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Moho depth determination in the Eastern Alps-Pannonian basin-Carpathian mountains region based on H-K grid search method and CCP migration of receiver functions

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We perform P-to-S receiver function analysis to determine a detailed map of the crust-mantle boundary in the Eastern Alps–Pannonian basin–Carpathian mountains junction. We use data from the AlpArray Seismic Network, the Carpathian Basin Project and the South Carpathian Project temporary seismic networks, the permanent stations of the Hungarian National Seismological network, stations of a private network in Hungary as well as selected permanent seismological stations in neighbouring countries for the time period between 2004.01.01. and 2019.03.31. Altogether 221 seismological stations are used in the analysis. Owing to the dense station coverage we can achieve so far unprecedented resolution, thus extending our previous work on the region. We applied three-fold quality control, the first two on the observed waveforms and the third on the calculated radial receiver functions, calculated by the iterative time-domain deconvolution approach. The Moho depth was determined by two independent approaches, the common conversion point (CCP) migration with a local velocity model and the H-K grid search. We show cross-sections beneath the entire investigated area, and concentrate on major structural elements such as the AlCaPa and Tisza-Dacia blocks, the Mid-Hungarian Fault Zone and the Balaton Line. Finally, we present the Moho map obtained by the H-K grid search method and pre-stack CCP migration and interpolation over the entire study area, and compare results of two independent methods to prior knowledge.

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