannual variations in the diurnal tide (DT), with peak amplitudes observed around equinox, are produced primarily by GW interactions that involve, in part, planetary waves. 2. The DT, like planetary waves, tends to be amplified by GW momentum deposition, which reduces also the vertical wavelength. 3. Variations in eddy viscosity associated with GW interactions tend to peak in late spring and early fall and can also influence the DT. 4. The semidiurnal tide (SDT), and its phase in particular, is strongly...



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