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Electrical Transport and Magnetic Behavior of $Pr_{0.5}Ca_{0.5}MnO_3$ Film Grown by Chemical Solution Deposition Technique M. JAIN, Q.X. JIA, Superconductivity Technology Center, MPA, Los Alamos National Laboratory, Los Alamos, NM, F. RONNING, T. PARK, J.D. THOMPSON, Condensed Matter and Thermal Physics, MPA, Los Alamos National Laboratory, Los Alamos, NM — Rare-earth manganites {$R_{1-x}A_xMnO_3$ (R = rare earth, e.g. La, Pr, A = alkaline earth metal, e. g. Ca, Sr)} have attracted much interest because of their rich phenomena like colossal magnetoresistance and charge ordering (CO). For certain values of x, close to 0.5, these compounds undergo a first-order CO transition. The CO state is characterized by the real space ordering of Mn^{3+}/Mn^{4+} in the mixed valent manganite. The CO in bulk $Pr_{1-x}Ca_xMnO_3$ has been widely studied, however, there are very limited studies on thin films of this material. In this work, we have systematically studied the magnetic and electrical behaviors of the $Pr_{0.5}Ca_{0.5}MnO_3$ (PCMO) thin films grown by chemical solution deposition technique on $LaAlO_3$ substrates. The ground state in PCMO was found to be a charge-ordered antiferromagnetic insulator. The CO transition at 235 K was observed. With the application of magnetic field the resistivity of the film decreased at low temperatures. Detailed magnetic and electrical properties of these films will be presented.

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