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ACCURACY AND RESOLUTION OF A 3D SEISMIC MODEL OF THE EASTERN ALPS

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A 3D seismic model of the Eastern Alps and the surrounding forelands has been obtained from data of the two large refraction seismic campaigns CELEBRATION 2000 and ALP 2002. Signal detection and stacking to common midpoint and common source/receiver bins were applied in order to enhance the signal to noise ratio. The P-wave velocity model of the crust was generated by 1D tomographic inversions at each common midpoint bin. Moho depth and Pn-velocity were determined on the basis of the delay time method. The limitations of this method were overcome by downward continuation of shot and receiver points according the survey sinking concept.
In order to check the accuracy of the model a dataset of reliable traveltime picks (Pg and Pn) was generated. These observed data are compared with traveltimes calculated by 3D ray tracing. For the crust the traveltime differences were decomposed to various geometry parameters like shot, receiver, offset and common midpoint. Additionally, a 3D diving wave tomography for the Pg-phase was carried out using the reliable traveltime picks for the purposes of comparison and model refinement. The Moho delaytime model was analyzed using resolution and covariance matrices addressing resolution and accuracy. As with the crust, the possibility of model refinement by implementing the traveltime picks was investigated.