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Analysis of the geodynamic activity near large reservoirs

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Abstract

© SGEM2019. All Rights Reserved. Currently, there are a number of works focusing on the study of the geodynamic situation near the large reservoirs. These studies cover many areas of research from geodynamic models of the Earth's crust and geodynamic activity of water reservoirs (e.g. lakes) to dynamics of the Earth's rotation and oil deposits. This paper presents a new method of analyzing the geodynamic situation near the large reservoirs. As an example, the geophysical conditions near Kuybyshev are determined using the method and data on latitude observations produced at the Engelhardt astronomical observatory (EAO). It is concluded that the geodynamic activity appears to be rather considerable near the large reservoirs. It is also revealed that the Earth’s crust and subcrust substance are constantly moving. The long-period variations of non-polar changes of an average latitude on EAO’s latitude for the period from 1950 to 1996 were obtained by excluding polar and non-polar harmonics, which is a common procedure in astronomy. This was carried out by using a method of linear transformation in order to produce a smooth line. The average rate of the surface inclination change was found to be 11.25" per year. Based on this value, it is confirmed that a large reservoir, such as Kuybyshev, causes the geodynamic activity and eventually leads to subsidence of the surrounding area in the center of the reservoir itself. As can be seen, the change of the surface inclination caused by the influence of man-made structures, such as Kuybyshev reservoir, is significant and should be carefully monitored using all the available methods of observation.

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Keywords

Geodetic measurements, Geodynamic situation near the large reservoirs, Method of the latitude observations

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