



Impact of assimilation of dynamic ocean topography from radar altimetry and GRACE/GOCE geoid on Weddell Gyre

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The assimilation of the absolute dynamical topography is a difficult task because ocean general circulation models commonly show systematic deviation from the measured mean dynamic ocean topography (DOT). We examine the impact of assimilating the DOT obtained by multi-mission altimeter data and the GRACE/GOCE gravity fields into the global finite element ocean model (FEOM), with the focus on the Southern Ocean circulation. The geodetic DOT is estimated every 10 days. Using profile approach filtering, it is ensured that the geoid and the altimetric spectral content of the data are compatible. The new GOCE gravity data allow for an increase in the spectral content of the geodetic DOT data. Therefore much finer scales in the vicinity of major currents are present in the DOT data. We use ensemble based Kalman filter algorithm together with localization technique and covariance function optimized to fit the spectral content of the data. The results are validated against a composite from ARGO floats deployed in the vicinity of the Weddell Gyre. The results for this area show improvements due to the increased resolution of the geodetic DOT data fields.