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Molecular Dynamics simulations of polymers in Brownian ratchets. MARTIN KENWARD, GARY W. SLATER, University of Ottawa — Brownian ratchets rely on a combination of thermal *noise* and an asymmetry in a system to induce directed transport of particles (e.g., pumping in ion channels). This is somewhat counter intuitive since thermal motion is often a detriment to transport mechanisms. In particular a Brownian ratchet can be used to manipulate polymers, for example in separation systems. We present a Molecular Dynamics study (with explicit hydrodynamic interactions) of short polymer chains in a fluid subjected to a periodic, asymmetric, saw-tooth potential (with zero net force) which is switched on and off for given time intervals, τ_{on} and τ_{off} repectively. We examine how variations of τ_{on} and τ_{off} affect the net migration of the polymer chains. We also examine how the width of the trapping potential and the degree of asymmetry affects the dynamics of the molecules.

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