

GRAVITY WAVE COUPLING FROM LOWER ALTITUDES INTO THE THERMOSPHERE AND IONOSPHERE: ANTICIPATED NEUTRAL AND PLASMA RESPONSES

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Recent studies have demonstrated the potential for gravity waves (GWs) arising from deep convection and having large spatial scales to achieve large amplitudes in the thermosphere and ionosphere (TI). Only large-scale and relatively high-frequency GWs can penetrate to high altitudes, and the range of scales and frequencies for GWs excited in the lower atmosphere becomes increasingly confined with increasing altitude. Neutral responses are expected to include 1) strong refraction in tidal winds, 2) large momentum transport and neutral body forces, and 3) potential neutral instabilities exciting additional neutral motions. Plasma responses are expected to include 1) large plasma density perturbations extending to the bottomside F layer, 2) contributions to plasma instability seeding, 3) plasma bubbles extending to higher altitudes, and 4) influences on plasma bubble statistics and their variations with longitude and solar forcing. Observational evidence for some of these responses will be discussed; other anticipated responses remain to be tested by future observations.

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