Combining altimetric/gravimetric and ocean model mean dynamic topography models in the GOCINA region

P. Knudsen, O.B. Andersen and A.L. Vest

Danish National Space Center, Copenhagen (Contact pk@spacecenter.dk)

A major goal of the EU project GOCINA (Geoid and Ocean Circulation In the North Atlantic) is to determine an accurate mean dynamic topography model in the region between Greenland and the UK. The improved determination of the mean circulation will advance the understanding of the role of the ocean mass and heat transport in climate change. To calculate the best possible synthetic mean dynamic topographies a new mean sea surface (KMS03) has been derived from nine years of altimetric data (1993-2001). The regional geoid has furthermore being updated using GRACE and gravimetric data from a recent airborne survey. New synthetic mean dynamic topography models have been computed from the best available geoid models and the mean sea surface model KMS03. Subsequently, an integrated approach has been used to compute MDTs from joint inversions of data from the various sources. These models will be compared with state of the art hydrodynamic mean dynamic topography models in the North Atlantic GOCINA area. The results show that great improvements were obtained with the improved geoid information from the GRACE satellite mission. Further improvements in the local characteristics of the ocean transport were obtained with the enhance geoid. Compared with the Composite MDT the synthetic MDT derived from the mean sea surface and this NAT04 geoid showed very similar results.