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Shrimp theorem: paddle swimming at low Reynolds number DAISUKE TAKAGI, University of Hawaii at Manoa — A large variety of aquatic organisms, such as small planktonic crustaceans, use multiple legs as paddles; however the resultant dynamics and efficiency of locomotion are not yet clear. I will present a simple model of swimming with multiple pairs of stiff legs. The legs are assumed to oscillate in a metachronal pattern in a model based on slender-body theory for Stokes flow. The model predicts locomotion in the direction of the metachronal wave, as frequently observed in nature. Unlike scallops undergoing reciprocal motion, shrimp can swim at low Reynolds number. This study offers a possible explanation why crustaceans thrive in aquatic environments, and could inspire a new generation of powerful biomimetic robots.

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