



Geophysical investigations of the East Greenland Caledonides using receiver functions, gravity and topography data

C. Schiffer, B. H. Jacobsen, N. Balling, and S. B. Nielsen
Department of Geoscience, Aarhus University, Århus, Denmark

The present-day topography and crustal structure of the East Greenland Caledonides are a product of various events, including the Caledonian orogeny, lithospheric extensional collapse, continental breakup and erosional processes. The topographic elevation appears high in this region, still after considering erosional uplift, connected to fjord formation. This apparent longevity of topography remains a matter of discussion.

In this context the relationship of topography to crustal thickness and isostasy is a central aspect. Erosion and possible subcrustal processes are of further importance. Shallow crustal structures related to extensional basin formation, a lower crustal high velocity layer and a crustal root have to be considered.

A profile of 11 temporary broadband stations was deployed and maintained by Aarhus University for a period of 2 years (2009 – 2011). The approximately 270 km long Ella Ø array crosses the East Greenland Caledonides from the ice sheet to the coastline at about 73° north. The data are of high quality.

Initial Receiver Function results are interpreted together with corresponding gravity and topography data and additionally compared with synthetic data, using velocity models from published wide-angle seismic studies in the area.

The evolution of the East Greenland and Norwegian Caledonides at the conjugated margins may be closely connected. A comparison with a similar study in Norway will give insight to what extend topography, crustal and upper mantle structures on both sides correlate and display similarities as well as a common evolution and tectonic origin.