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Exploration of parallel tempering to reduce topological freezing

Thursday 4 December 2025 14:00 (40 minutes)

In Lattice QCD, the problem of topological freezing refers to the increasingly long autocorrelation times of topological observables as the continuum limit is approached. In this talk, we present an analysis of a method known to mitigate this: *parallel tempering on boundary conditions*. This algorithm consists of simultaneously generating several Markov chains or "replicas", each of these differing only by some condition on a subset of links of the lattice, and proposing an exchange between pairs of replicas through an accept/reject step. Based on this analysis, we also discuss under which conditions could this algorithm present a computational advantage on $SU(3)$ pure-gauge theory calculations.

Special requests

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