Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Transport at Complex Oxide Interfaces[1] WILLIAM COLE, ANAMITRA MUKHERJEE, NANDINI TRIVEDI, MOHIT RANDERIA, PATRICK WOODWARD, The Ohio State University — We study interface properties and transport in a 'generalized' double exchange Hamiltonian with electron-phonon coupling and superexchange, that can be used to model complex oxides such as the manganites and the double perovskites. The junction between different materials is modeled by imposing different Hamiltonian parameters on either side of an interface layer. We treat both the lattice and the localized spins as slow "classical" degrees of freedom which provide a strongly spatially fluctuating background in which the fast electrons move. We then use classical Monte Carlo to optimize the spin-lattice configuration, minimizing the free energy, while solving the electronic problem through exact diagonalization self consistently with the Poisson equation. We track the charge redistribution, orbital reconstruction and evolution of the magnetic states across the interface and study the transport in the Kubo regime, and discuss implications of our results for manganite and double perovskite interfaces.

[1]Supported by the NSF-MRSEC grant DMR-0820414

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Date submitted: 20 Nov 2009 Electronic form version 1.4