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Thin Layer Sensory Cues Affect Antarctic Krill Swimming Kinematics A.C. TRUE, D.R. WEBSTER, M.J. WEISSBURG, J. YEN, Georgia Tech

— A Bickley jet (laminar, planar free jet) is employed in a recirculating flume system to replicate thin shear and phytoplankton layers for krill behavioral assays. Planar laser-induced fluorescence (LIF) and particle image velocimetry (PIV) measurements quantify the spatiotemporal structure of the chemical and free shear layers, respectively, ensuring a close match to *in situ* hydrodynamic and biochemical conditions. Path kinematics from digitized trajectories of free-swimming *Euphausia superba* examine the effects of hydrodynamic sensory cues (deformation rate) and bloom level phytoplankton patches ($\sim$1000 cells/mL, *Tetraselamis spp.*) on krill behavior (body orientation, swimming modes and kinematics, path fracticality). Krill morphology is finely tuned for receiving and deciphering both hydrodynamic and chemical information that is vital for basic life processes such as schooling behaviors, predator/prey, and mate interactions. Changes in individual krill behavior in response to ecologically-relevant sensory cues have the potential to produce population-scale phenomena with significant ecological implications. Krill are a vital trophic link between primary producers (phytoplankton) and larger animals (seabirds, whales, fish, penguins, seals) as well as the subjects of a valuable commercial fishery in the Southern Ocean; thus quantifying krill behavioral responses to relevant sensory cues is an important step towards accurately modeling Antarctic ecosystems.

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