Geophysical Research Abstracts
Vol. 14, EGU2012-4624, 2012
EGU General Assembly 2012

An upper mantle model for a western rim of the East European Craton

M. Dec, M. Malinowski, B. Nita, and E. Perchuc
Institute of Geophysics, Polish Academy of Sciences, Seismology, Poland (monikadec@igf.edu.pl)

The upper mantle structure is a subject of many seismological analysis but existent global models are often too general to depict regional variations. Our seismic model is a trial to construct a new reference model for the regional upper mantle structure in the western rim of the East European Craton. It is based on the P–wave traveltime analysis from seismograms recorded on Suwalki (SUW) seismic station belonging to the Polish Seismological Network. SUW station is situated in NE part of Poland on the East European Craton. The data from 249 natural seismic events were divided into four groups referring to the epicenters in the Western Mediterranean Sea region, Greece and Turkey region, Caucasus region and Mid-Atlantic Ridge region. Our analysis is based on the P-wave traveltimes observed up to 3000 km distance, which is sufficient to investigate upper mantle structure down to about 500 km. For each region, we established a single model which was fitted to all sections. 1D model was calculated for all regions except Jan Mayen region, for which we had to estimate 2D model because waves propagate through both oceanic and continental structure. However, the continental part of the Jan Mayen region model is similar to 1D model established for other regions. We also include data from TOR and SVEKALAPKO experiments to check the presence of the 300-km discontinuity.
Our model of the upper mantle in the western rim of the East European Craton documents low velocity zone (LVZ), 300-km discontinuity and zone with the reduction of P-wave velocity above 410-km discontinuity. We attribute the existence of the 300-km discontinuity to the paleotectonic interaction between Laurentia, Baltica and Avalonia during the closure of the Tornquist Sea.