



High-resolution real-time forecasting systems and services in support of fine-scale field experiments in the Western Mediterranean Sea

High-resolution real-time forecasting models were implemented to support three intensive field experiments aiming at targeting small mesoscale and submesoscale processes in two dynamic areas in the Western Mediterranean Sea (Alboran Sea in 2018 and 2019 and Balearic Sea in 2022). The field experiments were carried out in the framework of the Calypso Office of Naval Research Departmental Research Initiative, whose overall objective is to better understand three-dimensional pathways from the surface to the ocean interior. High-resolution data-assimilative systems and refined simulations (2km to 500m resolution) were developed at the Balearic Islands Coastal Observing and Forecasting System (SOCIB) and Massachusetts Institute of Technology (MIT-MSEAS). These systems provided daily predictions of ocean properties including small-scale density gradients, relative vorticity, horizontal convergence, or vertical velocities, as well as Lagrangian metrics such as finite-time Lyapunov exponents, path-integrated divergen

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