Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Magnetizm Localization and Hole Localization in Fermionic Atoms Loaded on Optical Lattice MASAHIKO OKUMURA[1], SUSUMU YAMADA[2], CCSE, Japan Atomic Energy Agency, NOBUHIKO TANIGUCHI, Institute of Physics, University of Tsukuba, MASAHIKO MACHIDA[3], CCSE, Japan Atomic Energy Agency — In order to study an interplay of disorder, correlation, and spin imbalance on antiferromagnetism, we systematically explore the ground state of one-dimensional spin-imbalanced Fermionic atoms loaded on an optical lattice by using the density-matrix renormalization group method [1]. We find that disorders localize the antiferromagnetic spin density wave induced by imbalanced fermions and the increase of the disorder magnitude shrinks the areas of the localized antiferromagnetized regions. Moreover, the antiferromagnetism finally disappears above a large disorder. We also study hole doped cases [2]. Concentrating on the doped-hole density profile, we find in a large U/tregime that the clean system exhibits a simple fluid-like behavior whereas finite disorders create locally Mott regions which expand their area with increasing the disorder strength contrary to the conventional sense. References [1] M. Okumura, S. Yamada, N. Taniguchi, and M. Machida, arXiv:0810:3953. [2] M. Okumura, S. Yamada, N. Taniguchi, and M. Machida, Phys. Rev. Lett. **101** 016407 (2008).

[1]CREST(JST)
[2]CREST(JST)
[3]CREST(JST)

Masahiko Okumura
CCSE, Japan Atomic Energy Agency

Date submitted: 21 Nov 2008 Electronic form version 1.4