



## **Lithosphere structure of the Pannonian Basin using seismic traveltime tomography**

Máté Timkó (1) and Zoltán Wéber (2)

(1) Department of Geophysics and Space Science, Eötvös Loránd University, Budapest, Hungary, (2) Kövesligethy Radó Seismological Observatory, MTA CSFK GGI, Budapest, Hungary

The extensional Pannonian Basin is situated within the convergent arc of the Alpine-Carpathian mountain system in Central Europe. This is a back-arc basin characterized by a thinned lower crust and an updoming mantle. Beneath the basin both the crust and the lithosphere have smaller thickness than the continental average. In this study we have estimated a 750 km long, 550 km wide and 80 km deep 3D tomographic model of the P-wave velocity structure and interface geometry of the crust and upper-mantle by inverting more than 19 thousand traveltime picks using the FMTOMO tomographic inversion software package. The inversion procedure applies the Fast Marching Method (FMM) for calculating the forward step, and the subspace inversion method to recover the model parameters. The traveltime picks are derived from the ISC bulletin and the local Hungarian National Seismological Bulletin, and altogether we used more than 3000 seismic events (local, near-regional and regional) from the time period between 2004 and 2014.

Synthetic tests were also carried out to help the interpretation of the resulting velocity model and to choose appropriate values for the inversion parameters.

The main features of the retrieved 3D velocity image highly resemble the known geologic and tectonic structure of the area (Moho topography, orogenic belts and the deep basins) and are comparable to recent tomographic models published in the literature.