Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Out of Equilibrium Characteristics of a Forced Translocating Chain through a Nanopore[1] KURT BINDER, Johannes Gutenberg University, ANIKET BHATTACHARYA, University of Central Florida — Polymer translocation through a nano-pore in a thin membrane is studied using Langevin dynamics simulation with a particular emphasis to explore out of equilibrium characteristics of the translocating chain. We analyze the chain conformations both at the *cis* and the *trans* side separately. A detail picture of translocation emerges by monitoring the center of mass of the translocating chain, longitudinal and transverse components of the gyration radii and the end-to-end vector. We observe that polymer configurations at the *cis* side are distinctly different from those at the *trans* side. During the translocation, and immediately afterwards, different parts of the chain are characterized by a series of effective Flory exponents. We further notice that immediately after the translocation the last set of beads that have just translocated take a relatively compact structure compared to the first set of beads that translocated earlier and the translocation dynamics can be described as a propagating defect. We discuss implications of these results to the theoretical estimates and numerical simulation studies of the translocation exponent reported by various groups.

[1]Supported by Deutsche Forschungsgemeinschaft, SFB 625/A3 and from the Schwerpunkt für REchnergestützte Forschung in den Naturwissenschaften (SRFN).

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Date submitted: 28 Nov 2009 Electronic form version 1.4