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Employing an Internal Wavemaker to Simulate Sensory Cues in the Plankton A.C. TRUE, D.R. WEBSTER, M.J. WEISSBURG, J. YEN, Georgia Tech — Internal waves are a ubiquitous feature in many coastal marine ecosystems and as such are important features to consider in the spatiotemporal dynamics of thin planktonic layers. Oscillations of the pycnocline in stratified waters due to internal wave propagation generate fluxes of quantities, such as fluid momentum, thermal energy, and chemical concentration. These fields compose a set of hydrodynamic and thermochemical sensory cues that are fundamental to many planktonic life processes, including prey and predator detection, mate-tracking, habitat partitioning, nutrient and waste transport processes, and chemical communications. Thus, we expect that internal waves generate sensory cues in the water column, influence many fundamental biological processes, and broadly affect spatiotemporal productivity dynamics through unique biophysical coupling over a wide range of relevant scales. We constructed an internal wave generator facility to mimic characteristics that plankton observe *in situ*. Simultaneous particle image velocimetry (PIV) and laser-induced fluorescence (LIF) are employed on internal waves generated in a two-layer stratification to quantify wave-induced scalar fluxes. Difficulties inherent in scaling down in situ conditions for laboratory-scale behavioral assays are discussed in the context of accurately matching spatiotemporal scales from a planktonic point of view. Finally, the results are interpreted in the context of zooplankton sensory ecology.

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