

Deep lithosphere studies in Greenland on trace of Iceland plume.

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First results are now available from an extensive teleseismic experiment aiming to uncover the seismic velocity structure of the Greenland shield and upper mantle from 62° N to 77° N. The study area is important to the understanding of the break-up and opening of the North Atlantic approximately 61 Myr ago, and the role of the Iceland plume prior to the break-up. It has been proposed that the flood basalts on and around the Disko Island on the West coast and at the Blossville Coast in East Greenland are early manifestations of the Iceland plume. Very little is known about the lithosphere structure under the Greenland ice sheet. The availability of geological data is restricted to the continental margins, and explosion seismic investigations have exclusively taken place there. Existing seismological data show no plume trace, but through earthquake recording on broadband seismometers placed both in the interior of the icesheet and along the coasts of Greenland we can sample regions that are unlikely to be affected by the mantle plume, as well as a region with a proposed plume impact and track. The dispersive nature of surface waves is used to obtain the average seismic velocity as a function of depth between pairs of stations. We here present broadband data and preliminary results from a pilot study consisting of data from one station on the icesheet and three newly established permanent stations in Greenland.