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Poster
Usually 'geodetic' estimates of the Dynamic Ocean Topography (DOT) are performed with a long-term Mean Sea Surface (MSS), already implying a significant temporal smoothing. By the profile approach, developed at DGFI it has been demonstrated that DOT estimates can also be achieved if along-track sea surface heights are reduced by geoid heights, derived from the latest GOCE-based gravity field models. Both, the sea surface heights and the geoid heights are to be filtered in the same way in order to ensure spectral consistency of both quantities. We apply a Gauss-type filter (with no side lobes neither in the spatial nor in the spectral domain) with filter length of some 70 km, corresponding to a spherical harmonic series up to degree 210. This way we obtain instantaneous profiles of the dynamic ocean topography (iDOT-profiles) approaching meso-scale resolution. After a new, careful multi-mission cross-calibration (MMXO13) we have now re-computed these iDOT-profiles for all passes of Topex, Poseidon, Jason1/2, ERS1/2, Envisat, and GFO with GOCO03S (Mayer-Gürr et al. 2013), one of the latest gravity models, combining GRACE and GOCE data. First iDOT-profiles for CryoSat are also available. All together the iDOT-profiles of these altimeter satellites realize a multi-mission sampling of the DOT with rather dense spatial and temporal resolution. The geostrophic velocity field of gridded iDOT-profiles show much more details and significant stronger velocities than an MSS-based DOT. In addition, the iDOT-profiles realize (smoothed) snapshots of the DOT and allow to construct (for the period up to 1993) a two decade time series of the DOT and the associated geostrophic velocity field, which exhibit the temporal evolution of the DOT, in particular the Eddy formation in the strong western boundary currents.
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