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Receiver function analysis of the transition zone between the Pannonian Basin and the Southern Carpathians

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Receiver function analysis is performed for the southeastern part of the Carpathian Basin and the transition zone between Carpathian and Pannonian Basin, a rather complex region both geologically and geodynamically. In the analysis we used the data of 56 seismological stations including temporary broadband stations of the South Carpathian Project (SCP) and two permanent stations in Hungary. The SCP stations were operated between 2009 and 2011 (https://www.fdsn.org/networks/detail/YD_2009/). Receiver function studies have not been available neither in the investigated area nor in the project. We calculated receiver functions to determine the variation of crustal thickness across the basin and mountain along a NW–SE oriented swath about 600 km long and 90 km wide. We applied three-fold quality control, the first two steps being used for the waveforms and the third for the calculated radial receiver functions. The Moho depth was determined by two independent approaches, the common conversion point migration and the H-K grid search. The determined Moho depths show no significant change in crustal thickness between the AlCaPa and the Tisza-Dacia blocks, these values being between 22 and 29 kilometres, with the shallowest depths in the area of Great Hungarian Plain. Furthermore, we measured the Moho depth beneath Mid-Hungarian Zone, between the AlCaPa and the Tisza-Dacia blocks. The crust is thicker under the Apuseni Mountains (30-32 kilometres), and the Moho is deepest in the investigated region beneath the Southern Carpathians (33-43 kilometres). We also observed southeastward crustal thickness increase.