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Coherent States Formulation of Polymer Field Theory[1] XINGKUN MAN, Department of Chemical Engineering and the Materials Research Laboratory, University of California, Santa Barbara, KRIS DELANEY, Department of the Materials Research Laboratory, University of California, Santa Barbara, GLENN FREDRICKSON, Department of Chemical Engineering and the Materials Research Laboratory, University of California, Santa Barbara, HENRI ORLAND, Institut de Physique Theorique, CEA-Saclay, France — We developed a coherent-states formulation of equilibrium polymer field theory. Compared with the traditional Edwards' auxiliary field framework that underpins both field-theoretic simulation (FTS) and self-consistent field theory (SCFT) methods, this formulation has a number of attractive features, including much more local operators and a finite order polynomial action. The formalism is developed in the grand canonical ensemble for the Edwards model of polymers in an implicit solvent, and we show how to derive a numerically tractable scheme. We explore the efficiency and stability of the method in mean-field and fully fluctuating simulations for a polymer solution confined to a slit in one dimension.

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