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**Bio-inspired robotic legs drive viscous recirculating flows**

DAISUKE TAKAGI, RINTARO HAYASHI, University of Hawaii at Manoa — Crustaceans actuate multiple legs in a well-coordinated sequence to generate suitable flow for feeding and swimming. Inspired by tiny crustacean larvae operating at low Reynolds number, we study a scaled-up model in which slender rods oscillate independently in a bath of glycerol. Experiments reveal qualitatively different flow patterns depending on the phase and orientation of actuated rods. The observations are analyzed in the framework of slender-body theory for Stokes flow. This study shows that simple oscillatory motion of multiple legs can produce complex recirculating flows, with potential applications for mixing and pumping.

Daisuke Takagi  
University of Hawaii at Manoa

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