

Abstract Submitted
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Experimental Investigation of 3-D flow fields around the mouth of the Dwarf Seahorse during attacks on planktonic prey BRAD GEMMELL, EDWARD BUSKEY, U. Texas at Austin, JIAN SHENG, U. Minnesota — Copepods are an important planktonic food source for fish species. High predation has led to the development of effective escape responses with short reaction times (less than 2 ms), maximum escape velocities of over 500 body lengths per second and shear sensitivity as low as 1.5s^{-1} . Using high speed digital holography (2 kfps), we measure 3-D distributions of velocity generated by a dwarf seahorse (*Hippocampus zosterae*) during attacks on its copepod prey, *Acartia tonsa*. It is found that successful attacks often produce smaller or even no detectable hydrodynamic disturbances around the strike zone, when compared to unsuccessful attempts. In this paper, we will provide quantitative characterization of this “low-flow” zone. Further, to elucidate the role of a possible geometrical advantage of the seahorse’s head in minimizing its bow wave, high-speed time resolved PIV measurements are conducted in a low-speed water tunnel. On-going analysis will provide insights and implications in understanding the dynamics of flows around the stagnation point at high Reynolds number flow. Sponsored by NSF.

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