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A non-Griffiths-like clustered phase above the Curie temperature of the doped perovskite cobaltite $La_{1-x}Sr_xCoO_3$[1]

CHUNYONG HE, MARIA TORIJA, JING WU, University of Minnesota, JEFF LYNN, NIST Center for Neutron Research, JOHN MITCHELL, Argonne National Laboratory, CHRIS LEIGHTON, University of Minnesota —

The existence of preformed clusters above the Tc of the doped perovskite manganites is well established and, in many cases, conforms to the expectations for a Griffiths phase. We show here that the phase-separated perovskite cobaltite ($La_{1-x}Sr_xCoO_3$) also exhibits a clustered state above the Tc in the ferromagnetic phase. The formation of magnetic clusters at a well-defined temperature (T^*) is revealed in the small-angle neutron scattering, d.c. susceptibility, and resistivity. Remarkably, this clustered state has none of the characteristics of a Griffiths phase; the deviation from Curie-Weiss behavior is opposite to expectations and is not field dependent, and T^* does not correspond to the undiluted Tc. These results demonstrate that although the Griffiths phase may occur in many systems with quenched disorder, it is not universally applicable to the randomly doped transition metal oxides.

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Chunyong He
he@physics.umn.edu
University of Minnesota

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