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Global mean dynamic topography based on GOCE data and Wiener filters

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A mean dynamic ocean topography (MDT) has been computed by using a GOCE-only gravity model and a given mean sea surface (MSS) obtained from satellite altimetry. Since the used gravity model, i.e. the fifth release of the time-wise solution covering the full mission lifetime, is truncated at a maximum harmonic degree of 280, the obtained MDT has to be consistently filtered. This has been done globally by using the spherical harmonic representation and following a Wiener minimization principle. This global filtering approach is convenient from the computational point of view but requires to have MDT values all over the Earth surface and therefore to fill the continents with fictitious data.
The main improvements with respect to the already presented results are in the MDT filling procedure (to guarantee that the global signal has the same covariance of the one over the oceans), in the error modelling of the input MSS and in the error estimation of the filtered MDT and of the corresponding geostrophic velocities.
The impact of GOCE data in the ocean circulation global modelling has been assessed by comparing the pattern of the obtained geostrophic currents with those computed by using EGM2008. Comparisons with independent circulation data based on drifters and other MDT models have been also performed with the aim of evaluating the accuracy of the obtained results.