Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Magnetic and charge correlations in the frustrated 2D Hubbard model[1] MATTHEW ENJALRAN, Department of Physics, Southern CT State University, 501 Crescent St., New Haven, CT 06515 — The high temperature superconductors have motivated numerous theoretical studies of strongly correlated many-body systems for over two decades. The richness of the phase diagram of these materials belies their relatively simple quasi-two-dimensional structure of stacked CuO_2 planes, where copper ions form a square lattice. With the experimental observation of several complex phases, including superconductivity, in quasi-two-dimensional triangular lattice materials (e.g., $Na_xCoO_2 \cdot yH_2O$ and κ-$(ET)_2X$) we now have material systems in which geometric frustration plays a prominent role. With this as our motivation, we investigate the 2D Hubbard model on a series of lattice geometries. We report preliminary results from mean-field calculations of the charge and magnetic properties of our model on frustrated and non-frustrated lattices. We also discuss the potential application of the constrained path quantum Monte Carlo (CPQMC) method to the study of frustrated 2D Fermi systems.

[1]Research supported by a Cottrell College Science Award, Research Corporation.

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Date submitted: 03 Dec 2007 Electronic form version 1.4