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28223-0001. *Wake Structure and Energy Efficiency in Idealized Fishlike Locomotion.*

The planar mechanical system comprising a free Joukowski foil interacting with a collection of point vortices in a perfect fluid admits a Hamiltonian structure. Augmenting this system with a mechanism whereby vorticity can be shed from the trailing edge of the foil in a momentum-conserving way, we realize an idealized model for fishlike swimming. We use this model to explore two related issues pertaining to energy-efficient locomotion: (1) the characterization of efficient gaits for an isolated swimmer in terms of wake geometry and (2) the passive or controlled harvesting of propulsive energy by such a swimmer from the wakes of nearby swimmers. (Received March 30, 2010)