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Monte Carlo simulation and self-consistent integral equation theory for polymers in quenched random media BONG JUNE SUNG, ARUN YETHIRAJ, University of Wisconsin-Madison — The structure of polymers in quenched random media is studied using self-consistent integral equation theory and Monte Carlo (MC) simulations. The theory combines field theoretic methods with the replica symmetric polymer reference interaction site model (RSP) theory of Yethiraj. Self-consistent RSP theory is in good agreement with MC simulations for the pair correlation functions at high polymer densities but the theoretical predictions are not as good when the polymer density is low. The size of a chain, characterized by the rootmean square radius of gyration, R_g, is predicted to be a strong function of the size of the matrix particles. When the size of the matrix particles is comparable to the chain monomer size, R_g is a non-monotonic function of polymer volume fraction. On the other hand, when the size of the matrix particles is comparable to R_g, the chain size is a monotonically decreasing function of the polymer volume fraction.

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