STUDY OF SPATIAL DISTRIBUTION OF EARTH GRAVITATIONAL FIELD BY SPECTRAL WINDOW LIMITING METHOD

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The article shows how windows are formed by successively combining harmonics $C_{nm}P_{nm}(\sin\varphi)\cos m\lambda$ и $S_{nm}P_{nm}(\sin\varphi)\sin m\lambda$ into a separate group, which act as a lowpass or high harmonic bandpass filter. Manipulation of spectral window width allows to get information about the nature of gravity field spatial distribution in certain frequency ranges. The degree range of the harmonic window was selected so that the result was oriented towards the actual source of the gravity disturbance. Calculations of spectrozonal models of quasi-geoid field height of Western Siberia, Fennoscandia, and Central Russia territories with degree series limiting by values $N_{1\text{-}2}$ from $N_1 = 2$ to $N_2 = 200$, from $N_1 = 9$ to $N_2 = 22$ and $N_1 = 30$ to $N_2 = 200$, were carried out in GeoUnd 1.0 software. This software is used to calculate quasi-geoid height by expansion of gravity field coefficients in spherical functions row. These spectrozonal models are presented in graphical version for illustration and analysis. Results show that using of global quasi-geoid spectrozonal models obtained from Earth's gravity potential combined models is a modern and productive method for detecting current and future vertical Earth crust movements in local and regional areas.

Keywords: monitoring, Earth gravitational field, harmonic analysis, frequency band window, structure of the earth's crust, geoid

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