

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Ferromagnetic tendencies at the surface of AF/CO bulk manganites**<sup>1</sup> SHUAI DONG, RONG YU, SELJI YUNOKI, ELBIO DAGOTTO, Department of Physics and Astronomy, University of Tennessee and Materials Science and Technology Division, Oak Ridge National Laboratory — Previous investigations have shown that the surface of a ferromagnetic (FM) manganite has anti-ferromagnetic (AFM) tendencies. However, the development of ferromagnetism has been observed experimentally in some AFM charge-ordered (CO) manganites by reducing the grain size down to the nanoscale. Similar phenomenon was also found in other nanosized CO oxides, such as  $\text{La}_{1/3}\text{Sr}_{2/3}\text{FeO}_3$ . To clarify these puzzling observations, using Monte Carlo techniques we studied the FM Kondo model, using open boundary conditions to simulate a surface. For some values of the couplings, the previously known tendency to an AFM outer shell was found for the case of a bulk FM state. But for other couplings, the opposite effect was observed: the existence of a FM layer at the surface of a AFM/CO material. Details will be provided in this presentation.

<sup>1</sup>Work supported by NSF DMR-0706020 and by the Division of Materials Science and Engineering, US DOE, under contract with UT-Battelle, LLC

Shuai Dong  
Dept of Physics and Astronomy, University of Tennessee and Materials  
Science and Technology Division, Oak Ridge National Laboratory

Date submitted: 20 Dec 2007

Electronic form version 1.4