



Indications for complex anisotropy beneath Scandinavia derived from shear wave splitting analysis

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Within the framework of the seismological ScanArray project (~150 temporary and permanent stations) we perform a shear wave splitting (SWS) analysis to study the signatures of anisotropic structures across the different geological units of Scandinavia. For this purpose we use core-refracted shear waves (SKS, SKKS, PKS) from teleseismic earthquakes and combine standard SWS techniques with stacking procedures to improve the backazimuthal (BAZ) coverage. Compared to previous studies in Scandinavia, for several regions we obtain an enhanced spatial resolution of the anisotropic pattern due to the dense recording network and the stacking procedures.

Although, in general the pattern of the splitting parameters, fast polarisation direction (ϕ) and delay time (δt), coincide with those of previous studies, at several recording stations there are strong variations in the determined SWS parameters with BAZ as well as discrepancies between SKS and SKKS measurements for the same event. This observation indicates that the source of anisotropy is quite complex with possibly contributions from both, lithospheric and deeper mantle structures. Layer models with one or two anisotropic layers are not able to explain all of our observed SWS parameters with high reliability. This finding points towards lateral variations which are related to different geological units.