Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Quantum Dynamics of Population-Imbalanced Fermi Mixture in One-dimensional Optical Lattices[1] BIN WANG, Department of Physics and Astronomy, University of Pittsburgh, ERHAI ZHAO, Department of Physics and Astronomy, George Mason University, W. VINCENT LIU, Department of Physics and Astronomy, University of Pittsburgh — We study the (pseudo-)spin dynamics of two-component Fermi mixture with population imbalance in one-dimensional (1D) optical lattices within the framework of 1D Hubbard model, utilizing the time-evolving block decimation (TEBD) algorithm. We consider the situation in which the center region of the system is initially fully occupied and the left-over fully polarized fermions are initially localized on the wings. It is found that for strong interaction the (pseudo-)spin polarization diffuses throughout the system qualitatively in the same way as the diffusion of non-interacting particles in 1D optical lattices. We further look into the time evolution of correlation functions such as pairing correlation and single particle green functions. According to our simulations, the partially polarized inhomogeneous Fermi gas appears to show no tendency of dynamically developing into a FFLO-type of state, contrary to what might have been expected.

[1]We acknowledge the support from DARPA OLE.

Bin Wang
Department of Physics and Astronomy, University of Pittsburgh

Date submitted: 11 Nov 2011 Electronic form version 1.4