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Surface Dynamics of Partially Tethered Layers JIN KUK LEE, Dept. of Polymer Science, The University of Akron, BULENT AKGUN, SUSHIL SATIJA, NIST Center for Neutron Research, ZHANG JIANG, SURESH NARAYANAN, X-ray Science Division, Argonne National Laboratory, MARK FOSTER, Dept. of Polymer Science, The University of Akron — Thermally stimulated fluctuations on a polymer melt surface are important for adhesion, wetting, and tribology. We have found [1] that the characteristic time scale of these surface dynamics can be slowed by orders of magnitude by densely tethering the polymer chains to the underlying substrate. Thus, we are interested in understanding how the surface dynamics can be engineered by tailoring the degree of tethering of the chains. To achieve "partially tethered" polymer layers, sparsely grafted layers have been swollen with untethered chains and the surface dynamics studied as a function of the tethering details using X-ray Photon Correlation Spectroscopy. How the tethered chains are distributed through the layer has been determined using neutron reflectivity. Both grafting density and thermodynamic interaction between the tethered and untethered chains play roles in determining the surface dynamics.

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