Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

**Local Temperature Measurement of Avalanche Front in Mn12-Acetate** SEAN MCHUGH, M.P. SARACHIK, Y. SUZUKI, R. JAAFAR, Department of Physics, City College of New York/CUNY, Y. MYASOEDOV, E. ZELDOV, A. FINKLER, Department of Condensed Matter, Weizmann Institute of Science, R. BAGAI, G. CHRISTOU, Department of Chemistry, University of Florida — Local magnetization measurements using micro-Hall bars have recently revealed that a magnetic avalanche propagates as a narrow front moving with subsonic speed. In analogy with chemical deflagration (or combustion), we have proposed "magnetic deflagration," a thermodynamic process by which the reversing spins produce heat stimulating the reversal of neighboring spins in the crystal [1]. Based on this model, a simple calculation yields a "flame front" temperature of the order of 10 K or higher. Although it has been established that the average temperature exhibits a (small) increase, confirmation of this model requires local, fast measurements of the temperature of the front. We describe experimental progress using $\mu$m sized arrays of germanium thermometers.

[1] Y. Suzuki, et. al., Phys. Rev. Lett. 95, 147201 (2005).

Sean McHugh
City College of New York/CUNY

Date submitted: 24 Nov 2006 Electronic form version 1.4