

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Probing particle transport in closed-streamline flows with microfluidic devices SHAHAB SHOJAEI-ZADEH, Rutgers University, JEFFREY MORRIS, The City College of New York — We use microfluidic devices to study the flow of neutrally-buoyant suspension around bluff-bodies. We use low-viscosity liquids and monodisperse particles of diameter below $10\ \mu\text{m}$ at a constant concentration of 8.4 volume %. Several bluff-body geometries are introduced and by using high-speed video imaging we observe a striking segregation of the particles and fluid in the wake region at elevated Reynolds numbers. Based on 2-D and 3-D flow field simulations, we interpret the migration of particles and their trajectories across the streamlines based on the geometry of the bluff-body. Experimental observations reveal that if particles are forced into an initially particle-depleted region, they will eventually leave and will bring the system to its original state.

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Date submitted: 05 Aug 2010

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