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Insights into the lithospheric structure beneath the Central Scandes from combining different geophysical observations

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We present the lithospheric structure below the Central Scandes by combined interpretation of seismic, magnetotelluric, gravity and magnetic data, and discuss its link to epeirogenic uplift.
Receiver functions have been calculated from teleseismic events recorded by an array of seismometers deployed on an E-W transect between the coasts of central Norway and Sweden within the SCANLIPS experiment. Forward and inverse modelling of the receiver functions and migration yields a model for the subsurface velocity structure along the profile which has the crust thickening from c. 32 km at the Norwegian coast to c. 43 km beneath the central Scandinavian mountain range and then remains constant beneath Sweden. A high velocity lower crust underlies much of Sweden and thins beneath Norway. The presence of this high velocity, high density layer results in low topography above a thick crust, and is necessary to explain the gravity anomalies and to achieve an isostatically balanced system.
A recent magnetotelluric study along the same profile shows a low-resistive zone in the upper mantle that coincides with high topography and the surface extent of the Trans-Scandinavian Igneous Belt, which is expressed in a prominent magnetic anomaly high. This indicates that topography and near-surface geology have a complex interaction with the structure of the lithosphere.