Correlation length of the two-dimensional Ising spin glass with bimodal interactions HELMUT KATZGRABER, Theoretische Physik, ETH Hoenggerberg, LIK WEE LEE, University of California, Santa Cruz — We study the correlation length of the two-dimensional Edwards-Anderson Ising spin glass with bimodal interactions using a combination of parallel tempering Monte Carlo and a rejection-free cluster algorithm in order to speed up equilibration. Our results show that the correlation length grows $\sim \exp(2J/T)$ suggesting through hyperscaling that the degenerate ground state is separated from the first excited state by an energy gap $\sim 4J$, as would naively be expected.

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