

凝縮系物理学ゼミナール

Condensed Matter Seminar

Location: **Room 115**, School of Science Bldg. 5 (理学 5 号館 115 号室)

Date: **13:30-15:00**, Tuesday, 5 November 2019

“Spectral bulk-boundary correspondence as polarization of chirality”

Speaker:

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Abstract:

Surface physics dominated by bulk properties is attracting much attention. For example, bulk-boundary correspondence predicts topological surface states. Another important context where surface properties are determined by the bulk is the electric polarization: surface electric charge is the bulk property modulo a quantum [1]. This fact might be regarded as a kind of BBC, in the sense that physical quantity apparently sensitive to the surface properties is determined by the bulk. It is an interesting question whether other physical quantities satisfy this “BBC”.

Recently, Tamura et al. proposed by numerics that surface accumulation of odd-frequency Cooper pair is the bulk property[2]. They named this relation as spectral bulk-boundary correspondence (SBBC). However, formal proof and physical explanation for SBBC has been lacking.

In this work, we prove SBBC based on the analogy with electric polarization: SBBC can be regarded as polarization of chirality. We discuss the similarities and differences between electric and chirality polarizations.

References:

- [1] D. Vanderbilt and R. D. King-Smith, Phys. Rev. B 48, 4442 (1993).
- [2] S. Tamura, S. Hoshino, and Y. Tanaka, arXiv:1809.05687.