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3D Hydrodynamic Positioning using Micro-Steady Streaming Eddies JIAN CHEN, University of Washington, BARRY LUTZ, University of Washington, DANIEL SCHWARTZ, University of Washington — The eddy structure of low-intensity micro-steady streaming flows is useful for positioning particles and motile cells in predictable 3D locations that are dictated by the particle size, device design, and characteristics of the primary oscillating flow field. The flow field structure responsible for this positioning is characterized using tracer imaging methods and numerical simulations. Fluid-particle interactions are studied with a combined perturbation analysis and finite element method to understand the physics of microeddy-based hydrodynamic positioning and the implications for microfluidic device designs.

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