Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Heat diffusion in a classical Heisenberg chain[1] GONZALO GUTIERREZ, University of Chile, Chile, EDUARDO VALDEBENITO, University of Chile, SERGIO DAVIS, Royal Institute of Technology, Sweden — We study the heat transport in a one dimensional classical Heisenberg chain by means of spin dynamics simulation. The system consists of a $N = 2000$ spins in the microcanonical ensemble, and the temperature is evaluated using the so-called configurational temperature formula. We thermalize the system to an equilibrium state at low temperature, and then we give a delta function energy packet in the middle of the chain. Studying both qualitatively and quantitatively the spreading of the delta, we characterize the diffusion of heat in the chain. In fact, calculating the second moment of the pulse, and using the relation

$$\left\langle \sigma(t)^2 \right\rangle = 2Dt^{\alpha}, \ \ (0 < \alpha < 2), \tag{1}$$

where σ is the width of the pulse, D is the diffusion constant and α is a parameter which consider the kind of diffusion. According our simulation, the heat in this system transports subdiffusively. This result imply that the system becomes a thermal insulator in the thermodynamic limit $N \to \infty$.

[1]Grant Anillo ACT/24-Chile.

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Date submitted: 27 Nov 2007 Electronic form version 1.4