MAR08-2007-005621

Abstract for an Invited Paper
for the MAR08 Meeting of
the American Physical Society

Optimizing Low Reynolds Number Locomotion

ANETTE HOSOI, MIT

In this talk I will discuss optimal stroke patterns for low Reynolds number linked swimmers. We begin by optimizing stroke patterns for Purcell's 3-link swimmer modeled as a jointed chain of three slender links moving in an inertialess flow. The swimmer is optimized for efficiency and speed and we are able to attain significant increases is efficiency over those previously suggested by authors who only consider geometric design rather than kinematic criteria. We then go on to investigate uniflagellate and biflagellate organisms and compare the optimized results to biological data from spermatozoa and chlamydomonas.