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The Motion of an Artificial Micro-Swimmer Near a Rigid Surface ERIC KEAVENY, MARTIN MAXEY, Brown University — The presence of a bounding surface can alter the swimming speed and direction of a nearby micro-organism. To understand the factors that contribute to such behavior, we conduct simulations of the recently realized artificial micro-swimmer (Dreyfus et. al., *Nature*, **437**, 862-865 (2005)) in the proximity of a rigid boundary. To capture the dynamics of the magnetically driven flagellum-like tail composed of chemically linked paramagnetic beads, we treat the tail as a series of spheres tied together by inextensible, bendable links. These spheres interact magnetically through mutual dipole interactions, and hydrodynamic interactions are achieved by the force-coupling method. Depending on the applied field and the flexibility of the tail, a 20% increase in the swimming speed can be achieved as the swimmer approaches contact with the surface. Additionally, in the case of spiral actuation, the swimmer exhibits a lateral drift (rolling motion).

Martin Maxey
Brown University

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