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Colossal piezoresistance in phase separated manganites¹ MARIA VIITANIEMI, IN HAE KWAK, AMLAN BISWAS, Department of Physics, University of Florida, Gainesville, FL 32611 — Hole-doped manganese oxides (manganites) exhibit piezoresistance, which is defined as a change in electrical resistance as a function of strain. At low temperatures and for particular chemical compositions, manganites can also exist in a thermodynamic phase separated state. In this phase separated state, piezoresistance can increase dramatically, a phenomenon called colossal piezoresistance (CPR). By modifying an existing low temperature probe and measurement setup, we measured the resistance of thin films of the manganite $(\text{La}_{1-y}\text{Pr}_y)_{1-x}\text{Ca}_x\text{MnO}_3$ (LPCMO). We used a three-point beam bending method to control the compressive or tensile strain on these thin films. The resulting change in resistance and thermal hysteresis reveals phase separation and CPR in LPCMO. We are performing similar tests on $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ (LSMO) thin films. LSMO is of interest to us because it may be possible to induce phase separation in this material at room temperature and above.

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