Abstract Submitted
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Slender soft-magnetic body in highly viscous flows[1] JAMES MARTINDALE, ROBERTO CAMASSA, RICHARD MCLAUGHLIN, LEANDRA VICCI, LONGHUA ZHAO, The University of North Carolina at Chapel Hill, NSF RTG FLUIDS GROUP TEAM — For a tilted soft-magnetic slender body in a highly viscous fluid whose motion is driven by a prescribed background rotating magnetic field, the interaction between hydrodynamic and magnetic forces must be understood in order to predict the combined motion of a rod in silicon oil. Such a system arises in an experiment emulating primary cilia-driven fluid flows in developing embryos. Using classical slender body theory, the magnetic contribution to this dynamical system results in a system of equations for the torque balance. Further, analysis of body geometry such as fixed curvature will be explored, and their influence on the fluid motion illustrated.

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