

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Reentrant Charge Ordering In Manganites as Experimental Evidence for a “Strain Glass” PETER SHARMA, SUNG BAEK KIM, T. Y. KOO, S. GUHA, S-W. CHEONG, Rutgers University Physics Department — A reentrant charge-ordering transition occurs within the micron scale phase separated manganite $(\text{La,Pr})_{5/8}\text{Ca}_{3/8}\text{MnO}_3$. This low temperature state, in which charge-ordered and ferromagnetic-metallic phases coexist, accompanies spin glass-like magnetism. Furthermore, thermal conductivity measurements reveal an irreversibility characteristic of a freezing transition in the lattice degrees of freedom, strongly suggesting the presence of inhomogeneous long-range strain. Our results point to a unique phase transition from a “strain liquid” to a “strain glass” state where phase-separated regions strongly interact via martensitic accommodation strain resulting in a cooperative freezing of the combined charge/spin/strain degrees of freedom.

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Date submitted: 23 Nov 2004

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