



## **Upper mantle structure beneath the Southern Scandes Mountains and the Northern Tornquist Zone - results from teleseismic P-wave travel time tomography**

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Structure and dynamics of the upper mantle is important in understanding timing and mechanisms shaping present day topography and near surface geology.

Debate persists regarding the geological age of the Scandes Mountains. We contribute by imaging upper mantle structure beneath southern Scandinavia using teleseismic P-wave travel time tomography (P-tomography).

We include data from mobile stations deployed in projects CALAS, CENMOVE, MAGNUS, SCANLIPS and Tor. Permanent stations included are those available from the University of Uppsala, NORSAR and GEUS.

P-wave arrival times generally show differences of up to 1 second across the study area.

Upper mantle velocities are relatively high in southern Sweden and southern Norway east of the Oslo Graben. Lower velocities are observed in the Norwegian-Danish Basin southwest of the Sorgenfrei-Tornquist Zone (STZ) and in the southwestern part of Norway.

We interpret the southwestern boundary of thick Baltic Shield lithosphere where we observe the highest horizontal P-wave velocity gradient. Thus, we find the boundary of thick lithosphere to more or less coincide with the STZ in the southeastern part of the study area, extending from southern Sweden into the northern part of Jutland. From here it turns north, passing through the Oslo Graben area to about 60°N then turning northwest, approaching the Norwegian west coast around 65°N.

Thus, as compared to Baltic Shield, upper mantle velocity is significantly reduced beneath deep sedimentary basins of Denmark and northern Germany.