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Effects of aging on glass-forming polymers AMIT SHAVIT, ROBERT RIGGLEMAN, University of Pennsylvania — Despite nearly twenty years of active research, the effects of nanoscale confinement on the properties of glass forming polymers remain poorly understood. Furthermore, molecular simulations have so far only played a limited role in our understanding of these confinement effects, which are important for applications in both membrane separation and semiconductor manufacturing. We have used molecular dynamics simulations to investigate the effects of aging on bulk and free-standing thin-film glass-forming polymers. We demonstrate that in the vicinity of the bulk glass transition temperature, there are regimes where the free surface is in equilibrium while the center of the film exhibits bulk-like aging. We compare our results with those published from recent experiments, and we provide a microscopic picture on the differences in physical aging in bulk and free-standing polymer films.

Amit Shavit
University of Pennsylvania

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