

Stochastic Einstein Locality Revisited

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Abstract

I discuss various formulations of stochastic Einstein locality (SEL), which is a version of the idea of relativistic causality, i.e. the idea that influences propagate at most as fast as light. SEL is similar to Reichenbach's Principle of the Common Cause (PCC), and Bell's Local Causality.

My main aim is to discuss formulations of SEL for a fixed background spacetime. I previously argued that SEL is violated by the outcome dependence shown by Bell correlations, both in quantum mechanics and in quantum field theory. Here I re-assess those verdicts in the light of some recent literature which argues that outcome dependence does not violate the PCC. I argue that the verdicts about SEL still stand.

Finally, I briefly discuss how to formulate relativistic causality if there is no fixed background spacetime.

Keywords: quantum non-locality, stochastic Einstein locality, principle of the common cause, common common causes

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