



GOCE++ Dynamical Coastal Topography and tide gauge unification using altimetry and GOCE

Ole Baltazar Andersen (1), Per Knudsen (1), Karina Nielsen (1), Christopher Hughes (2), Michael Kern (3), Mederic Gravelle (4), Luciana Fenoglio-Marc (5), rory Bingham (6), and guy Woppelmann (4)

(1) DTU Space, Geodesy, Lyngby, Denmark (oa@space.dtu.dk), (2) University of Liverpool, NOC, United Kingdom, (3) ESA ESTEC, Noordwijk, The Netherland, (4) University La Rochelle, France, (5) University of Bonn, Germany, (6) University of Bristol, United Kingdom

Within GOCE ++ the use of ocean levelling is taken as a novel approach to the study of height system unification across the oceans taking the recent development in geoid accuracy through GOCE data into account.

The suggested investigation involves the use of measurements and modelling to estimate Mean Dynamic Topography (MDT) of the ocean along a coastline, which contributes/requires reconciling altimetry, tide gauge and vertical land motion. Close to the coast the determination of the MDT is problematic due to i.e. the altimeter footprint, land motion or parameterization/modelling of coastal currents.

The objective of this activity is to perform a consolidated and improved understanding and modelling of coastal processes and physics responsible for sea level changes on various temporal/spatial scales. The study presents the following elements

Develop an approach to estimate a consistent DT at tide gauges, coastal areas, and open ocean; Validate the approach in well-surveyed areas where DT can be determined at tide gauges; Determine a consistent MDT using GOCE with consistent error covariance fields; improving altimetry (SAR) along the coast for MSS/MDT improvement and finally connecting the global set of tide gauges and investigate trends