Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Circular Patterns over Large Areas from The Self-Assembly of Block Copolymers Guided by Shallow Trenches SUNG WOO HONG, XIAODAN GU, University of Massachusetts Amherst, JUNE HUH, Yonsei University, SHUAIGANG XIAO, Seagate Technology, THOMAS RUSSELL, University of Massachusetts Amherst — We report the fabrication of ultra-dense circular nanoarrays of block copolymer (BCP) microdomains over macroscopic areas. These arrays were generated by the directed self-assembly of BCPs on the topographically patterned substrates, where the trenches with circular shape are patterned on a flat substrate. The width of circular trench and the distance between circular trenches are varied for commensurability issues, and difference BPCs are used to demonstrate the generality of this strategy. When a commensurability condition is satisfied, BCPs on the topographically patterned substrates undergo a grapho-epitaxial self-assembly with solvent annealing, resulting in an areal density amplipication of the circular patterns over large areas. The methodology described here may provide an easy approach to high densities of circularly shaped nanopatterns for data storage applications.

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Date submitted: 18 Nov 2010 Electronic form version 1.4