

Gravity waves and infrasound in the polar mesosphere and lower thermosphere

V.D. Tereshchenko, O.F. Ogloblina, V.A. Tereshchenko, T.V. Kovalevich (*Polar Geophysical Institute, Murmansk, 183010, Russia; E-mail:vladter@pgi.ru*)

Interaction of the gravity and infrasound waves with the lower polar ionosphere observed by vertical MF radar sounding on a fixed frequency is described in terms of characteristic changes in the echo group part, and amplitudes of waves with the ordinary and extraordinary polarizations, partially reflected from D-region irregularities. Observations of this interaction are presented for atmospheric waves, generated during underwater explosion of 12.08.2000, magnetic storm of 30-31.03.2001, and Siberian meteorite explosion (near Bodaibo, Irkutsk region) of 24.09.2002. An analysis of all sounding parameters has been performed to determine the electron density data, and the power spectra of amplitude signal fluctuations at different heights for altitude range of 70-100 km. Furthermore the local frequencies of the atmosphere eigentones are determined.

It was established that during the discussing events the changes in the spectrum forms occur. The important features of such changes are the significant amplification of the high-frequency amplitude fluctuations, in the frequency band higher Väisälä-Brunt frequency, and an increase in the slope of the low-frequency part of the spectrum. The changes in the spectrum form can be explained by influence on mesosphere of the infrasound and gravity waves.