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Spontaneous Magnetic Deflagration of Mn_{12}tBuAc in a Transverse Field[1] YIZHANG CHEN, A. D. KENT, New York University, QING ZHANG, M. P. SARACHIK, City College of New York, MICHAEL L. BAKER, New York University & City College of New York, D. A. GARANIN, Lehman College of CUNY, NAJAH MHESN, CHRISTOS LAMPROPOULOS, University of North Florida — Magnetic deflagration has been triggered in molecular magnets with a swept longitudinal magnetic field [1], acoustic waves [2], and by applying a heat pulse [3-4]. In this work we report a study of the conditions for the spontaneous ignition of magnetic deflagration in the axially symmetric single molecule magnet Mn_{12}tBuAc. The onset of spontaneous deflagration shows clear resonant features in the $H_x \otimes H_z$ plane; here H_z is the longitudinal magnetic field, the bias that reduces the height of the magnetic anisotropy barrier, and H_x is the field transverse to the easy axis that mixes spin states on opposite sides of the anisotropy barrier. Consistent with expectations, the conditions (H_x, H_z) for spontaneous ignition vary with temperature. We show that the speed of the deflagration fronts are strongly reduced near quantum tunneling resonances due to magnetic relaxation prior to spontaneous deflagration events.

[1] Yoko Suzuki *et al.*, PRL **95**, 147201 (2005); [2] A. Hernández-Mínguez *et al.*, PRL **95**, 217205 (2005); [3] S. McHugh *et al.* PRB **76**, 172410 (2007); [4] P. Subedi *et al.*, PRL **110**, 207203 (2013).

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