Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Measurements of $1/f$ Noise in $Cu_{86.5}Mn_{13.5}$ Thin Films[1] DAVID HARRISON, E DAN DAHLBERG, University of Minnesota - Twin Cities, RAYMOND ORBACH, Texas Materials Institute, The University of Texas at Austin, Austin, Texas 78712. — We have measured the $1/f$ noise in the spin glass state of $Cu_{86.5}Mn_{13.5}$ films. Our results are consistent with previous measurements that have demonstrated low-frequency resistance fluctuations abruptly increase in magnitude as a spin glass is cooled through its glass temperature [1]. The noise originates from fluctuations in the orientation of the local magnetic moments ("spins") within the spin glass. The importance of developing techniques to study the spin glass state in films such as these is the measurements require less material for an acceptable signal-to-noise than conventional magnetometry (e.g. SQUID) measurements. This reduced volume of material required for experiments makes noise measurements ideal for mesoscale studies of the spin glass state and the effects of reduced dimensionality. For example, one might observe in the noise spectrum the crossover from time dependent correlation length growth $\xi(t,T)$ to saturation when $\xi(t,T) = \mathcal{L}$, where $\mathcal{L}$ is a dimension characteristic of the mesoscale. [1] Israeloff, N. E., et al. "Electrical noise from spin fluctuations in CuMn." Physical review letters 63.7 (1989): 794.

[1]This work was supported by the U.S. Department of Energy, Office of Basic Energy Sciences, Division of Materials Science and Engineering, under Award DE-SC0013599.

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Date submitted: 10 Nov 2016 Electronic form version 1.4