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Surface Dynamics of Branched Polystyrene films SHIH-FAN WANG, JAE SIK LEE, SEWOO YANG, RODERIC P. QUIRK, MARK D. FOSTER, Dept. of Polymer Science, Univerisity of Akron, ZHANG JIANG, SURESH NARAYANAN, X-ray Science Division, Argonne National Lab, DAVID WU, Colorado School of Mines — Thermally stimulated fluctuations of a polymer surface have been studied for films containing branched polymers for the first time. The surface fluctuations were probed using x-ray photon correlation spectroscopy (XPCS), a recently-developed technique already applied to study the surfaces of melts of linear polystyrene chains. A continuum hydrodynamic theory of thermally stimulated capillary waves with a nonslip boundary condition is adequate to fit plots of relaxation time as a function of scattering vector. Changes in Tg with molecular architecture certainly play a role. However, comparison of data from a star made without the usual butadiene (BD) linking units with data from a star with 1-2 BD units per arm shows that the BD end capping of the arms affects the dynamics profoundly. This effect may not be described adequately by simply accounting for the reduction in Tg caused by the presence of the BD units. Acknowledgements: NSF support (CBET 0730692)

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