

Abstract Submitted
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Position and Trajectories of helical microswimmers inside circular channels HAKAN CALDAG, SERHAT YESILYURT, Sabanci University — This work reports the position and orientation of helical mm-sized microswimmers in circular channels obtained by image processing of recorded images. Microswimmers are biologically inspired structures with huge potential for medical practices such as delivery of potent drugs into tissues. In order to understand the hydrodynamic effects of confinement on the velocity and stability of trajectories of swimmers, we developed helical microswimmers with a magnetic head and a rigid helical tail, similar to those of *E. coli* bacteria. The experiments are recorded using a digital camera, which is placed above the experimental setup that consists of three Helmholtz pairs, generating a rotating magnetic field. A channel containing the microswimmer is placed along the axis of the innermost coil. Image processing tools based on contrast-enhancement are used to obtain the centroid of the head of the swimmer and orientation of the whole swimmer in the channel. Swimmers that move in the direction of the head, i.e. pushed kinematically by the tail, has helical trajectories, which are more unstable in the presence of Poiseuille flow inside the channel; and the swimmers that are pulled by the tail, have trajectories that stabilize at the centerline of the channel.

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