

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Metal-Insulator and Magnetic Transitions in Strongly Correlated and Disordered Systems** BYOUNGHAK LEE, Texas State University-San Marcos, NANDINI TRIVEDI, Ohio State University — We present a theoretical study for the effects of potential fluctuation on the spin and transport properties of correlated electron systems. Our study is based on the Fermion Hubbard model with on-site disorder. Our main results are: (1) The local potential fluctuation induces variations in the local carrier density and spin polarization, leading to the changes in collective optical and transport properties. (2) The Mott gap in the strongly correlated system closes with increasing disorder but leaves a distinctive pseudogap in the density of states. (3) The combined analysis of density of states, optical conductivity, and spin susceptibility reveals a phase diagram that features the Mott insulator to metal to Anderson insulator phase transition.

Byoungak Lee  
Texas State University-San Marcos

Date submitted: 19 Nov 2009

Electronic form version 1.4