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Capturing remote mixing due to internal tides using multi-scale modeling tool: SOMAR-LES EDWARD SANTILLI, Philadelphia University, VAMSI CHALAMALLA, ALBERTO SCOTTI, Univ of NC - Chapel Hill, SUTANU SARKAR, University of California San Diego — Internal tides that are generated during the interaction of an oscillating barotropic tide with the bottom bathymetry dissipate only a fraction of their energy near the generation region. The rest is radiated away in the form of low- high-mode internal tides. These internal tides dissipate energy at remote locations when they interact with the upper ocean pycnocline, continental slope, and large scale eddies. Capturing the wide range of length and time scales involved during the life-cycle of internal tides is computationally very expensive. A recently developed multi-scale modeling tool called SOMAR-LES combines the adaptive grid refinement features of SOMAR with the turbulence modeling features of a Large Eddy Simulation (LES) to capture multi-scale processes at a reduced computational cost. Numerical simulations of internal tide generation at idealized bottom bathymetries are performed to demonstrate this multi-scale modeling technique. Although each of the remote mixing phenomena have been considered independently in previous studies, this work aims to capture remote mixing processes during the life cycle of an internal tide in more realistic settings, by allowing multi-level (coarse and fine) grids to co-exist and exchange information during the time stepping process.

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