



## **Slab detachment under the Eastern Alps seen by seismic anisotropy**

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We analyze seismic anisotropy for the Eastern Alpine region by inspecting shear-wave splitting from SKS and SKKS phases. The Eastern Alpine region is characterized by a breakdown of the clear mountain-chain-parallel fast orientation pattern that has been previously documented for the Western Alps and for the western part of the Eastern Alps. The main interest of this paper is a more detailed analysis of the anisotropic character of the Eastern Alps, and the transition to the Carpathian-Pannonian region. SK(K)S splitting measurements reveal a rather remarkable lateral change in the anisotropy pattern from the west to the east of the Eastern Alps with a transition area at about  $12^{\circ}\text{E}$ . We also model the backazimuthal variation of the measurements by a vertical change of anisotropy. We find that the eastern part of the study area is characterized by the presence of two layers of anisotropy, where the deeper layer has characteristics similar to those of the Central Alps, in particular SW-NE fast orientations of anisotropic axes. We attribute the deeper layer to a detached slab from the European plate. Comparison with tomographic studies of the area indicates that the detached slab might possibly connect with the lithosphere that is still in place to the west of our study area, and may also connect with the slab graveyard to the East, at the depth of the upper mantle transition zone. On the other hand, the upper layer has NW-SE fast orientations coinciding with a low-velocity layer which is found above a more-or-less eastward dipping high-velocity body. The anisotropy of the upper layer shows large-scale NW-SE fast orientation, which is consistent with the presence of asthenospheric flow above the detached slab foundering into the deeper mantle.