

KUDO, Kazue

ACADEMIC
PRODUCTION

Quantum
dynamics

Ochadai Academic Production

<http://www.cf.ocha.ac.jp/acpro/kudo/kazue/kudoE.html>

■ Researcher information

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Major

Statistical Physics, Basic theories of condensed matter

■ Research topics

Control of quantum dynamics by periodic driving

Keywords

One-dimensional quantum system, Oscillating field, Quantum dynamics, Transport properties, Numerical simulations

Contents

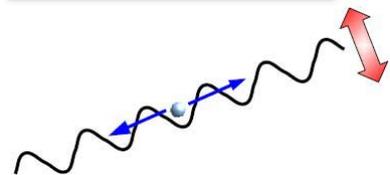
■ Overview

We are studying quantum dynamics in one-dimensional systems. The effective transport properties can be controlled by periodic driving instead of changing the original properties of the system. The aim of the research is to investigate theoretically the mechanism of the control. Numerical simulation of wavepacket dynamics is our main approach to the research.

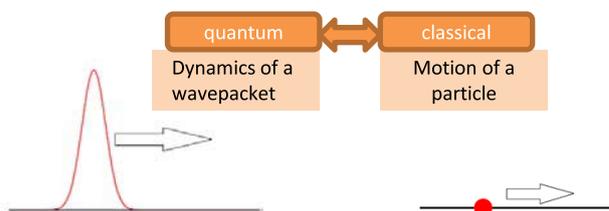
■ Process, case study

- Quantum-classical correspondence: quantum transport and classical phase space
- Splitting wavepackets: coherent control of wavepacket dynamics
- Super Bloch oscillations

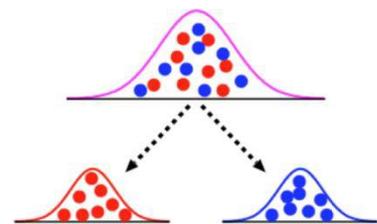
One-dimensional system driven by an oscillating field



Quantum-classical correspondence



Splitting wavepackets



Potential of social/industrial contribution

■ Joint research

Collaboration with an experiment group may promote the research about the control of transport properties of a potential device. We can make a contribution using numerical simulations.