

MULTILEVEL MONTE CARLO FOR THE SIMULATION OF DILUTE POLYMERS

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Polymers immersed in a fluid can be modelled as chains connected by finitely-extensible bonds with nonlinear elastic potentials, subject to random forcing. In this work we discuss the simulation of the system of coupled SDEs which results from the modelling, and the use of multilevel Monte Carlo (MLMC) to efficiently estimate expectations arising from the associated equilibrium distribution. One important element is the use of adaptive timestepping which can be incorporated fairly easily into MLMC. Another is the use of a new multilevel coupling idea developed by Glynn and Rhee (2014) for the simulation of equilibrium expectations in the context of contracting Markov Chains.

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