

The Lithosphere-Asthenosphere Boundary Topography across West and Central Europe - from the Eastern European Craton to the American Massif " (LABTOP)

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The dominant static (as in over long geological time scales) control on regional topography is arguably the topography of the lithosphere-asthenosphere boundary. Such Airy isostasy accounts for thick lithosphere beneath mountain belts, and thinner lithosphere beneath the plains. However, the surface topography in many continental regions is a response to dynamic processes active on (relatively) fast geological time scales, and this dynamic topography is often not correlated in a simple manner with the depth to the lithosphere-asthenosphere boundary (LAB). The purpose of this Coordinated Research Project is to map with high resolution the LAB, using geochemical and geophysical methods, in the Western European-Central European Platform (WECEP) region, and compare and contrast the results with the surface topography with the overarching goal of elucidating dynamic Earth processes. Of special importance is the determination of the degree of agreement with the original mechanical definition of the LAB and the geochemical and geophysical observations.

To undertake this daunting task, we have assembled a group of eleven PIs from across Europe who individually are experts in their fields and who have demonstrated track records of integrating their results with those from other sub-disciplines. New data will be acquired, and added to the existing data. All will be analysed using modern methods, and integrated interpretations will yield images of the WECEP lithosphere hitherto unknown.

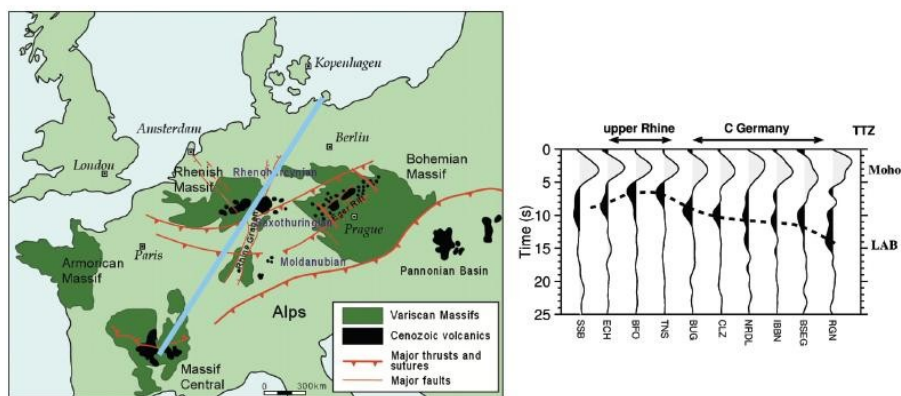


Figure 1: Left: Central European Cenozoic Igneous Provinces. Right: Examples of S-P-receiver function data along the profile indicated on the map. Thinning of the lithosphere beneath the Upper Rhine Graben and its thickening towards the TTZ is evident (Time scale multiplied by a factor 9 gives roughly the depth scale).

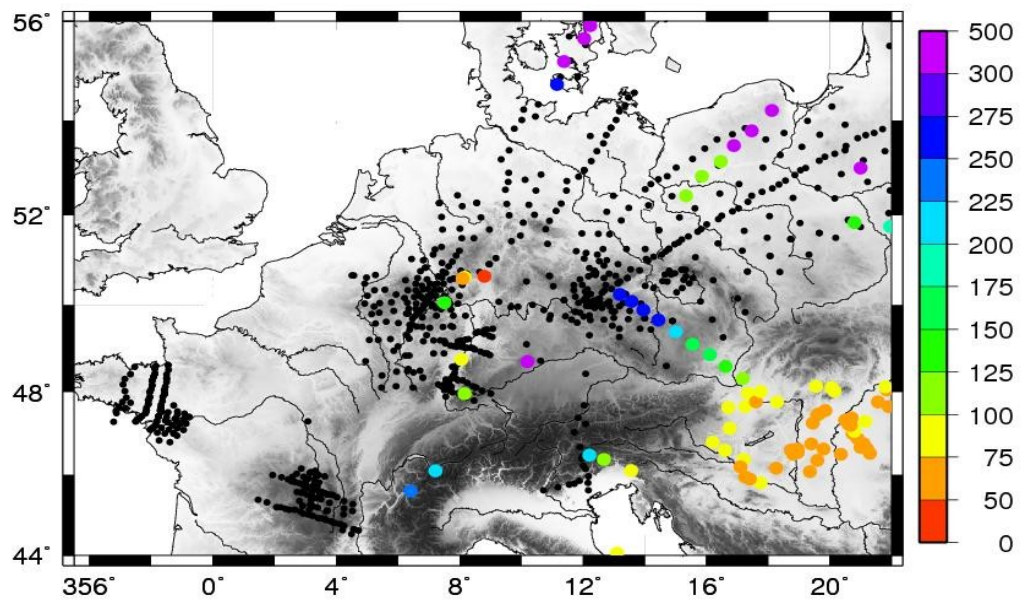


Figure 2: Map of temporary seismological stations deployed previously in the region of WECEP, and the depth (in km) to the LAB defined by MT (from Korja, 2007), on the grey-shaded topography