

Abstract Submitted
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Effect of confinements: Bending in Paramecium AJA EDDINS, Engineering Science and Mechanics - Virginia Tech, SUNG YANG, Department of Nano-bio Materials and Electronics, GIST, Republic of Korea, CORRIE SPOON, SUNGHWAN JUNG, Engineering Science and Mechanics - Virginia Tech — Paramecium is a unicellular eukaryote which by coordinated beating of cilia, generates metachronal waves which causes it to execute a helical trajectory. We investigate the swimming parameters of the organism in rectangular PDMS channels and try to quantify its behavior. Surprisingly a swimming Paramecium in certain width of channels executes a bend of its flexible body (and changes its direction of swimming) by generating forces using the cilia. Considering a simple model of beam constrained between two walls, we predict the bent shapes of the organism and the forces it exerts on the walls. Finally we try to explain how bending (by sensing) can occur in channels by conducting experiments in thin film of fluid and drawing analogy to swimming behavior observed in different cases.

Aja Eddins
Engineering Science and Mechanics - Virginia Tech

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