Relativistic Quantum Mechanics through Frame-Dependent Constructions

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Abstract

This paper is concerned with the possibility and nature of relativistic hidden-variable formulations of quantum mechanics. Both ad hoc teleological constructions of spacetime maps and frame-dependent constructions of spacetime maps are considered. While frame-dependent constructions are clearly preferable, they provide neither mechanical nor causal explanations for local quantum events. Rather, the hidden-variable dynamics used in such constructions is just a rule that helps to characterize the set of all possible spacetime maps. But while having neither mechanical nor causal explanations of the values of quantum-mechanical measurement records is a significant cost, it may simply prove too much to ask for such explanations in relativistic quantum mechanics.

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