Abstract Submitted
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Replica exchange simulations of the three-dimensional Ising spin glass: static and dynamic properties[1] BURCU YUCESOY, JONATHAN MACHTA, Department of Physics, University of Massachusetts Amherst, HELMUT G. KATZGRABER, Department of Physics, Texas A&M University & ETH Zurich — We present the results of a large-scale numerical study of the equilibrium three-dimensional Ising spin glass with Gaussian disorder. Using replica exchange (parallel tempering) Monte Carlo, we measure various static, as well as dynamical quantities, such as the autocorrelation times and round-trip times for the replica exchange Monte Carlo method. The correlation between static and dynamic observables for 5000 disorder realizations ($N \leq 10^3$ spins) down to very low temperatures ($T \approx 0.2T_c$) is examined. Our results show that autocorrelation times are directly correlated with the roughness of the free energy landscape. We also discuss the size dependence of several static quantities.

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