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Temperature distribution in the Eastern Alps from teleseimic tomography

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The Eastern Alps were formed by the north-south directed collision of the Adriatic (African) and European plates and a subsequent tectonic escape of crustal fragments to the unconstrained margin in the east, represented by the Pannonian Basin. In the framework of the project ALPASS, a passive seismic monitoring project, that builds on results of the former 3D WAR/R-experiments CELEBRATION 2000 and ALP 2002, the structure of the lower lithosphere and upper asthenosphere beneath the wider Eastern Alpine region was revealed. A tomographic image of the upper mantle was generated between 60 km and 500 km depth and two different slabs were indicated. A steeply to vertically dipping slab below the Eastern Alps ("shallow slab") was resolved down to a depth of $\sim$250 km, which was interpreted as European lower lithosphere detached from the crust and subducted during post-collision convergence between Adria and Europe. Between 350 km and 400 km depth, another slab was indicated from below the central Eastern Alps to under the Pannonian realm ("deep slab"). It was interpreted as subducted oceanic lithosphere of the Alpine Tethys. From the tomographic image a reduced continuity in the shallow slab at longitude $\sim$12°E was observed. The easternmost part of the Alpine shallow slab overlaps with the deep slab and a connection between these two slabs between 13°E and 15°E might be interpreted from the interpretation of the calculated model. To shed light on the questions of connections between the slabs, several synthetic models were calculated and finally a possible temperature distribution in the slabs and the surrounding mantle was considered in view of seismic velocities.