



P and S velocity anomalies in the upper mantle beneath Europe from tomographic inversion of the ISC data

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We present a new tomographic model for P and S velocity anomalies beneath Europe constrained from inversion of the ISC data. The algorithm uses the travel times from events located in the study area recorded by all available worldwide stations, as well as times from teleseismic events recorded by European stations. All the events from the ISC catalogue have been relocated and combined into composite events. All the travel times were corrected for the crustal structure based on a new reference model EuCRUST-07 (Tesauro et al., 2008). The resulting velocity anomalies seem to be well consistent with previous tomographic models (e.g. Bijwaard et al., 1998, Piromallo, Morelli, 2003). In this study we pay special attention to testing of reliability of the results. Random noise effect is evaluated using a test with independent inversion of two data subsets (with odd/even events). Spatial resolution is estimated using different checkerboard tests. Furthermore, we have created a model with realistic distribution of synthetic patterns. We performed consequent forward and inverse modeling for this model using the same inversion conditions as in the real case. The reconstruction model has the same shapes and amplitudes of anomalies as in the real data model. This modeling allows estimating true amplitudes of P and S anomalies in the Earth that is very important for evaluating the values of other petrophysical parameters in the upper mantle (temperature, density, composition etc).