

Electromagnetic investigations of lithosphere–asthenosphere boundary in Central Europe

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During the years 2002-2006, the long-period magnetotelluric and magnetovariational data were collected and interpreted in order to accomplish the national MT CELEBRATION project and the international CEMES project in Central Europe.

Ten deep 1D electromagnetic soundings composed from MT and magnetovariational data were performed and 3D image is presented as the result for Slovak region. The inversion results give the estimation of the lithosphere thickness from 100km to 160km for the investigated region of western Slovakia.

In the frame of the CEMES project, five international teams were engaged in collecting the long-period magnetotelluric data at positions of eleven permanent geomagnetic observatories situated within the region of the longitude of a few hundreds kilometres along the south-west margin of the East European Craton. They estimated the magnetotelluric responses independently by using different data processing procedures. The conductance distributions at the depths of the upper mantle have been derived individually beneath each observatory. By averaging the individual cross-sections, we have designed the final model of the geoelectrical structure of the upper mantle beneath the CEMES region. The results indicate systematic trends in the deep electrical structure of the two European tectonic plates and give the evidence that the electrical structure of the upper mantle varies between the East European Craton and the Phanerozoic plate of west Europe. There is a separating transition zone that coincides with the Trans-European Suture Zone.