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The interaction between the Adria and Europe plates at their boundary in the Eastern Alps (project EASI)

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Project EASI is the first implemented Complementary Experiment within the AlpArray program (http://www.alparray.ethz.ch) and stands for Eastern Alpine Seismic Investigation. The seismological field experiment ran with 55 broadband stations deployed in zigzag in a ca. 15 km-wide band along longitude 13.35°E, spanning 540 km from the Czech-German border to the Adriatic Sea, for a duration of one year (Summer 2014-Summer 2015).

Here we present the results obtained by P-to-S conversions from waveforms of teleseismic earthquakes. Depths of Moho and other interfaces, velocity structure and Vp/Vs are imaged with the use of different approaches – depth migrated receiver functions, manual time picks converted into interface depths, H-K method (Zhu and Kanamori, 2000), harmonic analysis, etc. – together with an estimate of their reliability. The Moho beneath the Bohemian Massif is relatively sharp and distinct until the Bavarian Shear Zone. Further to the south the Moho is less pronounced and several dipping segments can be followed between individual faults on the depth migrated images. In general, the European Moho deepens from north to south, i.e. from the Bohemian Massif to the Alps, until reaching a steeply dipping ramp-like structure beneath the Tauern Window. On the other hand, the Adriatic Moho deepens from south to north towards the Tauern Window, beneath which we observe weak conversions. There is no sign indicating the previously reported Moho gap. The size of this "gap" seen in active seismics (by PmP phases) will be investigated by further receiver function inversions to determine the characteristics of the crust-mantle velocity transition. At the boundary between the two plates, the whole crustal structure looks complex, holding several Ps converted phases. We isolate the signal generated by inclined interfaces and anisotropy through the application of the harmonics decomposition. At finer crustal scale, the presence of anisotropy is related to the underthrusting of the crystalline basement and syn-orogenic sediments. Further information on the average crustal structure are unravelled from the variation of Vp/Vs along the profile. Finally, preliminary results on S-to-P conversions illuminating the lithosphere-asthenosphere boundary map its significant depth variation along the EASI transect and complement our crustal study.