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Multi-decadal re-analysis for the Mediterranean Sea: methods and quality assessment

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Two reanalyses from 1985 to 2005 have been produced for the Mediterranean sea circulation using different assimilation schemes: a Reduced Order Optimal Interpolation and a new 3DVAR scheme (Dobricic et al, 2007). The general circulation model used is the OPA 8.1 code implemented in the Mediterranean Sea (Tonani et al. 2007). The present model formulation uses a realistic water flux with river runoffs which augments the realism of the simulation.

The observational data set assimilated for both reanalysis is the historical data archive of MedATLAS (Maillard et al, 2003) and it contains vertical in situ profiles of temperature and salinity from bottles, XBT, MBT and CTD sensors and along track satellite sea level anomalies from ERS1, ERS2, Envisat, Topex/Poseidon, Jason1 satellites (Pujol et al., 2005), daily mean fields of Sea Surface Temperature from Medspiration (Marullo et al., 2007). The Mean Dynamic Topography of Dobricic (2005) has been used for both experiments.

The results of both reanalysis are comparable and they are qualitatively consistent to the known structures of the circulation in the period of interest. Detailed analysis of the quality of the analysis in terms of differences between independent observations and the analyses will be carried out. The major features of the Mediterranean Sea circulation for the past twenty years will be overviewed.