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Manipulation of suspended microparticles by steady streaming KWITAE CHONG, JEFF D. ELDREDGE, University of California, Los Angeles — It is well known that a body oscillating in a viscous fluid will generate steady streaming cells, a weak secondary flow created by non-linear interactions of the primary oscillatory flow. In this work, we explore the manner in which this steady streaming can transport microscale inertial particles. We use high-fidelity numerical simulations solving Navier-Stokes equation to simulate the steady streaming generated by a cylindrical probe undergoing translational oscillations perpendicular to its axis in a viscous fluid. It is observed that inertial particles are attracted toward small-amplitude limit cycles in one of the four after traveling a spiral trajectory. We especially focus on the influence of physical parameters such as inertial particle's size and density and probe oscillation frequency and amplitude on the streaming structures and attracting speed of the inertial particle. We also study the behaviors of particle motion in the vicinity of multiple probes, particularly when the oscillation parameters of the probes are asymmetric.

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