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Development of a relocatable ocean prediction system for Ligurian sea

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The prediction of pollutant dispersion is, usually, based on the coupling of a lagrangian model with an eulerian circulation model. The eulerian model provides velocity fields used to drive the lagrangian particle dispersion model. The particle diffusion strongly depends on the Eulerian velocity fields and the ocean forecast accuracy is important to predict correctly the spreading of pollutants in the sea. The Ocean General Circulation Model that provides eulerian field for the whole Mediterranean Sea is the MFS (Mediterranean Forecasting System). The model releases every day for ten-days mean daily field of temperature, salinity and velocity with 1/16° x 1/16° horizontal resolution (~ 6.5 km) and 72 unevenly spaced vertical levels. This horizontal resolution (6.5 km) could represent a limit for the lagrangian simulation and for accuracy the pollution prediction. Rapid implementation of relocatable model represents a solution to this problem. In the Ligurian Sea, a relocatable model, based on the Harvard Ocean Prediction System (HOPS), has been nested in the MFS circulation model. The HOPS model has been implemented with 3 km horizontal resolution and 40 vertical sigma layers. Initial and lateral boundary conditions are obtained from MFS. The atmospheric forcings are interactively computed using the European Centre for Medium Range Weather Forecast (ECMWF) operational products. Moreover the current fields computed by relocatable model are used to drive the lagrangian simulation. Model validation is realized with Satellite Sea Surface Temperature (SST) and observational CTDs expressively collected for model calibration and validation during the MREA07 experiment in May 2007. During the latter, drifters were released for validation of trajectories with and without downscaling by the relocatable model. Our

results and findings on ocean dynamics in the region and on multi-scale, multi-model system modeling will be presented.