



筑波大学

University of Tsukuba

Condensed Matter Seminar 物性論セミナー

2024年10月8日 (火), Oct 8 (Tue), 2024, 15:00-16:00

自然系学系棟D棟3階: 301号室 (Institutes of Natural Sciences Bldg. D 301)

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On Observer-Dependent Description of Quantum State on Identical Particles

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The setup of the Einstein-Podolsky-Rosen (EPR) paradox, which is the most profound problem in quantum mechanics, leads to an observer-dependent description of the quantum state from a quantum information perspective. While this problem is originally based on a single-particle system, it can be extended to systems with many identical particles. We propose an experimental approach to clarify the quantum state description for identical particles, utilizing the three-particle Aharonov-Bohm effect [A. Noguchi, YS, K. Toyoda, and S. Urabe, Nat. Comm. 5, 3868 (2014)]. In this seminar, we review the EPR paradox from a quantum information viewpoint and point out the discrepancy between the two parties problem and two particles problem. Finally, we provide the different quantum-state description with and without knowing the situation.

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