3D STRUCTURE OF THE EASTERN ALPS FROM DEEP SEISMIC WIDE-ANGLE DATA

Bleibinhaus, F.[1)], Behm, M.[2)], Brückl, E.[2)], ALP 2002 Working Group
[1)] University of Munich, Department of Earth and Environmental Sciences, Theresienstr. 41, 80333 Munich, Germany, Tel. +49 89 2180 4202, Fax -4205, bleibi@geophysik.uni-muenchen.de
[2)] Inst. of Geodesy and Geophysics, Vienna Tech. Univ., Gusshausstr. 27-29, 1040 Vienna, Austria

The Eastern Alps of Europe were 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 East Alpine area, and consists of a network of 13 stationary lines with a total length of 4300 km recording 39 controlled sources. A variety of techniques from 2D forward modeling to 3D tomographic inversion and stacking was applied to take advantage of the spatially varying resolving power of the data. Older East Alpine DSS data from the 70'ies were included in the inversions to increase coverage and to obtain consistent models. This study focuses on a 3D velocity and Moho model for the Eastern Alps within a region of 300 km x 400 km from simultaneous traveltime inversion of refracted and reflected phases considering anisotropy. Observations of ALP 2002 shots on the TRANSALP line have shown that the first order p-wave velocity structure along TRANSALP is consistent with the ALP 2002 data within ~150 km towards the East when 10% anisotropy in the Tauern Window are taken into account. Results for the area between 12°-14°E indicate a south directed subduction of European below Adriatic crust, with the suture located south of the central mountain crest. The maximum Moho depth of 50-55 km in the central Eastern Alps decreases to less than 30 km in the Pannonian Basin at ~ 14.5°E. The apparently discontinuous nature of this change in crustal thickness indicates the existence of a separate Pannonian plate fragment.

Submittal Information

Corresponding Author: Florian Bleibinhaus, University of Munich, Department of Earth and Environmental Sciences, Geophysics Section, Theresienstr. 41, 80333 Munich, Germany,
Tel. +49 89 2180 4202, Fax -4205, bleibi@geophysik.uni-muenchen.de

Topics: 2. Intra-continental collision and accretion, 7. Numerical modeling of heterogeneity and anisotropy

Additional equipment: None

Presentation: Poster