Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Electron leakage and double-exchange ferromagnetism at a prototype metal-insulator interface: $CaRuO_3/CaMnO_3$[1] SASHI SATPATHY, Department of Physics University of Missouri, Columbia(MO), BIRABAR NANDA, Department of Physics, University of Missouri, Columbia(MO) — Density-functional studies of the electronic structure of a prototype interface between a paramagnetic metal and an antiferromagnetic insulator ($CaRuO_3$/ $CaMnO_3$) reveal how magnetism near the interface can be modified by the leaked electrons from the metallic to the insulating side. These electrons mediate a ferromagnetic interaction between the interface Mn moments via Anderson-Hasegawa double-exchange, which competes with the already existing antiferromagnetic superexchange, resulting in an interfacial ferromagnetic layer. Electron penetration beyond the first layer is insufficient to alter the bulk antiferromagnetism. We argue that a canted state in the first layer is possible, consistent with earlier magnetic measurements on this system.

[1]This work was supported in part by the U. S. Department of Energy under Grant No. DE-FG02-00ER45818.

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Date submitted: 20 Nov 2006 Electronic form version 1.4