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Preliminary 3D S-wave velocity model of the European upper mantle from inversion of Surface and S waveforms.

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Tomography is the method of choice to determine a 3D image of the Earth‘s interior, and to draw conclusions on the thermal state of the upper and lower mantle. We present a preliminary 3D S-wave velocity model for the European upper mantle. It is calculated by Automated Multimode Inversion (AMI). Long period waveforms are automatically inverted for path average 1D S-wave velocity models that constrain the 3D S-wave velocity model of the upper mantle.

We used seismic data recorded during the last decades such as the Geoscope, IRIS, GEOFON, GRSN, and others that build the Virtual European Seismological Network (VEBSN). The increasing amount of data and stations allow to determine models with increased resolution. In the future, the calculated model will be used as a background model to develop a more detailed local tomographic model of the southern Aegean, using the EGELADOS dataset.

We have used about 600 events that occurred in Europe between 1990 and 2002 and for which the CMT moment tensors solutions are avaiable, and collected all available data. We thus obtained a dataset of about thirty thousand seismograms. The inversion produces more than 6000 1D path models, used to build a high resolution, 3D model of the European upper mantle.

Europe is a complex region, with many different structures, such as subduction (e.g. the Hellenic Subduction Zone), but also hotspots (e.g. Iceland). The main structures, such as the Tonquist Zone, the old subducted slabs, the Iceland hotspot, the Panonian basin, and other main structures such as the Afar plume, are clearly and well resolved. The model is presented using a number of cross sections, and map views. Resolution

tests are shown.