

Abstract Submitted
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Migration and fractionation of dense soft spheres in flow¹ YENG-LONG CHEN, Institute of Physics, Academia Sinica, CHIA-WEI HSU, Wesleyan University — We investigate suspensions of elastic particles in flow. Hybrid lattice Boltzmann-Brownian Dynamics (LB-BD) approach is used to capture coupling between particle deformation and changes to the fluid field. One particle and two-particle hydrodynamic interactions are characterized and compared with experimental measurements and theoretical calculations. We further investigate the influences of particle elasticity, concentration, and shape on the average flow velocity in dense suspensions of up to 30% particle volume fraction. It is found that the average flow velocity increases as the particle become more elastic due to wall-induced hydrodynamic migration. For binary mixtures, a novel mechanism to optimize particle fractionation based on particle elasticity is found.

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