Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Orthogonal Self-Assembly of Block Copolymer Thin Films on Minimal Topographic Patterns JAEWON CHOI, YINYONG LI, University of Massachusetts, Amherst, FENG LIU, Lawrence Berkeley National Laboratory, KENNETH CARTER, THOMAS RUSSELL, University of Massachusetts, Amherst
— We have studied the orthogonal self-assembly behavior of cylinder-forming block copolymers (BCPs) on minimal topographic patterns. When BCP film thickness was comparable to the natural period of BCP (L_0), it was found that cylindrical microdomains oriented parallel to the film surface were randomly oriented on the minimal topographic pattern with the confinement depth of $0.71L_0$. With increasing the film thickness, these microdomains became more aligned orthogonal to the direction of the underlying minimal topographic pattern, eventually generating orthogonally aligned line patterns at the film thickness of $1.70L_0$. We also found that the confinement depth of the minimal topographic pattern was an important factor to induce orthogonal self-assembly of BCP thin films. The lateral ordering of orthogonally aligned line patterns were characterized using grazing incidence small angle X-ray scattering (GISAXS), where an orientation parameter was found to be 0.997.

Jaewon Choi
Univ of Mass - Amherst

Date submitted: 11 Nov 2016 Electronic form version 1.4