

The European/Adriatic lithosphere contact in the Eastern Alps

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Convergence between the European and African plates caused the formation of the Alps and the neighbouring mountain belts – i.e. the Carpathians, Apennines and Dinarides – after oceanic subduction and continental collision. Here we focus on the Eastern Alpine realm and on the Variscan Bohemian Massif which adjoins the Alps to the north. We present tomography images of seismic velocities in the lithosphere and the upper mantle, as well as seismic anisotropy along a ca.200 km broad, ca.500 km long north-south transect crossing the Bohemian Massif in the north and the East-Alpine root up to the Adriatic Sea in the south. The study is based on teleseismic body-wave data from the AlpArray-EASI complementary experiment (2014-2015) and the AlpArray Seismic Network. Tomography images the steeply northward dipping East-Alpine root, dominated by the Adriatic plate, steady southward thickening of the lithosphere beneath the Bohemian Massif and distinct regional variations of mantle lithosphere fabrics modelled in 3D, implying complex domain-like architecture of the collisional zone of the European/Adria plate beneath the Alps. Ongoing studies of seismic velocities and seismic anisotropy indicate a dominant role of the mantle lithosphere in the orogenic processes and improve our understanding of the mantle dynamics of the complex Alpine region and its surroundings.