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Neural Network Field Transformation and Its Application in HMC

Thursday, 29 July 2021 13:45 (15 minutes)

We propose a continuous differentiable and invertible gauge field transformation parametrized with neural networks. We apply this technique to 2D U(1) pure gauge system, combine the transformation and HMC, and train the neural network field transformation for improved tunneling of topological sectors during the gauge generation. We present the properties of the trained transformation applied to the gauge fields with different gauge couplings and lattice volumes, and discuss the cost and benefit of this algorithm in tackling the critical slowing down of generating independent gauge configurations toward the continuum limit.

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Session Classification: Algorithms (including Machine Learning, Quantum Computing, Tensor Networks)

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