

Modeling of the stress-strain condition of the Earth's crust of Sakhalin Island: impact of hydroisostasy

Rustam F. Bulgakov, <https://orcid.org/0000-0001-9095-3785>, r.bulgakov@imgg.ru

Institute of Marine Geology and Geophysics, FEB RAS, Yuzhno-Sakhalinsk, Russia

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Abstract. The paper attempts to answer the question about the role of contribution of the hydroisostasy to the stress-strain state of the Earth's crust on the Island of Sakhalin. The hydroisostasy contribution was estimated by simulation by means of finite element method. The mesh grid for the calculation was constructed using the real values of the depth of the Moho discontinuity surface and the topography of Sakhalin Island with adjacent shelf areas. The calculation took into account the Central Sakhalin fault zone. Lateral displacements as a result of strain and lateral displacements combined with vertical ones were simulated separately. Comparison of the results of the stress-strain state simulation, taking lateral displacements and their combination with vertical ones into account, clearly demonstrates the significance of the hydroisostasy contribution to the stress-strain state of the Earth's crust in the Sakhalin region.

Keywords:

hydroisostasy, stress, strains, vertical movements, fault, Elmer, finite element method

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