

Modern geodynamic systems of the Urals in relation to seismicity

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Abstract Modern geodynamic systems of the Urals are studied in connection with the uneven distribution of seismic activity. The neotectonic zoning and geodynamic conditions of its formation in the Southern and Middle Urals and adjacent platform territories were studied in connection with the Katav-Ivanovo medium-magnitude earthquake occurred in 2018. The epicenter was located outside the known zones of possible seismic sources, which required additional research to determine the causes of the earthquake. As a result of near-surface and deep research the Uraltau-Magnitogorsk and Osinsko-Bolsheusinskaya geodynamic systems have been established, which are the cause of the transverse segmentation of the Urals and, possibly, one of the factors of seismic activity. The geodynamic systems are inconsistently articulated with each other with the development of the Birsko-Karatau geodynamically active zone and the Katav-Satka interference zone. The earthquake is associated with the Katav-Satka interference zone. The interference zone has been investigated with respect to fracturing and slickenlines. Orientations of modern stresses induced from the active regions are estimated. Modern stresses are the reason for the activation of the Zilmerdak from the beginning of the Late Paleozoic overstep and, as a consequence, the Katav-Ivanov earthquake. Earthquakes caused the development of secondary dangerous seismogenic phenomena and deformation of buildings.

Keywords Neotectonic zoning, deep geodynamics, interference zone, geodynamically active zones, seismicity, mud slides.

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