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Transport Noise in Ordered Layered LCMO[1] M.B. WEISSMAN, AKILAN PALANISAMI, MAITRI WARUSAWITHANA, J. ECKSTEIN, Physics, U. of Illinois at Urbana-Champaign — Both intrinsic alloy disorder and strain effects have proposed as important sources of the mixed-phase colossal magnetoresistive regime in manganites We have measured transport properties in films of $La_{2/3}Ca_{1/3}MnO_3$ prepared by atomic-layer-by-layer epitaxy on nearly lattice-matched NGO substrate, both as standard random alloys and as nominally ordered multilayers of $LaMnO_3$ and $Ca_{1/3}MnO_3$. The ordered multilayer samples show a similar transition to the alloys, but with a slightly reduced T_C. The width in T of the coexistence regime, either determined form the standard R(T) or from resistance noise, is actually slightly greater for the ordered samples than for the alloy. In both cases it is much less than found for alloys under tensile strain on STO or films on STO with e-beam damage. The apparent interpretation is that pointlike disorder plays a smaller role than do strain effects and correlated disorder. Other measurements of ac magnetoresistance, non-linear transport, and noise statistics also indicate the importance of strain interactions.

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