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Confinement of Equilibrium Polymers EDWARD FENG, GLENN FREDRICKSON, UCSB — We consider supramolecular polymer systems in which reversible intermolecular bonding affects the thermodynamics of the system. While we have formulated models for a number of such systems, this presentation focuses on equilibrium polymers in which monomers can reversibly link together to form linear polymers. This serves as a model for giant micelles of surfactant molecules that can break and recombine at any point along the cylindrical micelle. While equilibrium polymers in bulk environments have been studied, we investigate their behavior in confined environments such as between two parallel plates. Our model features a continuous distribution of polymer lengths and assumes a favorable energy decrease when two monomers form a bond. We are interested in how confinement affects the density profile and the polymer length distribution, and we calculate these properties analytically using the ground state dominance approximation and computationally employing self-consistent field theory.

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