

Abstract Submitted
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Strong current dependence of resistivity in CaMnO_3 ¹ CORNELIU CHIORESCU, University of Miami, JOHN NEUMEIER, Montana State University, JOSHUA COHN, University of Miami — The perovskite manganite CaMnO_3 (CMO) has a G-type antiferromagnetic ground state with Néel temperature $T_N=125\text{K}$. Prior transport measurements in the magnetic and paramagnetic phases^a establish that CMO is a *n*-type semiconductor with $n \sim 10^{18} - 10^{19}\text{cm}^{-3}$ (from native defects like oxygen vacancies) and modestly heavy (large- polaron) mass, $m^* \sim 10m_0$. Here we report transport measurements on single crystal and polycrystalline CMO which reveal a strong current dependence of the resistivity (ρ) at low temperatures where $\rho > 10^6 \Omega \text{ cm}$ and impurity-band conduction predominates. For example, at 30 K, ρ decreases by an order of magnitude for small current densities ($J < 100 \mu\text{A}/\text{cm}^2$), indicating that the effect is not associated with Joule heating. The possible role of spin-polarized hopping in this phenomenon will be discussed.

^a J. L. Cohn, C. Chiorescu, and J. J. Neumeier, Phys. Rev. B **72**, 024422 (2005).

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