



Mantle anisotropy across the Eastern Alps – Bohemian Massif contact zone imaged by shear-wave splitting

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Waveforms recorded during the passive seismic experiments AlpArray-EASI (2014-2015) and AlpArray Seismic Network (2016-2019) are used for structural studies of the upper mantle beneath the Bohemian Massif and the Eastern Alps. We evaluate splitting of core-mantle refracted shear waves (SKS) and their particle motions (PM) at 188 broad-band stations in about 200 km broad and 540 km long band along 13.3° E longitude to model the large-scale anisotropy in the mantle lithosphere.

The processing includes automated pre-processing (wave identification, filtering and quality check) and applying several different splitting methods (eigenvalue, transverse energy and spectral approach) to be able to employ also events with lower signal-to-noise ratio. To improve results of splitting analysis, we also consider SKS wave with null or close to null splitting, dynamic back azimuths, and analyse and correct data for seismometer mis-orientations.

Evaluated shear-wave splitting parameters as well as particle motions are consistent within sub-regions and exhibit significant and often sudden lateral changes across the whole region. We relate such changes to sharply bounded anisotropic domains with uniform fossil fabrics in the mantle lithosphere of the Eastern Alps, the Bohemian Massif and their contact zone.