

# THE NEMO HIGH RESOLUTION COASTAL MODEL FOR WIND INDUCED VORTICES PREDICTION FLUID DYNAMICS (ECCOMAS CFD 2010 Lisbon)

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## ABSTRACT

A high resolution coastal model has been developed for the North Western Mediterranean Sea [1] based on the of the NEMO-OPA 9.0 release (Nucleus for European Modelling of the Ocean) [www.nemo-ocean.eu/](http://www.nemo-ocean.eu/). This model deals with an horizontal resolution is 1.25 km (1/64°) and a 130 grid points Cartesian vertical discretization and is forced in initial and open sea boundary conditions by the MED16 (OPA 1/16°) coarse model and ERA 40 or REMO reanalysis of the ECMWF atmospheric model. The OPA model is involving a TKE turbulent closure and a TVD scheme for river plume front capture with an “eddy resolving” bilaplacian horizontal scheme. The model is used to investigate the effect of open sea boundary conditions and wind forcing resolution on the coastal patterns prediction including eddies, meanders, river plumes and internal waves. The realistic simulation of small to mesoscale patterns are shown to be especially sensitive to the open sea boundary conditions and wind curl and gusts as resolved by downscaling atmospheric forcing models. The model assessment is based on comparison with collocated observed HF radar measurements, satellite images and hull mounted current profile concerning the shelf edge Northern current and coastal eddies.

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### **-References**

[1] Langlais C., Barnier; B., Molines J-M, Fraunié P., Jacob D. and Kotlarski S., Evaluation of a dynamically downscaled atmospheric reanalysis in the prospect of forcing long term simulations of the ocean circulation in the Gulf of Lions. To appear in *Ocean Modelling*.