



Correlated crustal and mantle deformation in the Tauern Window, Eastern Alps

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We study the coupling between crust and mantle in a convergent regime, by comparing measures of upper mantle deformation with indicators of crustal deformation. We use shear-wave splitting parameters, in particular the orientation of fast axes in the upper mantle measured from data recorded at 8 broadband stations located within the Tauern Window. These are compared with kinematic indicators in the Tauern Window region of the eastern Alps at the outcrop scale. Our results show a striking parallelism between the upper mantle and crustal patterns, indicating vertical coherence of deformation all the way between the crust and the mantle lithosphere. The new findings suggest a vertical coherence of deformation of crust and upper mantle, particularly in the western part of the Tauern Window. Similar pattern in our results and indentation models indicate that the effect of the Adriatic indentation acts on the European lithosphere, not only at crustal but also at lithospheric mantle depths. We discuss the implication of this vertical coherence for the question of mechanical coupling.