Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Knotted DNA in Nanofluidic Confinement ALEXANDER KLOTZ, PATRICK DOYLE, MIT — The behavior of topologically simple semiflexible polymers such as DNA has become well-understood in the last several years. Recently, several computational analyses have predicted that certain topological features of a polymer, such as the average size of pseudo-knots and the probability of knot formation, are enhanced by confinement. Here, we extend recent work on the stretching of knotted DNA and examine diffusion, relaxation, and chain statistics of topologically complex linear DNA molecules. Topological phenomena are studied both in the bulk and under nanofluidic confinement to examine the interplay between knotting and confinement in semiflexible polymers, as well as to provide a controlled experimental interrogation of the knotted region of the polymer.

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Date submitted: 06 Nov 2015 Electronic form version 1.4