

Pseudoentanglement

Friday 26 July 2024 14:10 (15 minutes)

In this talk we will discuss to what extent entanglement is a “feelable” (or efficiently observable) quantity of quantum systems. Inspired by recent work of Gheorghiu and Hoban, we define a new notion which we call “pseudoentanglement”, which are ensembles of efficiently constructible quantum states which hide their entanglement entropy. We show such states exist in the strongest form possible while simultaneously being pseudorandom states. Consequently, we prove that there is no efficient algorithm for measuring the entanglement of an unknown quantum state, under standard cryptographic assumptions. We will talk about applications of this construction to diverse areas of physics and computer science.

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