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A Kelvin wave event in the Gulf of Naples (Tyrrhenian Sea): observations and modeling

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Current-meter measurements performed in the Bocca Piccola (the strait separating the island of Capri from the Sorrento peninsula in the Gulf of Naples) yield a strong 5-day current oscillation in June 2003. A high-resolution sigma-coordinate model of the circulation of a Tyrrhenian Sea coastal area coupled with an operational circulation model of the whole Tyrrhenian Sea reproduces correctly the oscillation. Model outputs are used to interpret the phenomenon. The oscillation, arising from the relaxation of an extended coastal upwelling, is associated with coastal patterns that decrease exponentially from the coast with an e-folding length scale L and propagate with the coast to the right with phase speed c. Both L and c are found to be in excellent agreement with Kelvin wave theory. The subtle role played by the nesting in reproducing such a dynamical feature is finally discussed (this contribution is obtained in the framework of the Italian RITMARE Flagship Project, U.O. SP3-WP4-AZ1-UO03).