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Downscaling CMEMS Mediterranean model over the Western basin: impacts on mean flows and mesoescale eddies

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The Mediterranean Sea is often considered as a small scale ocean laboratory where energetic eddies, fronts and circulation features have important ecological consequences. Downscaling the CMEMS Mediterranean model over a reduced area allows to reproduce the fine scale variability and coastal processes with a higher resolution, and the interactions between mean flows and mesoscale eddies in particular.

In this work, the impact of downscaling the CMEMS Mediterranean model over the Western basin is evaluated using the high resolution Western Mediterranean Operational model (WMOP, ∼2km spatial resolution) developed at SOCIB, the Balearic Islands Coastal Observing and Forecasting System. WMOP uses the larger scale CMEMS Med model (v02, ∼6km resolution) as initial and boundary conditions. Downscaling effects are assessed considering in particular 1) the mean surface spatial flows over three strategic areas monitored with High Frequency Radars (HFR), and 2) the spatial distribution, number, size and lifetime of mesoscale eddies. The model evaluations as well as the quantification of the impacts of downscaling are achieved through a multi-platform perspective which includes high-resolution surface currents observations from HFR, glider transports across a key-section, and satellite altimetry data.