

Abstract Submitted
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Flow acceleration structure of Aurelia aurita: implications on propulsion JIN-TAE KIM, MATTHEW PIPER, LEONARDO P CHAMORRO, University of Illinois at Urbana-Champaign — The jetting and paddling mechanisms used by Aurelia aurita jellyfish allows for one of the most efficient propulsion among other metazoans. Characterization of the induced flow acceleration is critical to uncover distinctive patterns. We found four acceleration structures using 3D measurements of body and flow dynamics in Lagrangian frame of reference. Two intense structures occur near the bell margin and are generated by paddling; the other two around the center of the jellyfish and half magnitude are a result of jetting. Their interaction leads to the maximum flow velocity in the middle of the relaxation, where relatively straight flow trajectories occur. The jellyfish achieves an efficient relaxation by generating flow deceleration with minor body deceleration.

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