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Polymer Translocation through a Nanopore in the Presence of a Viscosity Gradient[1] HENDRICK W. DE HAAN, GARY W. SLATER, University of Ottawa — Of interest for both biological and technological applications, the translocation of a polymer across a membrane through a nanopore has been studied via simulations under a great variety of conditions. In this work, results will be presented from Langevin Dynamics (LD) simulations of polymer translocation where the viscosity on the *cis* side of the membrane is different from the viscosity on the *trans* side - a scenario both applicable to biological instances of translocation and replicable with artificial nanopores. Starting with the polymer halfway through the pore, the establishment of a preferential direction for large viscosity differences is observed. To investigate the origin of this effect, a simple model of the system as a 1D biased random walker in a viscosity gradient is explored by Monte Carlo and LD simulations. Good agreement between the simple model and the full polymer simulations for both the preferential direction and mean first passage time indicate that the effects that a viscosity difference across the membrane may have on translocation arise in the general case of a particle at a viscosity interface.

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