

Is quantum theory exact? The endeavor for the theory beyond standard quantum mechanics

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A tripartite quantum state violating the hidden influence constraints

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The talk will explore the possibility to explain quantum correlations via (possibly) unknown causal influences propagating gradually and continuously at a finite speed $v > c$. This framework goes beyond quantum theory in the sense that it tries to provide an explanation for Bell inequality violating correlations that remains local and continuous in space and time. In previous work it could be shown that the assumption of superluminal yet finite-speed influences carrying information about the measurements performed in combination with shared randomness leads to correlations that can be exploited for superluminal communication. This was achieved studying the set of possible correlations that are allowed within such a model and comparing them to correlations produced by local measurements on a four-party entangled quantum state. This talk will report on a quantum state that allows for the same conclusion involving only three parties.

It is based on work presented in Phys. Rev. A 88, 022123 (2013).

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