第 101 回トポロジカル物質科学セミナー
Topological Materials Science Seminar (101)

Coulomb blockade of a nearly-open Majorana island

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Date: July 16 (Tue), 2019

Time: 10:30-12:00

Place: Room274, Faculty of Engineering Bldg. #3, Higashiyama Campus, Nagoya Univ. (名大東山キャンパス工学部3 号館274 号室)

Abstract:
We elucidate the nature of the suppression of Coulomb blockade in a nearly-open system made of topological superconductors. Topological superconductors are characterized by a finite gap in the energy spectrum, coexisting with a nontrivial degeneracy of the ground state, which causes the periodicity in the induced charge to be e and not 2e. This difference in the states and spectra from both conventional superconductors and normal metals results in a different underlying physics of the disappearance of Coulomb blockade oscillations at perfect transmission. We show that it is related to the physics of diabatic transitions between a discrete state and a continuum of itinerant states. We formulate a quantitative theory valid for the crossover from a regime where the amplitude of Coulomb blockade oscillations is proportional to the reflection amplitude, to a regime where the physics is similar to a conventional Cooper-pair box in the transmon regime.

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