

Abstract Submitted  
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**Typical Value of Susceptibilities in the Three Dimensional Edwards-Anderson Spin Glass Model in an External Field**<sup>1</sup> SHENG FENG, KA-MING TAM, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, LA 70803, USA, YE FANG, J. RAMANUJAM, ECE Division, School of Electrical Engineering and Computer Science, Louisiana State University, Baton Rouge, LA 70803, USA, JUANA MORENO, MARK JARRELL, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, LA 70803, USA — We study the Edwards-Anderson model on a simple cubic lattice with a finite constant external field using a Monte Carlo simulation code, which employs graphics processing units to dramatically speedup the simulation. Conventional indicators, such as the Binder ratio and correlation length, do not show any signs of a phase transition. We also studied  $R_{12}$ , or the ratio of spin glass susceptibilities at finite wavenumbers, and show it is quite noisy that a systematic analysis cannot come to clear conclusion. This is largely due to the fact that the susceptibilities follow a broad, fat-tailed distribution, and the average is possibly dominated by rare events. Therefore we propose to study the typical value of these parameters by taking the geometric average over different disorder realizations, and compare it with the linear average measurements. We argue that the typical value should be also studied in addition to conventional linear average value, to provide another perspective for the study of phase transition in spin glasses.

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