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Fluctuation-Induced Line-Edge Roughness in Nano-Confined Block Copolymer Thin Films AUGUST BOSSE, RONALD JONES, ALAMGIR KARIM, Polymers Division, National Institute of Standards and Technology — Block copolymer (BCP) thin film systems are currently under intense scrutiny as a potential nano-scale fabrication mask for pattering next-generation semi-conductors and magnetic media on the 5 to 20 nm scale. However, there are certain fundamental issues that need to be resolved, or at least well understood, if BCP systems are going to evolve into a feasible fabrication tool, most notable of which is the scale and system-parameter-dependence of microdomain–matrix-interface line-edge roughness (LER). We present a computational study of microdomain–matrix-interface LER for a nano-confined AB diblock copolymer thin film. The BCP system was simulated using a field-theoretic sampling technique based on a "hybrid" mean-field–Monte Carlo framework. We present a summary of our simulation technique, and we examine the dependence of LER on the Flory χ parameter and the copolymer molecular weight.

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