Abstract Submitted
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Liquid Crystalline Phases of Polymer Brushes[1] KIANA AMINI, NASSER ABUKHDEIR, MARK MATSEN, University of Waterloo — The phase behavior of liquid-crystal polymeric brushes in solvent are investigated using self-consistent field theory. The polymers are modeled as freely-jointed chain consisting of N rigid segments. The isotropic interactions between the polymer and the solvent are treated using the standard Flory-Huggins theory, while the anisotropic liquid-crystalline (LC) interactions between rigid segments are taken into account using the Mayer-Saupe theory. For weak LC interactions, the brush exhibits the conventional parabolic-like profile, while for strong LC interactions, the polymers crystallize into a dense brush with a step-like profile. At intermediate interaction strengths, we find the microphase-segregated phase observed previously for lattice-model calculations.[2] In this phase, the brush exhibits a crystalline layer next to the grafting surface with an external layer similar to the conventional brush.

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[2]V. M. Amoskov, T. M. Birshtein, and V. A. Pryamitsyn, Macromolecules, **31**, 3720 (1998).

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