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Copepod Trajectory Characteristics in Thin Layers of Toxic Algal Exudates D.R. WEBSTER, A.C. TRUE, M.J. WEISSBURG, J. YEN, Georgia Tech — Recently documented thin layers of toxic phytoplankton ("cryptic blooms") are modeled in a custom flume system for copepod behavioral assays. Planar laser-induced fluorescence (LIF) measurements quantify the spatiotemporal structure of the chemical layers ensuring a close match to *in situ* bloom conditions and allowing for quantification of threshold dissolved toxin levels that induce behavioral responses. Assays with the copepods *Acartia tonsa* (hop-sinker) and *Temora longicornis*(cruiser) in thin layers of toxic exudates from the common dinoflagellate *Karenia brevis* (cell equivalent $\sim$ 1 - 10,000 cells/mL) examine the effects of dissolved toxic compounds and copepod species on swimming trajectory characteristics. Computation of parameters such as swimming speed and the fractal dimension of the two-dimensional trajectory (F_{2D}) allows for statistical evaluation of copepod behavioral responses to dissolved toxic compounds associated with harmful algal blooms (HABs). Changes in copepod swimming behavior caused by toxic compounds can significantly influence predator, prey, and mate encounter rates by altering the fracticality ("diffuseness" or "volume-fillingness") of a copepod's trajectory. As trophic mediators linking primary producers and higher trophic levels, copepods can significantly influence HAB dynamics and modulate large scale ecological effects through their behavioral interactions with toxic blooms.

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