Quantum Information Science Talks

UNIVERSITÄT DES SAARLANDES

Montag
03.02.25
12:00 Uhr, Raum 0.01,
Geb. E2 1
Alle Interessierten
sind herzlich willkommen

Prof. Dr. Dagmar Bruss
Heinrich-Heine-Universität Düsseldorf

Does quantum mechanics need complex numbers?

Monday, February 3rd, 2025 at 12:00p.m.
Building E2 1, Room 0.01

Quantum mechanical experimental predictions and outcomes of measurements are real-valued, while the abstract quantum mechanical formalism typically relies on using complex numbers. Historically, there have been several suggestions in the literature to reformulate quantum mechanics in a (higher-dimensional) real Hilbert space. Recently, however, claims about the necessity of complex numbers in the context of multipartite Bell-type experiments, and an experimental demonstration thereof, have been put forward. We revisit this question, with particular emphasis on a valid description of the tensor product of complex-valued quantum states in a real composite Hilbert space.

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