

GEOELECTRIC PARAMETERS OF THE EARTH CRUST AT THE SOUTH-WEST MARGIN OF THE EAST-EUROPEAN PLATFORM IN UKRAINE.

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Geoelectric parameters of the Earth crust at the western slope of the Ukrainian Shield (USh) and the Volyno-Podolian Plate (VPP), representing south-west margin of the East-European Platform, are studied in this work. Parameters were estimated by using 1D inversion of the MTS curves within the range of 0.1 - 1000 s, 2D modeling of geomagnetic induction arrows and MT soundings within the range of periods 40-10800s and a quasi-3D inversion of the geomagnetic induction arrows at the periods of 100 – 6400 s. 1D inversion was carried out using Parker (D+) and OCCAM techniques. For elimination of the galvanic effect all MTS curves were shifted vertically to the base curve which was obtained from the results of the magnetovariational sounding at the Kiev observatory. The results of the 1D inversion reveal low resistivities between 0-4 km for the major part of the VPP. Conductances within the surface layer reach 100 S in the south and 500 S in the north. In the southern part of the region three conductors are indicated at the depths of 8-10 km, 18-20 km and 35-38 km. Conductance within these conductive layers varies between 100–240 S (reaching 300 S at the depths larger than 20 km), while resistivities at the depths shallower than 30 km are 100-180 Ohmm. The conductors in the granite and intermediate layers are spread in quasimeridional direction along the transition zone between the USh and the VPP. Conductors within the intermediate layer are located parallel to the boundary of the VPP and the Pre-Carpathian Depression. 2D modeling using REBOCC technique, carried out on the profile crossing the Carpathians and reaching the central part of the VPP, revealed crustal conductors within the VPP and a lower crust-upper mantle conductor. The previous studies also suggested the conductor at the boundary of the crust and upper mantle in the south-west boundary of the VPP and the Pre-Carpathian Depression. The results of the quasi-3D (thin-sheet) inversion for a conductive layer at the depth of 8 km seem to confirm the conclusions of the 1D and 2D inversions. There is a higher conductance zone along the transition between the USh and the VPP and another conductive zone along the boundary of the VPP (corresponding to the boundary of the East-European Platform here) and the Pre-Carpathian Depression. The prominent conductive zone (Carpathian Conductivity Anomaly) is clearly seen at the depth of 8 km.

Ukrainian Shield, the 1D, 2D and a quasi-3D inversion

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