



OCTAS with a focus on the importance of a high precision mean sea surface

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A major goal of the OCTAS (Ocean Circulation and Transport between north Atlantic and the Arctic Sea) is to determine - in an integrated approach - the Mean Dynamic sea surface Topography (MDT) in the Fram Strait and adjacent seas.

This study provides detailed assessment and validation of the geoid, Mean Sea Surface (MSS), and MDT for the OCTAS study region. Synthetic MDTs were computed by the simple formula $MDT = MSS - \text{Geoid}$. For the validation of MSS and geoid models, the MDT based on ocean hydrographic data were compared with the synthetic MDT. Several MDT based on ocean hydrographic data were studied. The OCCAM and FOAM models provided best results. The synthetic MDT (OCTAS06_v3 MSS-OCTAS_02 geoid) showed similar major oceanographic features as the OCCAM MDT. A mean of approximately 9.5 cm for the differences between synthetic and OCCAM models was estimated. Further, the three models of geoid, MDT and MSS have been inter-compared and the residuals were determined by the simple formula $R = MSS - \text{Geoid} - MDT$. The residuals R for OCTAS06_v3 MSS, OCTAS_02 geoid and OCCAM MDT provides a standard deviation mismatch of 13 cm. Note that OCTAS_02 is not a MSS model but a gravimetric geoid computed in the OCTAS study region in 2004. Long-wavelength portion of this geoid model is determined from global geopotential model GGM01C up to degree and order 200. In this study, several MSS models have been studied and their respectively consistency and accuracy evaluated.