Geophysical Research Abstracts
Vol. 18, EGU2016-15552, 2016
EGU General Assembly 2016

Comparison of publically available Moho depth and crustal thickness grids with newly derived grids by 3D gravity inversion for the High Arctic region.

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We derived Moho depth and crustal thickness for the High Arctic region by 3D forward and inverse gravity modelling method in the spectral domain (Minakov et al. 2012) using lithosphere thermal gravity anomaly correction (Alvey et al., 2008); a vertical density variation for the sedimentary layer and lateral crustal variation density. Recently updated grids of bathymetry (Jakobsson et al., 2012), gravity anomaly (Gaina et al, 2011) and dynamic topography (Spasojevic & Gurnis, 2012) were used as input data for the algorithm. TeMAr sedimentary thickness grid (Petrov et al., 2013) was modified according to the most recently published seismic data, and was re-gridded and utilized as input data. Other input parameters for the algorithm were calibrated using seismic crustal scale profiles.

The results are numerically compared with publically available grids of the Moho depth and crustal thickness for the High Arctic region (CRUST 1 and GEMMA global grids; the deep Arctic Ocean grids by Glebovsky et al., 2013) and seismic crustal scale profiles. The global grids provide coarser resolution of 0.5-1.0 geographic degrees and not focused on the High Arctic region. Our grids better capture all main features of the region and show smaller error in relation to the seismic crustal profiles compare to CRUST 1 and GEMMA grids. Results of 3D gravity modelling by Glebovsky et al. (2013) with separated geostructures approach show also good fit with seismic profiles; however these grids cover the deep part of the Arctic Ocean only.

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