



Beyond Nambu-Goto corrections for the Effective String Theory of $SU(N)$ lattice gauge theories

Monday, 29 July 2024 11:35 (20 minutes)

We study the Effective String Theory corrections beyond the Nambu-Goto action in $SU(N)$ lattice gauge theories in $2 + 1$ dimensions, for $N = 3$ and $N = 6$. We extract these corrections from a set of high-precision Monte Carlo simulations of Polyakov loop correlators at finite temperatures close to the deconfinement transition. We also report an estimate for the $SU(2)$ theory obtained from a reanalysis of published data. We show that these corrections are in general very small, they increase with N and are always compatible with the bounds derived from the S-matrix Bootstrap analysis. Moreover, since in $2+1$ dimensions the deconfinement transition of the $N = 3$ theory is of second order, our results allow for a non-trivial test of the Svetitsky-Yaffe conjecture which, in the neighbourhood of the critical point, maps the $2+1$ dimensional $SU(3)$ gauge theory into the two dimensional three-state Potts model. In particular we show that our results for the correlator of Polyakov loops perfectly agree with an expression for the short distance spin-spin correlator in the Potts model obtained using a conformal perturbation approach.

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Session Classification: Vacuum structure and confinement

Track Classification: Vacuum Structure and Confinement