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VI.4 Upper mantle seismic heterogeneities beneath Fennoscandia

Three-dimensional seismic mapping of the upper mantle beneath Fennoscandia (Baltic Shield) using an ACH-type of inversion technique in combination with P-wave travel time residual observations from the local seismograph network gave the following results. The central parts of the Baltic Shield are characterized by relatively high seismic velocities down to approximately 300 km. Those parts of the shield most affected by the Caledonide orogeny exhibit relatively low velocities particularly in the uppermost 100 km depth interval. The lower part of the upper mantle (300-600 km) does not exhibit pronounced seismic velocity anomalies and in this respect is in contrast to results from similar studies in regions subjected to neotectonic processes like parts of central and southeastern Europe. The seismic anomaly pattern in the presumed thickened lithosphere is in quantitative agreement with similar ones derived from surface wave dispersion analysis and inversion of electrical measurements. The general orientation of these anomalies coincides with that of the glacial uplift. A comprehensive description of this work can be found in a recent paper by Husebye and Hovland (1982).

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Reference

Husebye, E.S. and J. Hovland (1982): On upper mantle seismic heterogeneities beneath Fennoscandia. Tectonophysics, in press.