



Crustal structure of the Greenland-Iceland Ridge inferred from wide-angle seismic data

Sönke Reiche, Ian Reid, and Hans Thybo

Department of Geography and Geology, University of Copenhagen, Øster Voldgade 10, 1350 København K, Denmark
(sor@geo.ku.dk)

The east Greenland rifted volcanic margin has been widely associated with the presence of flood basalts, seaward dipping reflectors and anomalously thick oceanic crust. Such observations are considered diagnostic criteria for vigorous volcanic activity during the opening of the North Atlantic Ocean and the creation of the North Atlantic Igneous Province. The volcanic nature of the east Greenland margin is particularly evident at the Greenland-Iceland Ridge which might have been formed along the migration track of the hotspot at Iceland. Here, we present the results from modelling of a 500 km long wide-angle seismic profile along the Greenland-Iceland Ridge. This data represents the northernmost seismic transect of the SIGMA (Seismic Investigation of the Greenland Margin) project from 1996. We use forward ray tracing modelling to construct a two-dimensional velocity model from the observed travel times. Our results confirm the presence of anomalously (ca. 30 km) thick oceanic crust along the entire seismic transect. Decrease of lower crustal seismic velocities towards Iceland is consistent with crustal cooling away from the present day spreading centre. The seismic upper crust (oceanic layer 2) shows a relatively constant thickness of 5 km at the Greenland-Iceland Ridge, except for the central part of the seismic profile, where it thins to approximately 2 km. This observation may be indicative of a ridge jump, with the central part of the Greenland-Iceland Ridge representing an abandoned spreading centre which has experienced less supply of extrusive material than its surroundings.