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Global component of lithospheric deformations caused by variation of the Earth rotation rate.

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The question of the global mechanism influencing state of the Lithosphere and probably being trigger for the strongest earthquakes is discussed. As one of possible mechanisms, we had been considered geodynamic rotational model in which processes of redistribution of the stress-strain state of earth crust are classified as reaction of the angular momentum of lithospheric blocks on change of the speed of rotation of the Earth. In development of this idea the relation of the local deformation fields, which are displays of deformation processes of global character, with variations of the Earth rotation rate has been studied.

The correlation analysis was based on the original strain data from two space separated (2000 km) observation stations, equipped by geophysical laser interferometer-strainmeter (the Northern Caucasus) and quartz strainmeter (Moscow region) and time series of the variations of the Earth rotation rate (the Length Of the Days, LOD) from the IERS catalogue. As a whole, significant correlation relations between strain data and variations of the Earth rotation (LOD) are observed. Increasing above a significance value (Confidence level is defined as 0.95) and reaching the maximum values of 0.8-0.9, the correlation keeps such values during a time of 1-5 weeks and then falls down.

In the frame work of the considered model the estimation of the deformations of the Earth surface due to the variation of the Earth rotation has been done. The modeling values agree very well with observed data that confirms a hypothesis about relation between a global component of strain field and global geodynamics of the Earth.

The existence of the lithospheric deformations having a global character on short time scale (order of month) is proved at a statistically significant level. The links between a global component of strain field and global geodynamics of the Earth (variations of the rotation rate) are shown. Global components of lithospheric deformations are caused by powerful long periodical tidal harmonics (mainly, the group of tidal waves Mf) , which are govern the variation of LOD. These processes most likely, modulate periodic sign-variable behaviour of values of mutual strain correlation function in time.

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