

## **UPPER MANTLE STRUCTURES BENEATH CENTRAL EUROPE: FROM FIRST ANTAL ADAM'S RESULTS TO RECENT ONES**

Vladimir Semenov, Waldemar Jozwiak

Institute of Geophysics, Polish Academy of Sciences, Warsaw, Poland, email: [sem@igf.edu.pl](mailto:sem@igf.edu.pl)

The first detection of the mantle conductive asthenosphere in the Europe was made by professor Antal Adam as early as 1966 by the magnetotelluric sounding method. The result awakened interest in investigations of the geoelectrical properties of the upper mantle. The local results obtained later by the induction soundings of the mantle in Europe had high scatter of inversion results. This brings up the question: is asthenosphere a regional or global phenomenon? Perhaps the exact answer cannot be obtained in the frame of the ground induction soundings only. However, recent regional studies including the northern (BEAR) and central (CEMES) Europe projects have established that the lithosphere is more resistive beneath the East European Plate than beneath the western Paleozoic one and has essentially different thickness. So, if we are using term of asthenosphere, its depth is changing from less than 100 km beneath the Pannonian Basin up to  $\approx 300$  km beneath East European craton.

The boundary between those plates coincides with the Trans European Suture Zone (TESZ), which is crossed now by many profiles with electromagnetic field observations. These profiles are situated from the Sweden – Germany profile in the north-west TESZ to the Ukraine – Hungary one in the south-east TESZ. The majority of the profiles were concentrated and carried out in Poland. Comparison of the geoelectrical structures between these profiles is presented in this work, as well as the regional distribution of the upper mantle conductance according the induction soundings made in the frame of the CEMES project. Besides, the estimation of the mid-mantle conductance (700-900 km) using the response functions obtained independently by J. Roberts, A. Schultz, V. Semenov and N. Olsen based on the geomagnetic observatory data from the European region has pointed out that the structure cannot be considered as homogeneous.

The obtained regional results of the mantle conductance distributions are qualitatively compared with the surface of the geoid and regional seismic data at the same depths. Their correlations are close but seismic velocities have reverse correlation with conductance in the mid and upper mantle.

mantle structure

Waldemar Jozwiak, Institute of Geophysics, Polish Academy of Sciences, Ksiecia Janusza 64, 02-953 Warsaw, Poland, email: [jozwiak@igf.edu.pl](mailto:jozwiak@igf.edu.pl)