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Hydrodynamics of caridoid escape response in krill ANGELICA CONNOR, D. ADHIKARI, DEVESH RANJAN, D.R. WEBSTER, Georgia Tech — Krill are shrimp-like crustaceans and are a keystone species in many deep-water food webs. Due to their abundance and sensitivity to changes in the environment, there are many studies on krill ecology. But, there is limited quantitative analysis of the hydrodynamics of their locomotion and biomechanics. The length of Antarctic krill can range 2-6 cm, and these animals typically swim in a low to intermediate Reynolds number (*Re*) regime. The caridoid escape response, a maneuver unique to crustaceans, occurs when the animal performs a series of rapid abdominal flexions resulting in powerful backward strokes. For the first time, the propulsion behavior and flow disturbance of a caridoid escape response performed by an Antarctic krill (*Euphausia superba*) has been quantified. A high-speed tomographic Particle Image Velocimetry (tomo-PIV) system quantifies three-dimensional flow fields around a free swimming *E. superba* and its wake. The specimen is roughly 3 cm in length and by using this tail flipping mechanism, it is able to accelerate backwards increasing its speed by 2 orders of magnitude in an interval of 0.025 s to a maximum speed of 25 cm/s. The data from these flow fields are used to calculate the changes in the velocity and vorticity field shedding light on both the flow behavior in this *Re* regime and intricacies of the bio-locomotion of zooplankton.

D.R. Webster
Georgia Tech

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