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Determination of the lithospheric structure in the South-Eastern Carpathians Arc bend area using local earthquake data

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The main goal of this study is to investigate the lithospheric structure beneath Vrancea seismic area using local earthquakes. Vrancea area, located at the South-Eastern Carpathians Arc bend, is characterized by strong earthquakes generated at intermediate depths (60 – 170 km) in a complex geotectonic system. The tomography image obtained using teleseismic data (Martin et al., 2005; 2006) reveals a high-velocity body that extends significantly in depth, as well as laterally. The high-velocity region goes down to about 400 km depth or even more, well beyond the seismically active zone. In the present study we consider an updated and revised catalog with well-located events, occurred between 1982 and 2008 in Vrancea and nearby regions. The earthquakes were recorded by the National Seismic Network of Romania and during campaigns of intense observation by a denser temporary network. By inverting the P- and S-wave arrival time data using the tomography approach of Koulakov et al., 2007 we obtained a notable increase of resolution compared with previous tomography results. The high-velocity body revealed in this study is strongly reduced in extension and practically mimics the distribution of hypocenters.