Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Electronic Griffiths phase near a disordered Mott transition in $D = 2$ ERIC ANDRADE, Florida State University and Univ. of Campinas , EDUARDO MIRANDA, Univ. of Campinas , VLAD DOBROSAVLJEVIC, Florida State University — We investigate the effects of weak and moderate disorder on the $T = 0$ Mott Metal-Insulator Transition (MIT) in two dimensions, by solving the disordered Hubbard Model within the so-called Statistical Dynamical Mean Field Theory (statDMFT) [1]. In the weak disorder regime, we recover the results of the standard DMFT limit [2], including strong disorder screened close to the MIT. For moderate disorder, the screening of the disorder remains strong, but is reduced by fluctuation effects absent in high dimensions. For disorder strength W smaller then the on-site interaction U, the transition retains the Mott character, where the local quasiparticles weights Z_i vanish on all sites at the transition, indicating the transmutation of all electron into local magnetic moments. In contrast to the behavior in high dimensions [2], the corresponding distribution function $P(Z)$ is found to assume a singular form as the transition is approached, indicating the emergence of an electronic Griffiths phase [3] preceding the MIT.
[1] V. Dobrosavljevic and G. Kotliar, Phys. Rev. Lett. 78, 3943 (1997).
[2] D. Tanaskovic et al, Phys. Rev. Lett. 91, 066603 (2003).
[3] E. Miranda and V. Dobrosavljevic, Phys. Rev. Lett. 86, 264 (2001).

Eric Andrade
Florida State University and Univ. of Campinas

Date submitted: 27 Nov 2007 Electronic form version 1.4