



Condensed Matter Seminar

筑波大学物性セミナー

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Nonlocality in ontological models of quantum theory

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Nonlocality is a fundamental characteristic of quantum theory, which was shown by Bell with his famous inequality. As is well known, the weirdness of the nonlocal feature was first pointed out in the EPR paper in the early days of quantum theory. However, it is not well known that Einstein also developed a beautiful argument that relates the nonlocal character of entangled states and the ontological status of quantum states in his unpublished work; Nonlocality is directly linked to the question of whether quantum states correspond to physical realities or not. Recent advances in quantum information theory and quantum foundations made it possible to take a fresh look at this fundamental problem and revealed an intimate connection between nonlocality and the ontological nature of quantum states. In this talk, I will introduce the direct proof of nonlocality without Bell inequalities and generalise it to multipartite entangled states.

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