Abstract Details

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Title: (IWG3D) Spectrum Analysis of Mean Dynamic Ocean Topography from the GRACE GGM01 Geoid

Abstract:
During the last two decades satellite altimetry has offered an abundance of measurement of the sea surface resulting in the improvement of marine gravity field and geoid determination, so some high accuracy Mean Sea Surface (MSS) models are available (e.g. CLR, CLS01, KMS01). Moreover, the long-wavelength gravity model has been improved greatly in recent years. The data set collected by GRACE is global in coverage, homogeneous in distribution and of very high accuracy. For spatial scales as small as 200 km, the GRACE data used to develop the GGM01 model has improved our knowledge of the gravity model by an order of magnitude over that obtained using over 30 years of tracking to geodetic satellites such as those used in (e.g. EGM96). These breakthroughs signal a great opportunity for the use of geodetic altimetry-derived products in the estimation of other parameters related to the marine environment. One of these quantities is the mean dynamic ocean topography (DOT), which is of high importance not only for oceanographic studies but also for the geodetic ones. In this study, base on the new gravity model GGM01C derived from GRACE mission and MSS model KMS01 from multiple mission altimetry, we determined a new global high-precision and high-resolution DOT, and also analyzed the DOT obtained by GGM01C and EGM96 to different degrees/orders by spectral analysis. From the spectrum analysis, the DOT is mainly composed of long wavelengths and its power structure is stable, but its structure of power spectrum is different between zone and meridian. There are many differences in DOT between the two models, which explain why the geostrophic currents determined from the two models by B.D.Tapley show different shapes.

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