

Abstract Submitted
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Directed swimming of nanoscale swimmers in an array of posts with non-circular section: modelling and shape optimization¹ JIAJUN TONG, MICHAEL SHELLEY, New York University — It has been shown experimentally that swimming of nanoscale rod-like bi-metallic swimmers can be biased and guided by an array of teardrop shaped posts in the solution, giving rise to a statistically directed motion in long time. This could be useful in many applications like concentrating nanoswimmers, or separating them from non-motile particles. We pose a model to study such directed swimming, taking into account the absorption and desorption of the swimmers to the vertical walls of posts. We emphasize the role of varying curvature along the circumference of a single post on the absorption and desorption. In seeking to enhance directed swimming, we apply shape optimization to find how we can design, based on experimental data, better posts which have higher efficiency of transporting swimmers.

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