



第25回トポロジカル物質科学セミナー Topological Materials Science Seminar (25)

Topological properties of interacting quantum systems with quasiperiodic modulation

Dr. Masaki Tezuka

Department of Physics, Kyoto University

Place: Room 284B, Main Building, Tokyo Institute of Technology

Date: November 21 (Monday), 2016

Time: 13:30-14:30

Abstract:

Quasiperiodic quantum systems are realized in several ways in condensed matter physics, such as layered materials with lattice mismatch and ultracold gases trapped in bichromatic optical lattices. Here first I briefly review the status of theoretical and experimental studies of topological phenomena involving quasiperiodic quantum systems.

A quasiperiodic modulation on a low-dimensional lattice can work both as a controlled inhomogeneity and as a window to a higher dimension. In this talk I illustrate this viewpoint by presenting some of the results of our theoretical studies: The topological phase diagram of a quasiperiodically modulated Bose-Hubbard model [1], and the effect of quasiperiodic modulation on a model of the topological superconductor [2], focusing on the effect of interaction between particles. Finally, I would like to comment on our more recent projects.

References

[1] F. Matsuda, M. Tezuka and N. Kawakami, J. Phys. Soc. Jpn. **83**, 083707 (Letter) (2014).

[2] M. Tezuka and N. Kawakami, Phys. Rev. B **85**, 031602 (R) (2012); Phys. Rev. B **88**, 155428 (2013).

※本セミナーは東京工業大学「量子物理学・ナノサイエンスセミナー」と共催で行います。