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Surface Diffusion of Single Polymer Chain Using Molecular Dynamics Simulation TAPAN DESAI, PAWEL KEBLINSKI, SANAT KUMAR, Rensselaer Polytechnic Institute, STEVE GRANICK, University of Illinois — Results of recent experiments on polymer chains adsorbed from dilute solution at solid-liquid interface show the power scaling law dependence of the chain diffusivity, D, as a function of the degree of polymerization, N, $D \sim N^{-1.5}$. By contrast, for DNA molecules bound to fluid cationic lipid bilayers $D \sim N^{-1}$. We use molecular dynamics simulations to gain an understanding of these scaling behaviors. Our model systems contain chains comprised of N monomers connected by springs, embedded into athermal solvent confined between two solids plates. We will discuss the nature of dynamic adsorption transition and effects of hydrodynamics forces on chain diffusion and scaling exponent.

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