

Abstract Submitted
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Shape Recovery of Elastic Red Blood Cells from Shear Flow Induced Deformation in Three Dimensions¹ YAN PENG, JOHN GOUNLEY, Old Dominion University — Red blood cells undergo substantial shape changes in vivo. Modeled as an elastic capsule, the shape recovery of a three dimensional biconcave capsule from shear flow is studied for different preferred elastic and bending configuration. The fluid-structure interaction is modeled using the multiple-relaxation time lattice Boltzmann (LBM) and immersed boundary (IBM) methods. Based on the studies of the limited shape memory observed in three dimensions, the shape recovery is caused by the preferred elastic configuration, at least when paired with a constant spontaneous curvature. For these capsules, the incompleteness of the shape recovery observed precludes any conjecture about whether a single or multiple phase(s) are necessary to describe the recovery process. Longer simulations and a more stable methodology will be necessary.

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