Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Modified doping at cuprate / lanthanum manganite interfaces JACOBO SANTAMARIA, J. GARCIA BARRIOCANAL, A. RIVERA, C. LEON, GFMC. Fac. Fisicas. U. Complutense. Madrid Spain, M. VARELA, Materials Science & Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA, S.J. PENNYCOOK, Materials Science & Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA. , Z. SEFRIOUI, GFMC. Fac. Fisicas. U. Complutense. Madrid Spain — Oxide heterostructures allow combining materials with similar structure but with very different ground states, which may compete at the interface to yield novel behaviors and functionalities. We explore the $YBa_2Cu_3O_7$ (YBCO) / $La_{1-x}Ca_xMnO_3$ (LCMO) interface in thin film heterostructures. For x=0.3 the manganite is ferromagnetic which causes a strong depression of the superconductivity at the YBCO side. There is also a depression of the ferromagnetic moment at the interface suggesting electron transfer from the manganite into the YBCO. This is confirmed from superlattices alternating YBCO and $LaMnO_3$ (LMO), an A- type AF insulator. While for thin LMO layers (< 6 unit cells) there is little effect on YBCO superconductivity, thicker LMO layers result in reduced Tc values and induced ferromagnetism at the interface, thus providing a firm indication of charge transfer. The occurrence of charge transfer over length scales much longer than the Thomas Fermi screening length (1 nm) is a novel behavior which, we hope, will stimulate future theoretical studies. Work supported by CICYT MAT2005 06024 C02-02.

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Date submitted: 20 Nov 2006 Electronic form version 1.4