Abstract Submitted
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Hall magnetometry measurements of the susceptibility of variants of Mn_{12}-ac[1] PRADEEP SUBEDI, A.D. KENT, NYU, B. WEN, M.P. SARACHIK, CCNY, Y. YESHURUN, Bar-Illan, A.J. MILLIS, Columbia U, S. MUKHERJEE, G. CHRISTOU, UF-Gainsville — The temperature dependence of the inverse magnetic susceptibility of both Mn_{12}-ac and Mn_{12}-ac-MeOH is found to give finite temperature intercepts, indicating a ferromagnetic phase at low temperature [1, 2]. A magnetic field applied transverse to the Ising axis suppresses the Curie temperature, T_{CW}, to a $T = 0$ quantum critical point. However, the decrease of T_{CW} with transverse field, $H_\perp$, in Mn_{12}-ac does not agree with mean field calculations performed with a spin Hamiltonian that includes dipolar interactions between molecules and $H_\perp$ effects. We attribute the pronounced suppression of T_{CW} of Mn_{12}-ac to the effect of random fields arising from a distribution of molecular easy axis tilts due to ligand disorder [1]. Mn_{12}-ac-MeOH is of interest in this regard because it appears to have no ligand disorder. We discuss these experiments as well as ongoing studies of Mn_{12}-toluate, a faster relaxing variant of Mn_{12}, which has a lower effective anisotropy barrier that permits the study of the susceptibility in larger $H_\perp$ at very low temperature.
[1] Wen et.al PRB **82**, 014406 (2010)
[2] Li et.al PRB **82**, 174405 (2010)

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