Geophysical Research Abstracts
Vol. 12, EGU2010-5888, 2010
EGU General Assembly 2010

Toward a waveform tomography of the Hellenic Subduction Zone

S. Lamara, W. Friederich, and T. Meier

Ruhr Universität Bochum, Institut für Geologie, Mineralogie und Geophysik, Bochum, Germany.
(samir.lamara@ruhr-uni-bochum.de)

Our waveform tomographic investigation is intended to improve structural models of the Hellenic Subduction Zone and give a detailed insight into its different and complex properties using data of the temporary broadband EGELADOS network. An essential but difficult step towards this end is the determination of both source-receiver-path-specific 1D-earth models and the in most cases unknown focal mechanisms of the earthquakes.

The data used in our study was recorded from October 2005 to April 2007 corresponding to the period of deployment of the EGELADOS network. It involves seismograms recorded at land and ocean-bottom stations in addition to GEOFON stations. We select earthquakes that occured in the aegean region during this period with magnitude down to 4.1. Since most of these events were not studied before many difficulties arise in determining simultaneously the source parameters and preliminary 1D models.

We present a gradual approach permitting to bypass this issue by an iterative research of appropriate starting models leading to a better estimation of the earthquake source parameters. These results are then used to perform the waveform inversion which shows at the end a significant misfit reduction along with a better concordance with geology when compared with initial models.