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Lateral Confinement Effects in Block Copolymer Thin Films AUGUST BOSSE, Physics, University of California, Santa Barbara, SCOTT SIDES, Chem. E., University of California, Santa Barbara, CARLOS GARCIA-CERVERA, Mathematics, University of California, Santa Barbara, GLENN FREDRICKSON, Chem. E. and Materials, University of California, Santa Barbara — In recent years there has been increased interest in using microphase separated block copolymer thin films as sub-micron masks in the fabrication of semiconductor devices and high-density magnetic storage media. However, if these techniques are to evolve into a practical lithography scheme, one must have an understanding of and control over in-plane defects within the block copolymer microstructure. The topic of defects in block copolymer thin films has garnered significant attention in the experimental sector. However, little theoretical work has appeared on this subject. In this talk, we discuss a technique for field-based modeling of thin films of block copolymer melts subject to lateral confinement. We apply pseudo-spectral, large-cell self-consistent field theory (SCFT) simulations with confining boundary conditions based of the work of Matsen. Our investigations are aimed at elucidating the role of the following factors on defect populations: the shape and size of the confining boundaries, the nature of the interactions between the copolymer segments and the boundaries, copolymer architecture, and annealing procedure applied.

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