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**Inverse Solution for Directed Self-Assembly of Thin Film Cylindrical Morphology Block Copolymers** ADAM HANNON, KEVIN GOTRIK, ALFREDO ALEXANDER-KATZ, CAROLINE ROSS, MIT — Using topographical templates, the directed self-assembly of thin film cylinder forming block copolymers has allowed for the fabrication of complex patterns with the sub-20nm length scales necessary for nanolithography. However, the templates for these circuit-like patterns have been developed from empirical methods that require either experimental examination of many input templates or time-consuming simulations over a wide parameter space. To address this problem, we have developed an inverse self-assembly algorithm that allows for the prediction of the template necessary to obtain a desired target pattern which includes bends, junctions, and terminals. The model system has been optimized for comparison with a cylindrical PDMS-PS block copolymer (45.5 kg/mol molecular weight and PDMS volume fraction 33.5% ) under equilibrium neutral solvent annealing conditions. Example target structures are shown with the resulting predicted template found from the algorithm and compared with traditional simulation methods using those templates.

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