Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Spin glassiness and power law scaling in anisotropic triangular spin-1/2 antiferromagnets ALEXANDER SEIDEL, JIAN WU, JULIA S. WILDEBOER, FLETCHER WERNER, ZOHAR NUSSINOV, S.A. SOLIN, Washington University in St. Louis — We discuss the magnetic properties of a class of spin $S = 1/2$ antiferromagnetic quasi-triangular lattice materials, both in the clean limit and in the presence of non-magnetic Zn impurities. These systems are long organic chain intercalated derivatives of copper hydroxy nitrate, with a very large c-axis separation of 24Å. In these compounds, we find that a spin glass phase is universally preceded by two different power law regimes in the temperature dependence of the DC magnetic susceptibility, separated by a sharp crossover. This is seen both in the presence as well as in the absence of non-magnetic Zn impurities, where the power law exponents are surprisingly unperturbed by the compositional disorder. We argue that these findings may be consistent with a picture based on a self-generated spin glass in the clean undoped compound, where frustration is the driving mechanism of the glassiness rather than disorder. While AC measurements and time dependent magnetization follow traditional spin glass paradigms, the power law structure found in the DC susceptibility is argued to deviate in various ways from scenarios expected based on Griffiths type physics, and may call for new explanations. [1] J. Wu et al., J. Phys. Condens. Matter, 22, 334211 (2010). [2] J. Wu et al., arXiv:1007.0442

Jian Wu
Washington University in St. Louis

Date submitted: 02 Feb 2011 Electronic form version 1.4