

On the Global Well-Posedness of the Stochastic Yang-Mills-Higgs Equations in Two Dimensions

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Abstract

The Yang-Mills-Higgs (YMH) model plays a central role in several areas of mathematics, including analysis, geometry, and probability theory. In this talk, we implement the stochastic quantization procedure for the YMH model in two dimensions. That is, we construct the two-dimensional YMH measure by proving global well-posedness and uniform-in-time bounds for the two-dimensional stochastic YMH equations. As part of our proof, we first discuss covariant stochastic objects and a covariant para-controlled Ansatz. Then, we discuss a decay mechanism for the stochastic YMH equations near unstable Yang-Mills connections. This is joint work with S. Cao, M. Hairer, and W. Zhao.