Understanding the Diffusion of Polymers Confined Between Interfaces

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The dynamic behavior of polymers near interfaces is critical to performance in several applications such as polymer nano-composites, tertiary oil recovery and fabrication of microelectronics. While many studies focus on diffusion perpendicular to a substrate, little is known about diffusion parallel to substrates which we aim to study here. Using covalently labeled fluorescent polymers and fluorescence recovery after photobleaching, we developed a new visualization approach to be able to directly measure the diffusion of polymers parallel to substrates and interfaces in films as thin as 30 nm.