



Deep structural differences beneath Southern Norway and Northern Jutland from teleseismic P-wave residuals - Preliminary results

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Differences in the seismic velocity structures in the mantle lithosphere and asthenosphere are investigated by analysis of differences in P-wave arrivals from distant earthquakes to stations in Southern Norway and the northern part of Denmark. Differences in P-wave residuals have the potential of distinguishing between deep structural differences in different tectonic units.

The study area covers the southwestern part of the Baltic Shield and the southern part of the Scandinavian Caledonides (Southern Norway), the northern part of the Sorgenfrei-Tornquist Zone and the northern part of the Norwegian-Danish Basin.

The origin of the Norwegian mountains is still debated, and some of the posed hypothesis can be investigated using P-wave residuals. Lithospheric delamination or a mantle plume should both result in late arrivals compared to the surrounding Baltic Shield, whereas a deep lithospheric root causes early arrivals. The TOR project reveals a sharp transition across the Sorgenfrei-Tornquist Zone between the Baltic Shield in Southern Sweden with a thick lithosphere and the Norwegian-Danish Basin with a thinner lithosphere. Earlier studies of Rayleigh-waves indicate that a similar transition may exist between Southern Norway and the Norwegian-Danish Basin.

The region of Southern Norway is covered by a total of 35 mobile stations (intermediate period as well as broadband stations also used for receiver functions) covering different areas and time intervals between 2002 and 2005. About 15 permanent

network stations are also considered. In the northern part of Denmark, one permanent station was present, and four mobile stations have so far been deployed during most of 2005. Preliminary data analyses show significant lateral differences in P-wave residuals within the study area. The structural and tectonic implications of observed differences are discussed.