

Dynamics of Dual Dumbbell Swimmers Embedded in a Viscous Membrane

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In this work we are interested in the dynamics of a pair of dumbbell swimmers embedded in a viscous membrane, where the hydrodynamic flow is essentially two dimensional when the length scale of interest is under a certain range. The natural length of the linking spring in each dumbbell is periodically changing and generating reciprocal motion. As long as the changes of these springs have a phase shift from one another, both swimmers exhibit various kinds of motion, depending on their relative positions and orientations. We investigate the long-time dynamics of these swimmers and examine its implications for the relevant biological systems.