Experimental Studies of Defects in (Co)polymer Nanosystems
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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 and 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.