

Abstract Submitted
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Evidence of Non-Mean-Field-Like Low-Temperature Behavior in the Edwards-Anderson Spin-Glass Model¹ BURCU YUCESoy, University of Massachusetts Amherst, HELMUT G. KATZGRABER, Texas A&M University, ETH Zurich, JONATHAN MACHTA, University of Massachusetts Amherst — The three and four-dimensional Edwards-Anderson and mean-field Sherrington-Kirkpatrick Ising spin glasses are studied via large-scale Monte Carlo simulations at low temperatures, deep within the spin-glass phase. Performing a careful statistical analysis of several thousand independent disorder realizations and using an observable that detects peaks in the overlap distribution, we show that the Sherrington-Kirkpatrick and Edwards-Anderson models have a distinctly different low-temperature behavior. The structure of the spin-glass overlap distribution for the Edwards-Anderson model suggests that its low-temperature phase has only a single pair of pure states.

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