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Noise as a Probe of Ising Spin Glass Transitions[1] ZHI CHEN, CLARE YU, University of California, Irvine — Noise is ubiquitous and and is often viewed as a nuisance. However, we propose that noise can be used as a probe of the fluctuations of microscopic entities, especially in the vicinity of a phase transition. In recent work we have used simulations to show that the noise increases in the vicinity of phase transitions of ordered systems. We have recently turned our attention to noise near the phase transitions of disordered systems. In particular, we are studying the noise near Ising spin glass transitions using Monte Carlo simulations. We monitor the system as a function of temperature. At each temperature, we obtain the time series of quantities characterizing the properties of the system, i.e., the energy and magnetization. We look at different quantities, such as the noise power spectrum and the second spectrum of the noise, to analyze the fluctuations.

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