Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Phase separation in a mixture of two species of fermionic atoms in one-dimensional optical lattice[1] SHI-JIAN GU, RUI FAN, HAI-QING LIN, The Department of Physics, The Chinese University of Hong Kong — In this work, we study the ground-state phase diagram of a mixture of two species of fermionic atoms in one-dimensional optical lattice, as described by an asymmetric Hubbard model. We investigate the quantum phase transition from density wave to phase separation by studying both the corresponding charge order parameter and quantum entanglement, and present phase diagram as function of band-filling. A rigorous prove, that even for the case of a single hole doping, the density wave is unstable to the phase separation in the infinite U limit, will be presented. We also discuss experimental feasibility of observing such a phase separation.

[1]This work is partly supported by HKRGC CUHK-401504.

Shi-Jian Gu
The Department of Physics, The Chinese University of Hong Kong

Date submitted: 19 Oct 2006 Electronic form version 1.4