

High resolution modelling in the North Western Mediterranean Sea: a few insights and challenges on coastal currents simulations.

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ABSTRACT

A NEMO very high resolution configuration nesting is set for the Var coast area (North-Western Mediterranean area). The parent grid is the GLAZUR64 configuration (at $1/64^\circ$) and the child is NIDOR192 (Nesting Ile D'OR at $1/192^\circ$). The GLAZUR64 domain is the North Western Mediterranean Sea (French coastline mostly) and its embedded configuration, NIDOR192, covers the Var coast line, a key area featuring islands, abrupt topography and bounded off-shore by the Northern Current (NC), the major current of the area. The nesting is operated with AGRIF in a 2-way mode.

The scientific challenges presented will first focus on the NEMO relevance to model processes at such high resolution with a standard parametrization. In particular, the high-resolution (HR) contribution to simulate the NC meso-scale features in the zoomed domain is evidenced. Then, the propagation of the HR dynamics generated by NIDOR192 is shown: it appears to be relatively significant just outside the zoom but quickly vanishes downstream, probably being too constrained by GLAZUR64 boundary conditions. Finally, comparisons are made between observations and modelled coastal currents in a relatively confined area, the Hyères Bay bounded by the “Iles d'Or” islands. While NIDOR192 simulates realistic coastal structures and NC intrusions in the bay that were not present in GLAZUR64, the modelled surface currents remain anyway significantly weaker than the average speed recorded by drifters deployed in the bay. On going work on this issue will be presented, focusing specifically on the spuriously smoothed vertical gradient of the horizontal velocity for the first ocean levels.

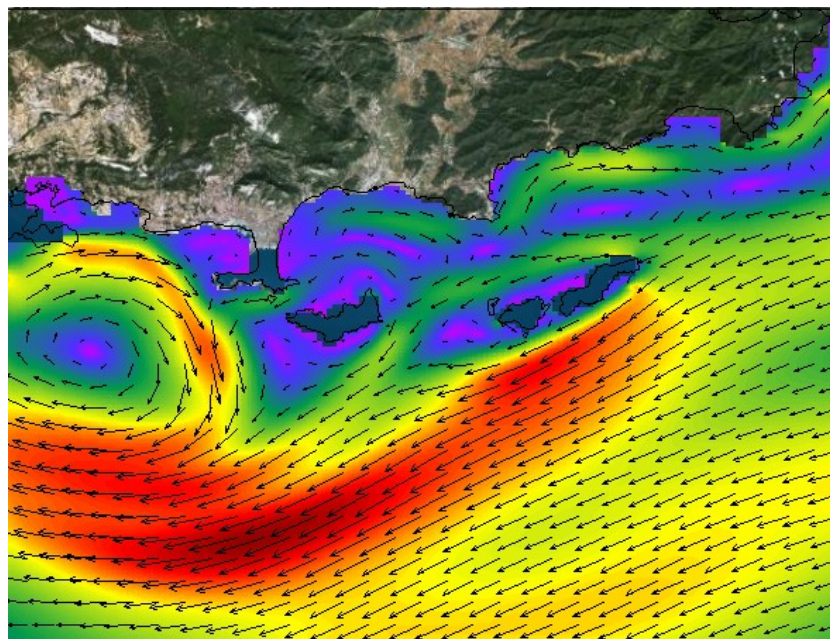


Figure: NIDOR192 modelled domain