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The OCTAS06-North Atlantic/Arctic ocean mean sea surface model

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This paper describes the integrated approach for the determination and evaluation of the OCTAS (Ocean Circulation and Transport between north Atlantic and the Arctic Sea) Mean Sea Surface (MSS) model using multiple space borne, in situ and ocean general circulation model data.

Multiple high-latitude observing satellite radar altimetry data, including ENVISAT, ERS-2, ERS-1 ERM, ERS-1 GM and GFO data, are used to determine the OCTAS MSS. These data have been cross-validated and using the multiple altimetry data base (the so-called stack files) generated at the Ohio State University. ERS-2 mean tracks were used as a reference in two of the MSS models. The third model (OCTAS06_v3) is developed with the mean tracks of TOPEX/POSEIDON as a reference. In the third model, the annual, semi-annual as well as sea surface trends were removed. The resolution of all OCTAS06 models is 3 minutes in latitude and 6 minutes in longitudes. The OCTAS06_v3 mean sea surface from satellite altimetry ranges between 15 and 70 m. The internal consistency or the quality estimate for the MSS models ranges from 2 to 7 cm. This quality estimate is based on the residual from fitting the data to the model using least squares collocation. The OCTAS MSS models were also further validated using available global and regional models (KMS03, KMS04, CLS01, CLS04, GSFC00, and OSU95). Mean and standard deviation of differences between OCTAS06_v3 and KMS04 MSS models are 0.3 cm and 11.4 cm, respectively.