

3-D model of the deep structure of the Yenisei-Khatanga regional trough

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SUMMARY

This work is devoted to the study of the deep structure of the Yenisei-Khatanga regional trough (YKRT) in Northern Russia, where more than 25,000 MT soundings have been performed over the past 20 years over an area of 1200x400 km along a network of profiles. At present, two theories of the deep structure of this region and the origin of the trough are most popular: the “over-rift” and “eclogitic” hypotheses.

3-D inversion of MT data was performed using the ModEM code. From the entire data array, about 800 MT sites were selected over a 20x20 km network. Based on the results of 3-D inversion, a three-dimensional resistivity model of the deep structure of the Yenisei-Khatanga regional trough was obtained. Within the western half of the YKRT, there are no high-resistivity basement rocks; a sublatitudinal conductive zone is observed, which in general can indicate rifting processes. This testifies in favor of the “over-rift” theory of the origin of the western part of the YKRT. The eastern half of the YKRT at depths of more than 10 km has a geoelectric structure similar to the Siberian platform and similar structures in the northwestern and sublatitudinal directions. This suggests that rift processes did not occur here. The origin of the eastern part of the trough is rather explained by the “eclogitization” of the lower crust.

Keywords: 3-D inversion, deep structure, Yenisei-Khatanga regional trough
