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**Simulations of artificial swimmers in confined flows**[1] LUCA BRANDT, LAILAI ZHU, EERIK GJØLBERG, KTH Mechanics, Royal Institute of technology — Miniature swimmming robots are potentially powerful for microobject manipulation, such as flow control in lab-on-a-chip, localized drug delivery and screening for diseases. Magnetically driven artificial bacterial flagella (ABF) performing helical motion is advantegous due to high swimming speed and accurate control. Using boundary element method, we numerically investigate the propulsion of ABF in free space and near solid boundaries. Step-out at high actuation frequencies, wobbling and near-wall drifting are documented, in qualitative agreement with recent experiments. We aim to explore the effect of swimmer shape on the performance, thus benefiting design of efficient microswimmers. Propulsion of ABF confined by a solid wall with and without background shear flow is also studied, with a focus on wall-induced hydrodynamic interaction and its influence on the stability of the motion.

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