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Geometry of the Crust-Mantle boundary beneath the Dinarides

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The convergent boundary zone surrounding the Adriatic Sea represents the major component in the larger tectonic framework of the Mediterranean area. Dinarides, as a part of this convergence zone, are usually seen as the region where the interaction between Adriatic microplate and the Eurasian mainland was initiated. During the structural evolution of circum Adiratic area, Dinarides have remained one the key geodynamical factors, thus influencing larger scale tectonics. Hence, exploration of complex structural features below the Dinarides will directly improve overall understanding about the development of Central Mediterranean area. In this study we map seismic as well as structural attributes characterizing the crust beneath the Dinarides using non-linear inversion techniques of receiver functions. For this purpose we have acquired the data from 60 broadband stations located mostly in the External Dinarides. We employ receiver functions, both radial and transverse, to model lateral variations in lithospheric structure including the geometry of the interface between crust and mantle (e.g. Moho dip).
Thick crust (>40 km) is observed beneath the Dinaric high elevation zone with thickness decreasing towards the Pannonian Basin. Particularly deep Moho interface is observed in the central and southern parts of the study area, reaching depths in excess of 50 km. More dense station coverage in the NW Dinarides allowed us to discern relatively sharp transition between thick Adriatic crust and shallower European Moho. The synthesized picture of the Moho geometry obtained by combining results from receiver function profiles and waveform inversion reveals opposite dipping directions in respect to general NW trending axis of the Dinaric mountain chain. On the Adriatic side, Moho is dipping towards NE while on the Pannonian side, the dip direction switches to W-SW. The trend of the dipping Moho can be constructed to infer that the two colliding plates converge immediately east of high elevation zone.