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Inertia- and deformation drive soft particle migration in finite Reynolds number flow YENG-LONG CHEN, Institute of Physics, Academia Sinica — Cross-stream migration of soft, deformable particles under simple shear and Poiseuille flow in a microchannel is investigated by hybrid Langevin dynamics - lattice Boltzmann method. At low shear rate, inertia- driven migration due to interfacial frictional stress and deformation-driven migration due to elastic point-dipole are determined. The migration velocity is found to agree with the predictions of Leal et al. (1974, 1979). At moderate shear rates, the migratory velocity is sub-linearly dependent on the particle Reynolds number (Re) and the Weissenberg number (Wi). The non-linear coupling between particle inertia and deformation leads to a migration-free zone in the channel center and no fixed steady state position.

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