Impact of Tsunami-Generated Gravity Waves on the Ionosphere

Huba, Joseph (1), huba@nrl.navy.mil; and Douglas Drob (1).
(1) Naval Research Laboratory, Washington, DC, USA

The NRL first-principles ionosphere model SAMI3 is used to study the ionospheric effects associated with tsunami-driven gravity waves. It is shown that gravity-wave induced variations in the neutral wind lead to plasma velocity variations both perpendicular and parallel to the geomagnetic field. Moreover, the electric field induced by the neutral wind perturbations can map to the conjugate hemisphere. Thus, electron density variations can be generated in both hemispheres which impact the total electron content (TEC) and 6300A airglow emission. It is found that the TEC exhibits variations +/- 0.15 TECU and the 6300A airglow emission variation is up to +/- 2.5% relative to the unperturbed background airglow. These results are consistent with observational data.

Research supported by NRL Base Funds, NASA LWS program, and ONR BRC program.