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Ultrathin block copolymer films under shear[1] MARCO PINNA, ROBERTA DESSI, ANDREI ZVELINDOVSKY, University of Central Lancashire
— Ultrathin block copolymer films of 1-2 microdomains thick were investigated by means of a large scale coarse grained computer simulation, Cell Dynamics Simulation. Our simulation method allowed to computationally reach the size scale of experimental samples and to explain some recent experiments on sheared lamellae and cylindrical block copolymer morphologies. A detailed dynamical phase diagram, which covered parallel and perpendicular lamellae and cylinders, as well as perforated lamellae, was constructed. The crucial role of defects in orientation phase transitions and structure ordering and non-trivial defects dynamics was found. Our results provide detailed insights into how to use shear to control and manipulate block copolymer structure in thin films.

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Marco Pinna
University of Central Lancashire

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