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Estimating the mean dynamic sea topography by combining so-called complete gravity field models and altimetry

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The ocean's mean dynamic topography is used to improve estimates of the general ocean circulation. In principle the dynamic topography results from subtracting the geoid height from the altimetric mean sea surface. However, the data types have different representations and spatial resolutions. Therefore, it is necessary to develop processing strategies considering this aspect in estimating the ocean's mean dynamic topography. On this poster we want to present the following approach.
We consider the altimetric mean sea surface as a sum of geoid height represented in terms of spherical harmonics and the mean dynamic topography parameterized by a finite elements method. So-called complete gravity field models which span the entire space have recently been designed. The altimetry information and the complete gravity field model can now be combined in terms of normal equations resulting in an estimation of the ocean's mean dynamic topography with a regular covariance matrix, which can be integrated into stationary ocean models. We will demonstrate our approach presenting results obtained for the North Atlantic Ocean.