MOHO DEPTH VARIATION IN THE WESTERN-CENTRAL ALPS FROM TELESEISMIC RECEIVER FUNCTION ANALYSIS

D.Lombardi, J.Braunmiller
Institute of Geophysics, Swiss Federal Institute of Technology, ETH Hoenggerberg, Zurich, Switzerland
e-mail : denis.lombardi@sed.ethz.ch

The Western-Central Alpine region is tectonically complex due to Eurasia-Africa collision. To better constrain the Alpine crustal and upper-mantle structure, we have initiated the TomoCH project. In collaboration with other European institutes, we are installing about 10 temporary broad-band stations surrounding Switzerland. For receiver function analysis, we used data from these temporary stations and from 37 broad-band and 8 5s-sensors operated by several permanent European seismic networks. We applied a stacking procedure, which uses the timing of the primary P-to-S and the later multiple converted phases, to estimate simple models of crustal thickness and Vp/Vs ratio for each station. To reduce the velocity-thickness trade-off, we constrained average crustal Vp using a regional controlled-source seismic model. We estimated parameter uncertainty based on bootstrap analysis. Our preliminary results indicate that the Moho depth is better constrained than the Vp/Vs ratio. Crustal thickness values increase from 25 km in the northern Alpine Foreland to about 50 km beneath the southern Swiss Alps with a general dip towards the SSE direction. We obtained stable and consistent results for the Alpine Foreland where the Moho dips gently. In contrast, in the Alps proper and close to the assumed European-Adriatic plate transition, the Moho dip increases and our results show some spatial variations. Whether these variations are real or artefacts due to the complicated crustal structure and steeply dipping Moho, which are not accounted for by our simple stacking procedure, is presently unresolved.

Session : SCD-1
Presentation : oral
Requests : overhead projector, video beamer