



Heterogeneities of the upper mantle and the lithosphere in central and eastern Europe as seen by teleseismic receiver functions

W.H. Geissler (1), R. Kind (2,3) and X. Yuan (2)

(1) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany, (2) GeoForschungsZentrum, Potsdam, Germany, (3) Freie Universität Berlin, Germany
(Wolfram.Geissler@awi.de)

Data from 90 permanent broadband stations spread over central and eastern Europe were analysed using Ps receiver functions to study the crustal and upper mantle structure down to the mantle transition zone. Receiver functions provide valuable information on structural features, which are important to resolve central questions of European lithospheric dynamics. Moho Ps delay times vary from less than 3 s (25 to 30 km depth) in extensional areas in central Europe to more than 6 s (50 to 60 km depth) at stations on East European Craton and beneath the Alpine-Carpathian belt. v_p/v_s ratios range from 1.60 to 1.96 showing no clear correlation to the major tectonic units, probably representing more local variations in crustal composition. Delayed arrivals of converted phases from the mantle transition zone can be observed at many stations in central Europe, whereas stations on the craton show significant earlier arrivals than calculated from IASP91 velocity model. Differential delay times between the P_{410s} and P_{660s} phases indicate a thickened mantle transition zone beneath the eastern Alps and in the whole region of the northern Balkan peninsula/Pannonian Basin, whereas the transition zone in central and eastern Europe agree closely with the IASP91 value. The thickening of the mantle transition zone beneath the eastern Alps and the Carpathians might be caused by cold, deeply subducted oceanic slabs.