



Analysis of waves converted from S to P in the uppermost mantle of the Baltic shield

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Teleseismic data recorded by broadband stations in the Swedish National Seismological Network have been used in a study of waves converted from S to P in the uppermost mantle. S to P converted waves are recorded as precursors to the S arrival. This enables us to study discontinuities at depths of 100-300 km where the traditional receiver function technique based on P to S conversion will fail due to crustal multiples.

We have selected 1050 good quality seismograms from events in the distance range $67^\circ - 95^\circ$. To identify precursors from S to P converted waves, we deconvolve the radial horizontal component from the vertical. This is done at negative timelags. In practice, traces were reversed before deconvolution. To image possible discontinuities at depths down to 260 km, amplitudes of the deconvolved seismograms are migrated to the position of corresponding S to P conversions. The depth migrated amplitudes are then projected onto a 2-D profile along the network. Averaging is performed with a depth dependent window length. This is done to enhance low amplitude coherent signals and also to account for uncertainties in spatial position from depth migration of amplitudes.

The images produced using this technique show several coherent structures at depths 100-260 km. The most conspicuous are a series of north dipping structures extending for more than 1200 km at depths 130-230 km. We believe that together with results from tomography and refraction studies, these observations may be helpful in the interpretation of upper mantle structures such as the lithosphere-asthenosphere boundary. It can be noted that several features of the images are in very close agreement with interpretations based on the FENNOLORA refraction dataset.