in the West Pacific and South-East Asia, depressions close to the mid-ocean ridges and a weak elevation in the East Pacific.

Our model confirms the large-scale pattern of the dynamic surface topography proposed on the basis of bathymetric data and lithospheric cooling models. The amplitudes of the predicted dynamic topography are reasonably small and the distribution of the main topographic extremes is basically opposite to the observation. This suggests that the circulation in the mantle is partially layered and the whole-mantle flowmodels should be rejected. The lithospheric plates are an important ingredient to include in the mantle flow modeling. They can produce a significant large-scale flow influencing both the dynamic topography and the stress distribution in the lithosphere.

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EMTESZ – First Electromagnetic Probing of the Trans-European Suture Zone

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The Trans-European Suture Zone (TESZ) divides the European continent into the Phanerozoic part in the west and Proterozoic part in the east. The EMTESZ project is directed towards a magnetotelluric study of this zone along several profiles preferentially coinciding with recently studied refraction seismic lines in Poland. The study aims at inferring the main features of the resistivity structure of the lithosphere–asthenosphere system by using modern broad-band magnetotelluric array measurements. We present results of pilot measurements carried out in 2001 and 2002 in the northwestern part of the TESZ in Pomerania. We focus on the quality of earth response functions with respect to man-made noise which may create considerable problems to MT soundings in Poland. Several long-period magnetotelluric measurements together with magnetovariational responses from the Belsk observatory give us a possibility to estimate the regional geoelectrical structure of the upper part of the mantle. These measurements show that, at the depth of about 8–25 km, a layer with an apparent anisotropy can be formally interpreted with the resistivity of about 6 Ohm-m along the TESZ and about 300 Ohm-m in the orthogonal direction, which correlates with the seismic zone of relatively low velocities. A preliminary model of the geoelectric structure of the crust across the TESZ is presented.

Detrital Cr-spinels in Culm Sediments and their Tectonic Significance

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Detrital Cr-spinel is an important component of heavy mineral assemblages. The chemical composition of spinel grains provides specific information about the source rocks types in different tectonic settings. Cr-spinel $(Mg, Fe^{2+})(Cr, Al, Fe^{3+})O_4$ is a ubiquitous accessory mineral in basalts and peridotites. Spinel composition reflects magma chemistry, the degree of partial melting and fractional crystallization (Cr and Mg partitioning into the solid, Al partitioning into the melt), temperature, fO_2 (ratio of Fe^{2+} to Fe^{3+}) (Yong, 1999). The Mg# in volcanic spinels reflects the cooling rate.

Detrital Cr-spinels were found in the heavy mineral assemblages of greywackes from the Drahany Culm. Spinel grains show significant variations in most important compositional parameters such as Mg#(Mg/Mg+Fe^{2+}), Cr#(Cr/Cr+Al), TiO_2 and Fe^{2+}/Fe^{3+}. These variations suggest multiple sources for spinel grains.