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Hydrodynamic interactions of two particles in confined linear shear flow YIGUANG YAN, JEFFREY F. MORRIS, JOEL KOPLIK, City College of New York — The interactions between two solid bodies in a confined shear flow at finite Reynolds number are studied using lattice-Boltzmann numerical solutions of the Navier-Stokes equations. For generic initial conditions two classes of trajectory are found, in which the bodies either repel or bypass each other, depending on their starting spanwise separation and the shear rate. If the particles are initially well separated, a nearly fixed state on the centerline is observed up to a certain Reynolds number, beyond which the centerline is unstable and the shear flow carries the particles apart. Moreover, we find that the motion of one particle relative to a fixed one is qualitatively similar to that of two mobile particles, and that particles move independently when separated by at least several channel widths.

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