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Sixteen-day atmospheric planetary wave in temporal variations of the earth's magnetic field according to European stations

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Typical periods for planetary waves (close to periods of 2, 5, 10 and 16 days) were first detected in variations in ionospheric absorption of radio waves (D-region), which were associated with simultaneous 5-day waves in the stratosphere. The results of the studies generally confirm the similarity of the spectra of disturbances (in the range of periods of planetary waves) in the atmosphere and various ionospheric layers. At the same time, attention was drawn to the possibility of penetration of these disturbances to a height of more than 100 km.

In work, using the results of geomagnetic monitoring at European stations, as well as spectral analysis methods, spectral harmonics in the range of periods from 12.5 to 17 days are studied.

The results of the studies conducted in this paper show that the spectra of temporal variations of the geomagnetic field (observed on the earth's surface and caused by variations in ionospheric currents) contain both harmonics associated with solar activity and harmonics corresponding to quasi-16-day planetary waves. In addition, in the spectrum of variations in the horizontal component of the geomagnetic field induction in the range of periods from 12.5 to 17 days, harmonics associated with the modulation effect of longer-period variations and tidal action are identified. This indicates the importance of energy transfer by atmospheric waves to ionospheric heights and their influence on dynamic and electrodynamic processes in the ionosphere.

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