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Spatial Determination of Magnetic Avalanche Ignition points REEM JAAFAR, S. MCHUGH, YOKO SUZUKI, M.P. SARACHIK, Department of Physics, City College of New York/CUNY, New York, NY, Y. MYASOEDOV, H. SHTRIKMAN, E. ZELDOV, Department of Condensed Matter Physics, The Weizmann institute of Science, Rehovot, Israel, R. BAGAI, G. CHRISTOU, Department of Chemistry, University of Florida, Gainesville, FL. — Using time-resolved measurements of local magnetization [1], we report studies of the propagation of magnetic avalanches (fast magnetization reversals) in Mn12-ac crystals triggered stochastically in response to a time-varying (swept) magnetic field. The spherical nature of the fronts produced by avalanches originating within the bulk is reflected in the time-of-arrival at an array of micro-Hall sensors placed on the surface of the sample. By treating the propagating front as a spherical bubble of radius $r \propto t$, we locate the approximate ignition points in a two-dimensional cross-section of the crystal. The trigger points are stochastically distributed (some in the bulk and some at the edges), with higher density regions that vary from sample to sample. This suggests that avalanches originate preferentially in weak regions of a crystal where the defect density is high.

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

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