Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Anisotropic Dependence of Capillary Dynamics of Confined Polymer Liquid Films YELING DAI, OLEG SHPYRKO, Department of Physics, University of California, San Diego, KYLE ALVINE, Pacific Northwest National Lab, SURESH NARAYANAN, ALEC SANDY, Argonne National Lab — We experimentally investigate the effect of highly anisotropic confinement on the capillary dynamics of polymer liquid films. Polystyrene films confined laterally within line-space silicon grating patterns of varying channel width represent a highly anisotropic liquid. The capillary fluctuation modes of such system can be expected to persist along the direction of the channels, while fluctuations perpendicular to the channels are likely to be suppressed. We utilized X-ray Photon Correlation Spectroscopy (XPCS) to access this capillary wave dynamics. In addition to the channel-width dependence of the capillary relaxation times, we also observe the anisotropic dependence of the capillary wave fluctuations on the confined polymer surface. I will discuss how XPCS can access the directional dependence of capillary dynamics and comment on the role played by interfacial pinning in suppressing capillary fluctuations.

Yeling Dai
Department of Physics, University of California, San Diego

Date submitted: 28 Nov 2010 Electronic form version 1.4