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Simulations of drop transport through obstacle arrays RUI ZHANG, JOEL KOPLIK, City College of CUNY, KOPLIK TEAM — Motivated by possible applications to the separation of deformable cells or drops, we use molecular dynamics simulations to investigate the transport properties of liquid drops in a periodic lattice of cylindrical posts at capillary numbers O(1) and Reynolds numbers O(10), and compare the results to previous studies for rigid or weakly deformable particles. A drop impacting a single obstacle is observed to deform, deflect, split and/or recombine, depending on the incident velocity and impact parameter, as well as the degree of mixing with the carrier fluid. We characterize the collision outcome and trajectory deflection as a function of these parameters. The calculations are extended to a periodic array of cylindrical obstacles, where we focus on the survival probability, drop size distribution and trajectory deflection. The results are compared to the directional locking effect observed for rigid particles in obstacle arrays.

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