

# 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: 13:30-15:00, Wednesday, 6 June 2012

### One-dimensional Quantum Dynamical Simulator by Discrete Time Quantum Walk

Speaker: **Prof. Yutaka Shikano** (Institute for Molecular Science)

Abstract:

The discrete time quantum walk is defined as a quantum mechanical analogue of the random walk. This system can be taken as a toy model of the quantum transport system. Furthermore, in the artificial physical system, it can be experimentally implemented.

In this talk, while the discrete time quantum walk is the discrete step dynamics on the discrete lattice, we show that this can be mapped to the Dirac equation and the spatially discretized Shroedinger equation for the large step. The discrete time quantum walk can simulate the dynamics of the quantum system.

References:

K. Chisaki, N. Konno, E. Segawa, and Y. Shikano, Quant. Inf. Comp. **11**, 0741 (2011).