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Control of Polymer Translocation with External Forcing SANTTU OLLILA, Helsinki University of Technology, Finland, KAIFU LUO, TAPIO ALA-NISSILA, Helsinki University of Technology, SEE-CHEN YING, Brown University
— We investigate the dynamics of driven polymer translocation through a nanopore using two-dimensional Langevin dynamics simulations within the bead-spring model. A pulling force F is exerted on the first monomer whilst there is an opposing force F_E in the pore. For this setup, we calculate the distribution of translocation time τ, which is defined as the time for the polymer to traverse from one side of the membrane to the other, and the waiting time t_W, which is defined as the time between the translocations of the ith and the $(i+1)$th bead. As our main result, we characterize the fluctuations and the positions of the beads along the direction of F with respect to the position of the segments in the nanopore, and with respect to the position of the pore. Implications of these results to actual sequencing experiments are discussed.

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