Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Effect of Long-chain Branching on Surface Dynamics of Polymer Films MARK D. FOSTER, SHIH-FAN WANG, JAE SIK LEE, SEWOO YANG, Dept. of Polymer Science, The University of Akron, ZHANG JIANG, SURESH NARAYANAN, X-ray Science Division, Argonne National Lab, DAVID WU, Colorado School of Mines — Thermally stimulated fluctuations of the surface of films of branched polystyrene chains have been studied using x-ray photon correlation spectroscopy (XPCS), a recently-developed technique that has already been applied to study the surfaces of melts of linear polystyrene chains. Surface relaxations of films of branched chains are faster than are those of films of linear analogs. However, the Tg's of the branched molecules are also lower. The variation in surface relaxation time as a function of scattering vector can be described well by a continuum hydrodynamic theory of thermally stimulated capillary waves with a nonslip boundary condition. However, the film viscosities inferred from fits of the theory to the data differ markedly from viscosities from bulk measurements. Acknowledgements: NSF support (CBET 0730692)

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Date submitted: 21 Nov 2008 Electronic form version 1.4