

Abstract Submitted
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Structures of One and Two Polymer Mushrooms DELIAN YANG, QIANG WANG, Department of Chemical and Biological Engineering, Colorado State University — A polymer mushroom here is referred to as a group of chains end- grafted at the same point on a flat and impenetrable substrate. Using lattice self-consistent field (LSCF) calculations with the Kronecker δ -function interactions (instead of the commonly used nearest-neighbor interactions), we have studied the structures of one and two polymer mushrooms in an explicit solvent as a function of the polymer volume fraction in the system, solvent quality characterized by the Flory-Huggins χ parameter, and distance between the two mushrooms. Since LSCF results are exact only in the limit of number of chains $n \rightarrow \infty$, we also use fast lattice Monte Carlo (FLMC) simulations¹ with the same Hamiltonian as in LSCF theory to examine how this limit is approached with increasing n . Direct comparisons between LSCF and FLMC results without any parameter-fitting quantify the fluctuation/correlation effects neglected in LSCF theory.

¹Q. Wang, **Soft Matter**, **5**, 4564 (2009).

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