

Abstract Submitted  
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**Undulatory swimming on a free surface**<sup>1</sup> RAMIRO GODOY-DIANA, SOPHIE RAMANANARIVO, OLIVIA GANN, BENJAMIN THIRIA, PMMH UMR7636 CNRS; ESPCI ParisTech; UPMC; U. Diderot Paris 7 — A wide variety of swimmers in nature use body undulations to generate a propulsive force, in part owing to the relative insensitivity of the principle of undulatory swimming to the value of the Reynolds number  $Re = UL/\nu$ , which measures the relative importance of viscous and inertial forces in the flow considered ( $U$  and  $L$  being the typical speed and length of the animal, and  $\nu$  the kinematic viscosity of the surrounding fluid). Here we study a flexible filament forced to oscillate by imposing a harmonic motion to one of its extremities (using magnetic interactions) and propelling itself at the surface of a water tank. This experiment serves as a canonical model for studying the interactions between an elastic structure undergoing complex deformations and the surrounding fluid.

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Ramiro Godoy-Diana  
PMMH UMR7636 CNRS; ESPCI ParisTech; UPMC; U. Diderot Paris 7

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