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Theta dependence of the deconfining temperature in SU(3) Yang-Mills theory via imaginary theta simulations

Tuesday 4 November 2025 18:00 (1h 30m)

We study the theta dependence of the deconfining temperature in SU(3) Yang-Mills theory. Simulation at real theta causes the sign problem, while simulations at imaginary theta are feasible but suffer from topological freezing that becomes severe at large imaginary theta. We mitigate the topological freezing using two-dimensional parallel tempering technique with replica exchanges across simulation parameters. We found that the technique substantially lowers topological-charge autocorrelations and mitigates freezing. In addition, to eliminate the ultraviolet noise, we use the stout smearing method in the update of the gauge fields. We measure the theta dependence of the deconfining temperature in the imaginary theta region, and estimate it in the real theta region by analytic continuation.

Parallel Session (for talks only)

Vacuum structure and confinement

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