

凝縮系物理学ゼミナール

Condensed Matter Seminar

Location: Room 413, School of Science Bldg. 5 (理学 5 号館 413 号室)

Date: 14:15-15:00, Wednesday, 12 October 2011

“Quantum many-body effects on one-dimensional fermion cluster dynamics”

Speaker: **Mr. Jun'ichi Ozaki** (Condensed Matter Theory Group)

Abstract:

Recently, many experiments with cold atomic gases have been conducted from interest in the non-equilibrium dynamics of correlated quantum systems. Of these experiments, the mixing dynamics of fermion clusters [1] motivates us to research cluster dynamics in one-dimensional Fermi systems.

In this talk, we show two results of one-dimensional fermion cluster dynamics. One is fast collisions of two fermion clusters [2], and the other is slow forced transmitting of two fermion clusters. We adopt the one-dimensional Fermi-Hubbard model and apply the time-dependent density matrix renormalization group method. Next, we compare those results with results of quasi-classical picture, and show that particle transmittance is small estimated in quasi-classical calculation when interaction is strong.

References:

[1] A. Sommer, M. Ku, G. Roati and M.W. Zwierlein: Nature 472, 201 (2011).

[2] J. Ozaki, M. Tezuka and N. Kawakami: aiXiv:1107.0774 .