



Nature of the seismic crust at the Aegir Ridge: A downward continuation approach

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The marine seismic data are influenced by variations in the thickness and velocity of the water column which causes fluctuations in the arrival times of seismic phases. Downward continuation of the ocean-bottom seismometer data are used to remove the contributions of the water column by bring the shot and receiver at a common datum such as the seafloor. Additionally, the downward continuation focus the seismic energy and hence improves the resolution.

We apply the downward continuation technique to analyze the OBS data collected along the eastern shoulder of the Aegir Ridge. The Aegir Ridge is an extinct spreading ridge in the North-East Atlantic ocean. Its proximity to the active Iceland hot-spot makes it important for understanding the process of hotspot-ridge interaction during the Oligocene. We present results of an OBS experiment, supported by single channel streamer, gravity and magnetic observations. Usable seismic data from 20 OBSs distributed along ~550 km length of the profile reveal the variations in crustal thickness and seismic velocities. Regional magnetic anomalies show a faster spreading rate towards the north and a slower spreading towards the southern end near the Iceland hotspot during the active period of the ridge. However, the observed and the predicted crustal thickness show an opposite trend. We interpret this anti-correlation between the seafloor spreading rate and the crustal thickness as a result of the interaction between the Iceland hotspot and the Aegir Ridge.