

Density and rheological inhomogeneities in the mantle of the active oceanic margins of western part of Pacific Ocean and the Kuril deep-sea trench area

*Rustam F. Bulgakov**

Vladimir N. Senachin

Maksim V. Senachin

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

**E-mail: r.bulgakov@imgg.ru*

Abstract Резюме [Rus PDF](#)

Recent knowledge of active oceanic margins with using of geodynamic simulations under constraints of gravity anomalies is analysed in this work. The aim of the analytical review is estimation of density and viscosity distribution in the subduction zones of the well investigated deep trenches of Pacific Ocean. The comparative analysis allows to apply these parameters estimations to the Kuril subduction zone. For the deep structure of the Kuril trench subduction zone the average excess of descending slab density versus the mantle layers at the same depths in the range for 0.02–0.05 g/cm³ can be expected. The mantle viscosity varies in the range from maximum 1023 Pa s within the lower layers to 1019 Pa s inside the low viscosity wedge. The viscosity of the descending slab decreases with the depth. The asthenosphere viscosity is probably by 10 factor higher than low viscosity wedge. Low viscosity wedge of the Kuril transition zone should be big enough to be the cause of back-arc spreading and the Kuril deep-sea basin forming. The geoid anomalies are the significant additional informative source for investigation of the deep structure of the transition zones.

Keywords

low viscosity wedge, geoid, subduction, Kuril zone

For citation: Bulgakov R.F., Senachin V.N., Senachin M.V. Density and rheological inhomogeneities in the mantle of the active oceanic margins of western part of Pacific Ocean and the Kuril deep-sea trench area.

Geosystems of Transition Zones, 2020, vol. 4, no. 1, p. 116–130. (In Russian).

<https://doi.org/10.30730/2541-8912.2020.4.1.116-130>

Для цитирования: Булгаков Р.Ф., Сеначин В.Н., Сеначин М.В. Плотностные и реологические неоднородности мантии активных океанических окраин западного сектора Тихого океана и зоны Курильского глубоководного желоба. *Геосистемы переходных зон*. 2020. Т. 4, № 1. С. 116–130.

<https://doi.org/10.30730/2541-8912.2020.4.1.116-130>

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