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Dynamics of block copolymer / nanoparticle composites[1] ANDREI ZVELINDOVSKY, MARCO PINNA, University of Central Lancashire, IGNACIO PAGONABARRAGA, University of Barcelona — We present results of a large scale coarse grained computer simulation for block copolymer nanoparticle composites, Hybrid Cell Dynamics Simulation. Dynamics of the nanoparticles is found to strongly influence block copolymer nanostructure dynamics and vice versa. Different ratios of nanoparticle diameter and block copolymer domain spacing were investigated. The effect of the external fields such as electric or magnetic fields on the dynamics of the particles was incorporated into the computer model and found to influence block copolymer matrix structure. For example, the nanoparticles can controllably induce phase transitions between different block copolymer morphologies. The simulation results gave insights on underlying physical mechanisms in recent experiments on such systems.

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Andrei Zvelindovsky
University of Central Lancadshire

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