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**Practical Implementation of Order Parameter Calculation for Directed Assembly of Block Copolymer Thin Films** CHI-CHUN LIU, GORDON CRAIG, PAUL NEALEY, Dept of Chem and Bio Engineering, Univ of Wisconsin-Madison, RICARDO RUIZ, Hitachi Global Storage Technologies, San Jose Research Center, NICOLA FERRIER, Dept of Mech Engineering, Univ of Wisconsin-Madison — The assembled morphologies in thin films of block copolymers are gaining interest for potential applications in advanced lithography and template fabrication due to their low defect density, pattern rectification, and resolution enhancement. For such applications, the ability to quantify the extent of order achieved with different assembly methods and materials is crucial. Previous studies analyzed the translational order parameter ($\Psi$T) based on reciprocal lattice vectors obtained from Fourier Transforms, but discussed neither the accuracy of these vectors nor the effect of domain positioning on the calculation results. In both simulations and real systems we have shown the inaccuracy of these parameters can lead to huge difference in $\Psi$T. Here we present a computational procedure to delineate the importance of these parameters and analyze with a high level of accuracy the translational and orientational order parameters of the guiding pattern, the domains of a block copolymer directed to assemble on this pattern, as well as the underlying structure after lift-off. We observe that order can be preserved over a large area and can be retained in subsequent processing.

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