

Abstract Submitted
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Assisted DNA hairpin retraction from nanopores MENI WANUNU, Department of Biomedical Engineering, Boston University, Boston, MA 02215, BUDDHAPRIYA CHAKRABARTI, Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138, JEROME MATHE, Department of Polymeric Materials and Interfaces, Evry University, Evry, France, 91025, DAVID R. NELSON, Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138, AMIT MELLER, Department of Biomedical Engineering, Boston University, Boston, MA 02215 — We present results from recent experimental and theoretical investigations of DNA hairpin retraction from an α -hemolysin nanopore in the presence of an assisting voltage. By mapping the translocation process to that of biased diffusion of a Brownian particle we compute the probability of the polymer to stay in the pore as a function of time. Using this model we back out the diffusion constant and the drift velocity of the polymer as a function of the assisting voltage. While the drift-diffusion model gives good agreement with experiments at low voltages it fails for high assisting voltages. We discuss possible reasons for this along with the implications of our work.

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