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

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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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