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Low

temperature magneto-transport measurements on $\text{Ca}_{1.5}\text{Sr}_{0.5}\text{RuO}_4$ ¹ H.C. CHOI, J.-H. PARK, S.-B. CHO, M.W. MEISEL, Y. LEE, Department of Physics, University of Florida, Gainesville, FL 32611-8440, R. JIN, D. MANDRUS² — In-plane electrical transport measurements were performed on $\text{Ca}_{1.5}\text{Sr}_{0.5}\text{RuO}_4$ in the presence of magnetic fields up to 8 T applied in the direction perpendicular to the plane. Upon substituting Sr with isovalent Ca, $\text{Ca}_{2-x}\text{Sr}_x\text{RuO}_4$ shows an intriguing phase diagram ranging from p-wave superconductor at $x = 2$ to Mott insulator at $x \leq 0.2$. The $x = 0.5$ system investigated in this work is reported to be at the boundary between the magnetic metal ($x < 0.5$) and the paramagnetic metallic phase. A small but distinct increase in resistance was observed at $T^* \approx 450$ mK on warming. In addition, T^* decreases with the applied magnetic field, and the feature in resistance disappears around 500 G. Our detailed magneto-resistance measurements reveal unusual behavior in the low temperature and low magnetic field region that, we believe, is directly related to the resistance anomaly observed near 450 mK in zero magnetic field.

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