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Structural Characterization of Asymmetric Block Copolymer Thin Films using Resonant Soft X-Ray Scattering J. M. VIRGILI, UC Berkeley and Lawrence Berkeley National Lab, J. B. KORTRIGHT, Lawrence Berkeley National Lab, N. P. BALSARA, R. A. SEGALMAN, UC Berkeley and Lawrence Berkeley National Lab — Resonant soft X-ray scattering (RSOXS) is a powerful tool for structural characterization of block copolymer thin films over very large areas ($\sim 9000 \mu\text{m}^2$). We study a single layer of cylinders formed from an asymmetric poly(styrene-*b*-isoprene) (PS-PI) block copolymer thin film using X-rays tuned to the carbon π^* resonance. These results are compared to bulk structural data obtained by conventional small angle X-ray scattering (SAXS). We demonstrate that the cylinder-to-cylinder spacing is conserved between the bulk and thin film form. In sphere-forming PS-PI block copolymers, we observe a sphere-to-sphere spacing in thin films that is between the bulk nearest neighbor and bulk lattice spacing. RSOXS' capability in probing complex multi-block copolymers by tuning to different energy edges and also of probing a variety of film thickness effects will also be discussed.

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