



量子物理学・ナノサイエンス第 265 回セミナー

Anatomy of one-dimensional bulk-edge correspondence

講師 : 中田 陽介 氏

The University of Tokyo

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場所 : 本館 1 階 156 物理学系輪講室

概 要

In one-dimensional crystals, the Zak phase is quantized under chiral or inversion symmetry. However, several symmetries simultaneously degenerate in typical models of topological systems such as Su-Schrieffer-Heeger model, and it is very difficult to state what is the most fundamental requirement for the one-dimensional bulk-edge correspondence. To understand the essence of the bulk-edge correspondence, we need to deconstruct the conditions.

In the first part of the talk, we discuss the Zak-phase quantization in magnonic crystals. We theoretically show that magnonic crystals with neither chiral nor inversion symmetry can have a quantized Zak phase and topological magnons can appear at the boundary between two regions with different quantized numbers. In the second part of the talk, we introduce another mechanism based on Thouless pumping to realize topological edge states. Compared to the conventional scenario, the mechanism does not involve any symmetry protection. This mechanism is experimentally demonstrated for microwave photonic crystals.

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連絡教員 物理学系 村上 修一 (内線 2747)