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Title: "Perturbative Quantum Field Theory with Homotopy Algebras"

Abstract:

The Batalin-Vilkovisky formalism builds a bridge between perturbative quantum field theory and homotopical algebra. In particular, the formulas of the homological perturbation lemma are equivalent to the Feynman diagram expansion of physicists. This insight allows us to apply powerful tools from homotopical algebra to describe phenomena in perturbative quantum field theory, and I will discuss some of them, focusing on T-duality and color-kinematics duality. This homotopy algebraic perspective on quantum field theory also provides a route to the subject that is particularly accessible for mathematicians.