Chapter 26
On 2D Inversion of MTS Data in Tobol-Ishim Interfluve of Western Siberia

N. V. Baglaenko, V. P. Borisova, Iv. M. Varentsov, T. A. Vasilieva and E. B. Fainberg

Abstract The results of 2D inversion of amplitude and phase effective curves from magnetotelluric soundings in the Tobol-Ishim interfluve of Western Siberia are presented. These results confirm the existence of conductive regional faults of submeridional strike and a conductive asthenospheric layer at depths of 70–80 km. The revealed deep conductive anomalies may indicate peculiarities of the oil and gas generation regimes.

Keywords Magnetotellurics • Tobol-Ishim interfluve • Conductive layer

In the article (Borisova et al. 2013) the analysis and 1D inversion of the amplitude and phase curves of magnetotelluric (MT) soundings made by the Tyumen Geological department in 1980–1981 was carried out, followed by the construction of a two-dimensional geoelectric model by the “stitching” of 1D sections obtained. A series of regional faults of submeridional strike have been identified in the geoelectric section of the Tobol-Ishim interfluve. In addition, at depths of 55–70 km, the roof of a conducting horizon is traced, whose resistivity is tens of Ωm, and two extents of an abnormal rise of the roof of the conductive horizon are identified (Fig. 26.1), one of which corresponds to the Kiselevsky fault (at depth of 60–65 km), another—the onboard zone of the Ishim branch of the Triassic rift system of the West Siberian Plate (at depth of 55–60 km). It has been supposed that the Ishim geoelectric anomaly corresponding to the geothermal anomaly and the features of the related deep geological structure is due to the element of the mantle-crustal fluid paleosystem. It is critically important to verify these results within the class of a two-dimensional (2D) inversion.

For the construction of a 2D model of the studied area, the profiles 16 and 20 of 108 and 57 km lengths were chosen. The MTS data measured along these profiles,

N. V. Baglaenko • V. P. Borisova • Iv. M. Varentsov
T. A. Vasilieva • E. B. Fainberg (✉)
GeoElectroMagnetic Research Centre, Schmidt Institute of Physics of the Earth Russian Academy of Sciences, Moscow, Russia
E-mail: edfain@yandex.ru

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