

Abstract Submitted  
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**How do grafting points influence the structure formation in binary and one-component polymer brushes?** MARCUS MÜLLER, University of Wisconsin, Madison, WI 53706-1390, LUDGER WENNING, Johannes Gutenberg-Universität, 55099 Mainz, Germany — Grafting of incompatible polymers onto a substrate one prevents macroscopic phase separation. Theory predicts a rich phase diagram of laterally periodic morphologies of brushes consisting of incompatible polymers or one-component brushes in a bad solvent, however, structures observed in experiments lack long-range periodic order.

We employ MC simulations of a coarse-grained model to investigate the influence of spatial correlations of the grafting points (patterns) onto the morphology of one component brushes in a bad solvent and binary brushes. Comparing morphologies on identical sets of grafting point we observe a pronounced correlation between the average morphology of the brush and density fluctuations of the grafting points. These fluctuations prevent long-range ordering. Rather than a sharp thermodynamic transition, we observe a gradual building up of local structure upon increasing the incompatibility. The structure formation occurs at smaller incompatibility and the length scale is slightly larger than in case of grafting on a regular lattice. Different morphologies as a function of composition give rise to very similar structure factors but can be well distinguished by their Euler-characteristics.

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