An updated EOT model: first impressions from the North Sea

Abstract:

The accuracy of ocean tide models has largely improved over the last decades as a result of enhanced modelling techniques and the use of satellite altimetry. In the latest comprehensive assessment on ocean tide models by Stammer et al. 2014, the DGFITUM’s altimetry-based model (the EOT11a, Savcenko and Bosch 2012) showed performances in line with the available coexistent global models. A new intermediate version (t) of the EOT model – namely the EOT18t - was recently implemented, and takes advantage of the latest progresses in altimetry. The method used to derive the single tidal constituents is a least-squares based harmonic analysis, performed on Sea Level Anomalies corrected for the FES2014 tide model. Fifteen tidal constituents are computed on a regular grid with resolution of 1/8°. For each grid node, altimetric observations are selected within a radius of 330 km, and weighted with a Gaussian function dependent on the distance to the node. The data used for this purpose are taken from NASA and ESA missions and cover a period of circa 25 years. In this work we present the first regional assessment of the EOT18t. The region chosen for this purpose is the North Sea, characterized by a large number of in-situ observations, which allow an
analysis of the model's open-ocean and coastal performances. A direct comparison with other tide models (such as FES2014, TPXO8, GOT4.8, DTU10, and the former EOT11a) will also be shown, in order to highlight the differences at the coast, where larger discrepancies are expected.