Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Langevin dynamics simulations of dsDNA translocation through synthetic nanopores CHRISTOPHER FORREY, MURUGAPPAN MUTHUKUMAR, University of Massachusetts, Amherst — We have modeled dsDNA using a coarse-grained bead-spring method to study its behavior as it is driven by a potential gradient through a nanoscopic pore located in a rigid membrane. Using the Poisson-Nernst-Plank formalism, we calculate traces of the ionic current corresponding to the translocation process and compare our findings with experimental results. In agreement with recent experiments, we find that the dsDNA frequently translocates in a folded configuration. We explore the role of chain length, potential difference and pore diameter on the frequency of translocation events, average residence time, electrophoretic mobility and percentage of unfolded events.

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Date submitted: 04 Dec 2005 Electronic form version 1.4