

Abstract Submitted
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Dynamical behavior of spin clusters in $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ ROBERT SMITH, MICHAEL HOCH, WILLIAM MOULTON, PHILLIP KUHNS, GREGORY BOEBINGER, ARNEIL REYES, National High Magnetic Field Lab, JOHN MITCHELL, Argonne National Lab — Previous work has provided evidence for magnetic glassy behavior in the hole-doped cobaltite system $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ (LSCO). Models proposed to describe the interesting and unusual magneto-transport properties of LSCO involve hole-rich clusters in a hole-poor matrix. The glassy properties, which are not well understood, have variously been interpreted in terms of spin glass and cluster glass components. The present ^{139}La NMR spectral lineshape measurements on single crystal LSCO, that map the hyperfine field distribution in the $x-T$ plane, confirm the presence of magnetic clusters, identified as spin polarons, and provide a phase inhomogeneity diagram. NMR relaxation rates have been used to probe the dynamical behavior of the system at the nanoscale level in macroscopically insulating and metallic samples as a function of temperature in the range 4-280 K. For x less than the metal-insulator critical concentration $x_C = 0.17$ evidence has been obtained for two classes of glassy component with different characteristic correlation time distributions and freezing temperatures. The magnetic glass properties persist above x_C . A spin polaron model is used to explain the results.

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