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A 3D anisotropic seismic velocity model of the Eastern Alps from reflection and refraction traveltime tomography

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The crustal structure of the Eastern Alps was the target of Deep Seismic Sounding (DSS) surveys in 1998/99 (TRANSALP) and 2002 (ALP 2002). The reflection and refraction seismic TRANSALP transect provides high resolved 2D models at the Western end of the Tauern Window (12°E). ALP 2002 covers the greater Alpine area between 12°-18°E, and consists of a network of 13 stationary lines recording 39 controlled sources. In order to link the two surveys, stations were redeployed along the TRANSALP line during the ALP2002 experiment. First results from ALP 2002 observations on the TRANSALP line showed that the p-wave velocity model along TRANSALP is consistent with the new data within ˜150 km of the profile, when anisotropy in the Tauern Window is taken into account. An anisotropy factor of 10% with the fast axis oriented E-W, as obtained from previous studies, can be confirmed. It results in azimuthal traveltime differences at long offsets of several hundreds of milliseconds. The aim of this work in progress is to derive a 3D velocity model for the Eastern Alps by traveltime inversion including anisotropy. Although the data is too sparse to invert for anisotropy, it should be taken into account during forward modeling. East Alpine DSS data from the 70's are also included in the inversion to increase coverage and to obtain a model consistent with all available data. Pg, PmP and Pn traveltimes are inverted simultaneously for velocities and Moho depth. Preliminary results for the area between 12°-14°E indicate a south directed subduction of European (Penninic) below Adriatic (Apulian) crust, with the suture located south of the central crest.