

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Dynamic Monte Carlo rate constants for magnetic Hamiltonians coupled to a phonon bath¹ LAZARUS SOLOMON, MARK NOVOTNY — For quantitative comparisons between experimental time-dependent measurements and dynamic Monte Carlo simulations, a relation between the time constant in the simulation and real time is necessary. We calculate the transition rate for spin S system using the lattice frame method for a rigid spin cluster in an elastic medium [1]. We compare this with the transition rate for an Ising spin $\frac{1}{2}$ system using the quantum-mechanical density-matrix method [2] with the results of ref [1,3]. These transition probabilities are different from those of either the Glauber or the Metropolis dynamics, and reflect the properties of the bosonic bath. Comparison with recent experiments [4] will be discussed.

[1] E. M. Chudnovsky, D. A. Garanin, and R. Schilling (PRB 72, 2006)

[2] K. Park, M. A. Novotny, and P. A. Rikvold (PRE 66, 2002)

[3] K Saito, S. Takesue, and S. Miyashita, (PRE 61, 2002) [4] T. Meunier et al (Condensed Matter, 2006)

¹This work was supported by partial funding from the National Science Foundation grant No. DMR 0426488

Lazarus Solomon

Date submitted: 28 Dec 2006

Electronic form version 1.4