



Seismic anisotropy of the crust in the Trans-European Suture Zone, SE Poland – results of 3-D tomographic inversion

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In the area of Trans-European Suture Zone at the East European Craton margin in southeastern Poland (Malopolska and Lysogory Blocks), wide-angle seismic data from CELEBRATION 2000 experiment show strong azimuthal variation of Pg traveltimes and of observed crustal velocity, suggesting considerable anisotropy of the upper crust in this area. The axis of the fast velocity, trending roughly NW-SE, is consistent with the strike of the main tectonic lineaments in Malopolska and Lysogory blocks. Previously published anisotropic model of the crustal structure was based on the delay-time method which allows for robust but simplified calculation of the anisotropy. Current work presents models obtained by three-dimensional tomography with more realistic raytracing and regularized inversion algorithm. The model of a transversally isotropic medium was assumed. To assess credibility of the results, modelling of several subsets of the data was performed, and synthetic tests were carried out to evaluate the spatial resolution of the model. Obtained results confirm existence of substantial upper crustal anisotropy and provide an image of horizontal variability of the anisotropy magnitude in the study area. The result is consistent with the geological structure of the investigated units. In the MB and LB, tightly folded (dip 40-80 deg) metapelitic rocks of Neoproterozoic and younger age occur at depths of few km and deeper, and are likely to cause the observed anisotropy. Fast axis direction coincides well with azimuth of outcropping folds axes and other deformational structures. Therefore, observed anisotropy is interpreted as the effect of collisional deformations at the EEC margin.