



3D seismic traveltime tomography beneath the Pannonian basin: preliminary results

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The Pannonian basin and the surrounding orogens are located in central Europe and are parts of the Alpine-Carpathian orogenic mountain belts. This is a back-arc basin characterized by a thinned lower crust and an updoming mantle. Beneath the basin the Moho discontinuity is not deeper than 30 km and the lithosphere also has smaller thickness (~80 km) than the continental average. Imaging the velocity structure of the crust and upper mantle may help us to better understand the structure and formation of the Pannonian region.

In this study we have estimated the three-dimensional (3D) P-wave velocity structure and Moho geometry beneath the Pannonian Basin by analysing the seismic data from the ISC bulletin using the FMTOMO tomographic inversion software package. The inversion procedure applies the fast marching method for calculating the forward step, and the subspace inversion method to retrieve the model parameters.

In the inversion we used local, regional and teleseismic earthquakes as well. Altogether, we had more than 120 thousand P-wave arrival time data of more than 9000 seismic events from the time period between 2004 and 2014. The resulting 3D velocity image highly resembles the known geologic and tectonic structure of the area and is comparable to earlier tomographic images published in the literature. Also, the retrieved velocity anomalies correlate well with the Moho topography, the orogenic belts and the deep basins of the region.