



Preliminary results from the August 2007 PETROBAR wide-angle seismic profile, Barents Sea

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We present results from an active-source, onshore-offshore seismic reflection/refraction transect acquired by the R/V *Håkon Mosby* as part of the PETROBAR project (Petroleum-related regional studies of the Barents Sea region). The 837 km-long profile is oriented NW-SE, coinciding with the deep multichannel seismic reflection profile IKU-B acquired in 1984. The transect comprises 4157 shots from a 78 l. (4800 cu.in.), 4-airgun source array. The shots were recorded by 28 GEOMAR ocean-bottom stations (26 4-component OBS and 2 single-component OBH) and 10 land stations deployed by the University of Copenhagen along the coast of northern Norway. Data quality is generally good, with clear signal at offsets of up to 120 km. We utilize first-arrival tomography and layer-based raytracing to model the velocity structure of the sediments, crust, and uppermost mantle in a complex tectonic regime. The profile images a wide range of crustal types and ages, including, from SE to NW: Proterozoic cratonic Baltica; Paleozoic orogenic Caledonides; generally westward-younging, Paleozoic to early Cenozoic basins; and transtensional rift structures and volcanics related to the Eocene breakup with Greenland. This is the first wide-angle seismic transect off northern Norway to extend continuously from oceanic crust, at the interpreted COB, to continental craton, near the Russian border. The deep MCS data combined with gravity modeling indicate significant heterogeneity of the crystalline crust along the profile, with thicknesses ranging from >35 km to <10 km, and associated basin sediment thicknesses of up to 20 km. The ongoing analysis and integration of the new wide-angle data will further constrain the crust and upper mantle structure

beneath the Barents shelf, with implications for the spatial and temporal evolution of the greater Barents Sea region, as well as the link between surface deformation and underlying geodynamic forces.