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Coupling OGCM and Wave model trough the drag coefficient

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Modelling air-sea interaction is a key issue in numerical model studies of the ocean. In this work we focus our attention in momentum flux exchange using a coupled OGCM-Wave model implemented in the Mediterranean Sea region.
The model chosen are NEMO and WAM for the primitive equation describing the ocean and the wave processes modelization respectively. The models are two ways coupled as the following: surface currents and SST computed by the ocean model are transferred to the wave model with 6 hour and1 hour frequency respectively; the wave model, solving the wave equations, computes the neutral drag coefficient and passes it to the ocean model with 1 hr frequency; as the last interaction NEMO, starting from the neutral drag coefficient, computes the turbulent component which takes into account also the stability of the air-sea interface. A set of twin experiment of two years of simulation starting from Jan 2009 have been performed changing the drag coefficient parameterization.
The scope of this work is to better understand the influence on the drag coefficient from the roughness of the sea state and from air-sea thermal stability.
Model results are evaluated using in situ and remote observation. The Ocean model simulations are compared with temperature and salinity profiles, current meter, drifting buoys, and satellite derived altimetry and SST estimates. WAM model results are compared with wave buoys observations for the most common wave fields: significant wave height, mean and peak period and wave direction.
Preliminary results show that the drag coefficient parameterization changes mesoscale circulation and the improvement of the coupling with respect to the stand alone model depend on the hydrodynamic and gravity wave regimes. WAM results seem to confirm that the wave current interaction gives benefit in simulating the wave spectrum.