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Contour Deformations for Lattice Field Theory

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Highly oscillatory path integrals are common in lattice field theory. They crop up as sign problems and as signal to noise problems and prevent Monte Carlo calculations of both lattice QCD at finite chemical potential and real-time dynamics. A general method for treating highly oscillatory path integrals has emerged in which the domain of integration of the path integral is deformed into a complexified field space. In this talk I will review this method, and I will discuss recent progress in machine learning manifolds for lattice QCD.

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