MAR10-2009-007379

Abstract for an Invited Paper
for the MAR10 Meeting of
the American Physical Society

Experimental Studies of Defects in (Co)polymer Nanosystems

ALEXANDER HEXEMER, LBNL

We presented an approach of creating surfaces with Gaussian curvature gradients by using commercially available colloidal particles and standard processing techniques. We also demonstrated that these non-flat surfaces can induce regions of both high order has well as disorder in cylindrical block copolymer films depending on the Gaussian curvature of the surface. On a flat surface the ground state has no preferential direction and a high density of disclinations is observed. A Gaussian curvature destroys the isotropy in alignment and induces a preferential alignment. For small bumps the cylinders wrap around the top of the bump with a constant density of disclinations and dislocations as a function of distance from the top. Larger bumps show a disordered phase in a region on the top of the bump. The disorder is induced by the migration of disclinations towards the top of the bump.