Abstract Submitted
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Quantum deflagration in Mn_{12}-acetate in the presence of a transverse field PRADEEP SUBEDI, New York University, SAUL VELEZ, University of Barcelona, SHIQI LI, MYRIAM SARACHIK, CCNY, CUNY, JAVIER TEJADA, University of Barcelona, ANDREW KENT, New York University, SHREYA MUKHERJEE, GEORGE CHRISTOU, UF-Gainesville — Mn_{12}-acetate single crystal have been shown to exhibit abrupt reversal of the magnetic moment through propagation of a narrow front at subsonic velocities, termed magnetic deflagration [1]. Experiments where avalanches in Mn_{12}-acetate are triggered at a fixed applied field have shown that the velocity of the front has maxima at resonant fields (kH_o, H_o = 0.45 T, k>1), due to thermally assisted tunneling of magnetization [2]. Application of a transverse field increases the tunnel splitting, which increases the magnetic relaxation and allows us to explore the deflagration for the first time at small longitudinal fields (k=0 and 1). Using time resolved measurements of local magnetization by an array of micron sized Hall sensors at temperature of 350 mK, we present the measurements on both spontaneously ignited and triggered deflagration for a large transverse field (> 3 T) allowing us to explore directly the effect of a significant tunneling splitting on both the ignition and the velocity of the front. [1] Y. Suzuki, et. al PRL 95, 147201 (2005)
[2] A. Hernandez-Minguez, et. al, PRL 95, 217205 (2005)

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