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Ionosphere perturbation of single DNA molecules in a.c. electric fields ZUBAIR AZAD, ROBERT RIEHN, North Carolina State University — The collapse of DNA molecules under an a.c. electric field was recently established, but is little understood. We applied alternating electric fields (0 - 200 kV/cm) to fluorescently labeled λ-DNA confined in quasi 1-d nanochannels. DNA was dissolved in a buffer that contained anionic tracer dyes of varying mobilities. Under a.c. electric fields we obseved a depletion of the anionic fluorophores in the region occupied by the DNA, and enrichment in the regions directly flanking it. The critical field strength to induce expulsion of the fluorophores was above 60 kV/cm. We believe that double-sided isotachophoresis can model the ion distributions in our experiment. Furthermore, we will comment on the dynamics of fluorescent co-ions in the solution perturbed by the DNA by observing their dynamics.

Robert Riehn
North Carolina State University

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