Abstract Submitted
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The Statistics of DNA Capture by Solid-State Nanopore[1] MIRNA MIHOVILOVIC, NICK HAGERTY, DEREK STEIN, Physics Department, BROWN UNIVERSITY TEAM — We have investigated the statistics of DNA threading through solid-state nanopores that are approximately 10 nm in diameter. Intense electric fields are generated in the vicinity of the pore when a voltage is applied across it in ionic solution. The electric forces experienced by a negatively charged DNA molecule are sufficient to pull it through in a folded, "hairpin" configuration. The ionic current blockade signal that results offers information about where along the 16.5 micrometer-long DNA molecule the fold was induced. We have analyzed the results of translocation experiments to build a probability distribution for the DNA capture location. We propose a simple polymer scaling theory to explain the results. Our model is based on the equilibrium distribution of polymer conformations in solution, and it predicts the observed bias for capturing molecules near the ends.

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