Mapping the Moho in the Bohemian Massif with P-receiver functions

Hana Kampfová Exnerová1, Jaroslava Plomerová1, Jiří Kvapil1, Vladislav Babuška1, Luděk Vecsey1, the AlpArray-EASI Working Group2, and the AlpArray Working Group2

1Institute of Geophysics, Czech Academy of Sciences, Prague, Czechia (hke@ig.cas.cz)
2http://www.alparray.ethz.ch/

We present a new detailed map of the Moho in the Bohemian Massif (BM) derived from P-to-S conversions calculated from broad-band waveforms of teleseismic events recorded at 325 temporary and permanent stations operating in a region framed in 10–19º E and 48–52º N during last two decades. We processed data collected from running AlpArray Seismic Network (2015 – 2019) (http://www.alparray.ethz.ch/) and its complementary experiment AlpArray-EASI (2014 – 2015), as well as from previous passive seismic experiments in the region – BOHEMA I-IV (2001 – 2014), PASSEQ (2006 – 2008) and EgerRift (2007 – 2013). The study aims at upgrading the current knowledge of structure of the BM crust and providing a homogeneous estimate of Moho depths, particularly for the use in deep Earth studies, e.g., the upper mantle tomography. Different velocity models, including the new one retrieved from the ambient-noise study (see Kvapil et al., EGU2020_SM4.3), are tested in the time-depth migration procedures. Regional variations of the Moho depth correlate with main tectonic units of the BM. The crust thickens significantly in the Moldanubian part of the BM and thins along the Eger Rift in the western part of the massif. Detailed variations of the Moho depth from the receiver functions along several profiles are compared with crustal sections retrieved from the ambient noise tomography.