

Deformation Under the Alps from SKS Shear-Wave Splitting

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Seismic anisotropy is the dependence of seismic velocity on direction of wave propagation. Measurement of seismic anisotropy allows inferring (past and present-day) deformation and dynamic processes in crust and upper mantle under the Alps.

A useful method for constraining upper mantle anisotropy is SKS/SKKS shear wave splitting, which gives the two splitting parameters, fast direction azimuth (Φ) and arrival time delay between fast and slow phases (δt). In this study we measure splitting parameters from 12 permanent stations of the Austrian Seismic Network (OE) using the SplitLab package (Wüstefeld & Bokelmann, 2007). Our shear wave splitting results show good agreement with previous studies in the central Alps but fast directions are different in the eastern Alps. The difference in seismic anisotropy, and thus deep deformation, between western, central and eastern Alps is striking, namely the progressive rotation along the Alpine belt.