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The spatial-temporal characteristics of the periodic variations of the total ozone content

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An analysis of periodical processes of total ozone content (TOC) during 21 and 22 solar cycles and their comparison to Solar activity (radio emission on 10.7 cm) is presented. The analysis was done using total ozone observations from the Total Ozone Mapping Spectrometer (TOMS) on board Nimbus-7 and observatory Dominion Astrophysical Observatory (Canada) data for the 1979-1992 period. To depict the hidden periodicity of a signal we used the mathematical apparatus of Wavelet-transformation. The following components were studied: dynamic spectra, power spectra, and also the correlation processing of the significant harmonics. The obtained harmonics are observed both in relation to the total ozone as well as radio to the emission data. They can be divided into four groups: global harmonics due to solar cycle (5, 7, 11 and 22 years); quasi biennial oscillation (about 2.5 years); modulation caused by change of a mutual arrangement the Sun-Ears (30, 60, 180 and 365 days) high-frequency components (6 days climatic component for ozone and 27 days for a radio emission). It is shown that the quasi-biennial harmonic represents a superposition nearest harmonics - 1.8 and 2.7 years, and the maximum of power have place at a minimum of solar activity. For the 6 day time climatic components the shown response is related to natural events, having both global (impact of volcano Pinatubo), and local character (solar burst with high energetic protons. It is also shown that there is a 180-day time modulation of a climatic harmonic. By consideration of dependence of power of integrated spectra for ozone at various latitudes, the latitude of 100S was selected, where there is a minimal power of all harmonics spectrum. Also, it was observed a latitudinal asymmetry of power spectral components around the equator in both hemispheres.

Keywords: **radio emission of the Sun**, **instrinic harmonics** , **total ozone content (TOC)** , **wavelet analysis**

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