Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

**Variational Wavefunction Monte Carlo method applied to electrons in a two dimensional square lattice with zero doping** SUNITA KANNAN, COURTNEY LANNERT, Wellesley College — We present the theoretical results from the Variational Wavefunction Monte Carlo method applied to electrons in cuprates, of a two dimensional square lattice with zero doping. Since the true Hamiltonian of the cuprates is not definitively known, much study has gone into identifying the best possible Hamiltonian. To do this, we vary the terms in the Extended Heisenberg Hamiltonian - the neighbor spin coupling term J, the spin next-neighbor term J' and the spin ring exchange term Jring, where each variation represents a different electronic interaction. We then use the variational approach to find the best groundstate wavefunction for each model Hamiltonian. Once we find the best groundstate wavefunction for each Hamiltonian, we can deduce the magnetization predicted by that model. Hence, by comparing our results for the magnetization to known experimental results, we can identify the most suitable model.

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Date submitted: 24 Nov 2007 Electronic form version 1.4