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Assimilation of geodetic dynamic ocean topography with ensemble based Kalman filter

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We use the geodetic method to obtain the dynamical ocean topography (DOT). This method combines the multi-mission-altimeter sea surface height and the GRACE/GOCE gravity field. Using the new global filtering approach, the spectral consistency of both fields is achieved by filtering the sea surface height and the geoid. The new global filtering approach reduces the artificats near the coast lines.

Further, results of assimilation of multi-mission-altimeter data and the GRACE/GOCE gravity data into the finite element ocean model (FEOM) are investigated. By assimilating only absolute dynamical topography data using the ensemble Kalman filter and time varying observation error covariances, we were able to improve modeled fields. Results are closer to observations which were not used for assimilation and lie outside the area covered by altimetry in the Southern Ocean (e.g. temperature of surface drifters or deep temperatures in the Weddell Sea area.)