

Title:

Bipartite Post-Quantum Steering and the Instrumental Scenario

Abstract:

In a traditional bipartite steering experiment, the assemblages (ensembles of ensembles) into which Alice remotely steers Bob's system may always be explained via quantum mechanics: this is a renowned result by Gisin, Hughston, Jozsa and Wootters. Here we show that steering that is not compatible with quantum theory may still arise in bipartite scenarios for a suitable relaxation of the experimental setup. These setups comprise experiments (i) where Bob can in some way intervene on their share of the system, and (ii) where the causal relations between the parties corresponds to the so-called instrumental scenario. We finally show that post-quantum steering in these scenarios does not necessarily follow from post-quantum correlations in the fully device-independent sense, rendering the phenomenon a genuinely semi-device-independent effect.