

Abstract Submitted
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Heat capacity study of magneto-electronic phase separation in $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ single crystals.¹ C. HE, University of Minnesota, S. EISENBERG, C. JAN, University of Minnesota, H. ZHENG, J.F. MITCHELL, Argonne National Laboratory, J.W. LYNN, National Institute for Standards and Technology, C. LEIGHTON, University of Minnesota — We present an investigation of the specific heat ($0.35 \text{ K} < T < 270 \text{ K}$) and ordinary Hall effect (300 K) in $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ single crystals ($0.00 < x < 0.30$). The data reveal new information on the nature of the percolation transition, the crystal and electronic structure, and the magneto-electronic phase separation. The observations include a discontinuity in Debye temperature accompanying the percolation-type insulator-metal transition and a large electron mass enhancement, likely due to strong electron correlation effects. The various contributions to the heat capacity provide a detailed picture of the evolution of the phase-separated state with doping. Most importantly, this provides strong evidence for the unanticipated result that the phase separation is restricted to a well-defined doping range, $0.04 < x < 0.22$, in close agreement with recent small-angle neutron scattering.

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