Abstract Submitted
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The role of quantum tunneling in magnetic avalanches in Mn_{12}-acetate[1] XIANG MA, BO WEN, S. MCHUGH, M.P. SARACHIK, City College of New York, Y. MYASOEDOV, H. SHTRIKMAN, E. ZELDOV, The Weizmann Institute of Science, R. BAGAI, G. CHRISTOU, University of Florida - Gainesville — Steps occur in the hysteresis loop of the molecular magnet, Mn_{12}-ac due to quantum tunneling at "resonant" magnetic fields where the energies of levels on opposite sides of the anisotropy barrier corresponding to different spin projections cross. The effect of quantum tunneling is also evident when magnetic relaxation occurs abruptly as a magnetic avalanche where spin reversal occurs along a narrow front that travels at subsonic speed. In particular, studies have shown that the ignition temperature displays minima and the velocity of the avalanche front shows maxima at the resonant fields. We report measurements of the avalanche speeds triggered in an external magnetic field applied at an angle with respect the c-axis of the crystal, where the transverse component provides a symmetry-breaking field that increases the tunneling rate and magnetic relaxation.

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