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Crustal structure in eastern Austria from ALP 2002 in-line data – preliminary results

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Aim of this investigation is a detailed determination of a crustal seismic model for P velocity and Moho depth in the eastern part of Austria. The study area is located in the Eastern Alps consisting of the alpine foreland, the Styrian-Lower Austrian Calcerous Alps, the Greywacke Zone and the eastern most part of the Central Alps.

For the study of the crustal structure travel-times were picked for in-line recordings from the lines ALP04, ALP05, ALP08 and ALP09. The seismic sections show clear first arrivals up to distances of 100-150 km. The crossing points of these four lines (SP503: 46.83°N, 14.96°E; SP504: 47.49°N, 15.61°E; ALP04/08: 48.0°N, 15.1°E, ALP04/09: 47.5°N, 14.6°E) span a rhombus shaped area with side lengths of 60 to 90 km. On these lines the station spacing is around 6 km except for line ALP04 (around 10 km).

2D models were built using raytracing modelling. In the first step the individual lines were interpreted. Only on line ALP05 shot and reversed shot exist for the rhombus segment. In the case of lines ALP08 and ALP09 a far shot on line ALP01 could be included for the modelling. For line ALP04 there is only one shot point on the far south-western end near the Austrian-Italian border. In a second step the information at the profile intersections was taken into account for model improvements. Additionally results from line ALP10 – with small station spacings of around 3 km – were included. This line, that is deployed mainly in the Greywacke Zone, divides the study area into two triangles. The northern triangle comprises the Calcerous Alps (Upper Austroalpine) and the southern triangle covers mainly the Central Alps (igneous and metamorphic rocks).

The thickness of the crust varies between 30 and 50 km in the investigated area.