



## **Evaluation of the new Mercator global eddy-resolving (1/12) ocean model: Mean state, day-to-day variability and mesoscale activity.**

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In 2007, Mercator Ocean has developed for operational oceanography application a global ocean high-resolution model (1/12°), coupled with a sea ice model, based on the NEMO1.09 OGCM (OPA9 for the ocean part and LIM2 for the ice one). An inter annual experiment in forced mode (without assimilation), performed with this configuration and driven by atmospheric ECMWF analyses over the period 1999 to 2007, has already shown promising results in terms of major currents pathways and the levels of their eddy kinetic energy.

Last year, we have developed a new 1/12° configuration, based on NEMO3.2, including an updated bathymetry from ETOPO1, new parameterizations (light penetration depending on Chlorophyll climatology, tidal mixing in the Indonesian through flow, CORE bulk formulae for air/sea exchanges), and an upgrade of the sea ice model with the EVP rheology. A new experiment with all these changes has then been performed over the same period 1999-2007 and driven by the ERAinterim reanalysis. Also, in order to better capture high frequency variability, the atmospheric forcing is sampled to 3H conjointly with a diurnal cycle applied to the radiative atmospheric forcing. A new method of correction towards the satellite GEWEX dataset has been applied to reduce the warm bias present in the downwelling ERAinterim radiative fluxes.

After a comparison between the previous and the new experiment, a validation with available datasets (in situ temperature and salinity, altimetry, sea surface temperature and sea ice satellite measurements) is presented. Then, a particular focus is made on the variability and on the mesoscale activity (Okkubo-Weiss criteria) resolved by the new 1/12° configuration and these results are compared with the altimetric data.