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Sequence effects on the translocation of heteropolymers through a small channel[1] MICHEL G. GAUTHIER, GARY W. SLATER, University of Ottawa — Using a recently developed Monte Carlo algorithm and an exact numerical method, we calculate the translocation probability and the average translocation time for charged heterogeneous polymers driven through a nanopore by an external electric field. The heteropolymer chains are composed of two types of monomers (A and B) which differ only in terms of their electric charge. We present an exhaustive study of chains composed of 8 monomers by calculating the average translocation time associated with the 256 possible arrangements for various ratios of the monomer charges (λ_A/λ_B) and electric field intensities, E. We find that each sequence leads to a unique value of the translocation probability and time. We also show that the distribution of translocation times is strongly dependent on the three parameters λ_A, λ_B and E. Finally, we present results that highlight the effect of having repetitive patterns by studying the translocation times of various block copolymer structures for a very long chain composed of $N = 2^{18}$ monomers (with the same number of A and B monomers).

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