

Abstract Submitted
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Non-classical diffusion of PDMS confined in a surface forces apparatus SUBHALAKSHMI KUMAR, CHANGQIAN YU, University of Illinois, Urbana-Champaign, SUNG CHUL BAE, STEVE GRANICK, University of Illinois, Urbana Champaign — We present FRAP measurements inside a surface forces apparatus. Polydimethylsiloxane (PDMS), well above its glass transition, was confined into molecularly-thin films between atomically smooth mica sheets. Translational diffusion was measured using fluorescence recovery after photobleaching (FRAP) as the polymer film thickness was changed from tens of R_g to $3 R_g$. The FRAP recovery curves of confined films are distinctly non-classical. Huge heterogeneity is suggested by stretched exponential behavior in which the power of time varies smoothly from $\beta=1$ (thick films) to $\beta=0.3$ (confined films) with a sharp transition between these limits.

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