

Abstract Submitted
for the PSF12 Meeting of
The American Physical Society

Local Thermomechanical Analysis of a Microphase-Separated Thin Lamellar PS-b-PEO Film REGINALD RICE, Kansas State University — We use atomic force microscopy (AFM) and hot tip AFM (HT-AFM) to thermophysically characterize a 30 nm thick film of poly(styrene-block-ethylene oxide), PS-b-PEO, and to modify its lamellar patterns having spacing of 39 ± 3 nm. AFM tip scans of the polymer film induce either abrasive surface patterns or nanoscale ripples, which depend upon the tip force, temperature, and number of scans. The evolution of the lamellar patterns is explained by the polymer film molecular structure and mode I crack propagation in the polymer combined with the stick-and-slip behavior of the AFM tip. The HT-AFM measurements at various tip-sample temperatures and scanning speeds yield several thermophysical quantities.

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Date submitted: 26 Sep 2012

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