



Travel Time Tomography of Europe with a Newly Compiled Data Set

M. Amaru (1), W. Spakman (1) and A. Villasenor (2)

(1) Department of Earth Sciences, Utrecht University, Utrecht, The Netherlands, (2) Institute of Earth Sciences "Jaume Almera", CSIC, Barcelona, Spain (amaru@geo.uu.nl / Phone: +31-30-2535076)

We have obtained a high-resolution P-wave velocity model for the crust and mantle beneath Europe. The travel time data set contains a subset of well located events from the ISC bulletins which consists of 16 million P-wave arrival times. Additionally, we picked 62000 travel times for temporary seismic experiments in Europe and the OR-FEUS archive. The picking was done with an automatic picker based on an adaptive stacking method. To obtain the velocity model, we performed a global travel time tomography. An irregular grid parameterization is used with cell sizes that depend on the ray density. Instead of a standard 1-D reference model, we started using a 3-D reference model for the mantle which is based on surface wave tomography. We account for ray bending due to 3-D heterogeneities in the mantle. Sensitivity tests show that in the uppermost mantle anomalies with wavelengths of 50 km horizontally can be reconstructed by the model while sensitivity to 3-D anomalies decreases with depth. Due to the newly compiled data set, more detail is seen particularly between 0 km and 400 km depth.