

Abstract Submitted
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Particle manipulation using vibrating cilia PHANINDRA TALLAPRAGADA, SCOTT KELLY, University of North Carolina, Charlotte — The ability to manipulate small particles suspended in fluids has many practical applications, ranging from the mechanical testing of macromolecules like DNA to the controlled abrasion of brittle surfaces for precision polishing. A natural method is non-contact manipulation of particles through boundary excitations. Particle-manipulation via a vibrating cilia to establish controlled fluid flows with desired patterns of transport is one such bioinspired method. We show experimental results on the clustering and transport of finite-sized particles in the streaming flow set up by the oscillating cilia. We further show computations to explain the effects of hyperbolic structures in the four dimensional phase space of the dynamics of finite-sized particles.

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