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Crustal anisotropy and deformation in the Eastern and Southern Alps

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Mapping crustal seismic anisotropy provides insight into tectonic deformation via the in-situ fabric alignment, as well as stress orientation. This is of particular interest for the upper crust. We study the crust of the eastern part of the Alpine chain, which is considered to be an area of complex tectonics. Nevertheless, little has been done so far to constrain anisotropy and deformation at the crustal scale in this region. In this study, we use dispersion curves of Rayleigh and Love-waves derived recently from cross-correlations of ambient noise data that were collected from over 90 permanent and temporary seismic stations in the eastern Alps. The dispersions measurements are jointly inverted to derive an anisotropic shear-wave velocity model. This new anisotropy model presents high spatial and vertical resolution for the eastern Alps, and it allows us to constrain the radial anisotropy patterns in the region. In addition, the surface waves are used to derive azimuthal anisotropy which, together with the former results of SKS splitting (at the upper mantle scale), provides an improved image of azimuthal anisotropy amplitudes and fast directions in the region. All together, these new results help to discuss the strain field and deformation pattern, in relation to the most prominent tectonic processes in the region, such as the eastward extrusion of the Alcapa block. Updated results will be presented at the meeting.