

Abstract Submitted  
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**Magnetic Phase Separation in  $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$  Single Crystals using  $^{139}\text{La}$  NMR.** ROBERT X. SMITH, MICHAEL J.R. HOCH, PHILIP L. KUHNS, WILLIAM G. MOULTON, GREGORY S. BOEBINGER, ARNEIL P. REYES, National Magnet Lab, CHRIS LEIGHTON, Dep. of Chem. Eng. and Mat. Sci., Univ. of Minn, JOHN MITCHELL, Argonne National Lab — Nano-scale phase separation appears to occur in a number of doped transition metal oxides and has been shown to be important in the cobaltites. LSCO is a mixed valence ( $\text{Co}^{3+}$ ,  $\text{Co}^{4+}$ ) near-cubic perovskite. We report  $^{139}\text{La}$  NMR experiments on nanoscale phase separation in single crystals complementing earlier work on sintered powders<sup>1</sup>. Concentrations in the range  $x=0.05$  to  $0.30$ , spanning the metal-insulator transition at  $x=0.18$ , were used. Spectra for  $x=0.30$  reveal a single peak showing long-range FM order with an internal transferred hyperfine field of  $2.5\text{T}$ , at the La site. NMR spectra for samples with  $x<0.30$  show asymmetric peaks that can be well fitted with two Gaussian's, evidence of FM and spin/cluster-glass magnetic phases. A droplet model has been proposed in the literature, where Co neighbors interact via double exchange in hole-rich regions to form the FM phase. We find magnetic phase separation persists over a narrower  $x$  range in the single crystals than in previously studied sintered samples<sup>1</sup>. 1) M.J.R Hoch et al. PRB 70, 174443 (2004)

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