

Abstract Submitted
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Investigating the relationship between planform and performance in bio-inspired aquatic propulsion¹ OLIVER J. BADAOU, DANIEL B. QUINN, PETER A. DEWEY, Princeton University, ALEXANDER J. SMITS, Princeton University and Monash University — Experiments are conducted to investigate the effects of caudal fin planform shape on the hydrodynamic performance of bio-inspired aquatic propulsors. To isolate the effect of planform shape the surface area of the fins is held constant while the planform shape is systematically varied to incorporate bio-inspired designs that are consistent with those observed in nature. The self-propelled swimming speed and power consumption of heaving flexible panels of varying planform are measured in a stationary water tank. Particle image velocimetry is also employed to better understand the connection between the wake structures produced by the oscillating fins and their performance characteristics. Results are compared and analyzed in an effort to identify specific shape features that lead to a performance benefit or detriment.

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