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Stochastic Mechanics Applied to Relativistic Fields

After a brief review of stochastic mechanics, we apply the theory to relativistic fields. There are two motivations for doing this. First, stochastic mechanics of nonrelativistic particle systems led to an unphysical instantaneous signaling between dynamically uncoupled but correlated systems, due to the fact that the Markov process of the theory lives on multidimensional configuration space. But fields live on spacetime, and the hope is that nonlocality features may be avoided. The second motivation is the hope that the theory may provide useful technical tools in constructive quantum field theory.

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