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On the rigid string contribution to the interquark potential

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One of the most interesting recent results on the effective string description of Lattice Gauge Theories is the universality of the first few terms of the effective action. This is a direct consequence of the Lorentz invariance of the underlying LGTs and makes this theory much more predictive than usual effective models in particle physics.
Besides the well known Nambu-Goto action, one of the combinations allowed by Lorentz symmetry is the so called "rigid string" proposed more that 30 years ago by Kleinert and Polyakov as a candidate to explain confinement in the framework of the dual superconductor scenario.
In this talk we discuss a few non trivial properties of this string and evaluate, using the zeta function regularization, the corrections to the interquark potential induced by the extrinsic curvature term contained in the action.
We then compare our predictions with a set of high precision simulations of the 3d U(1) LGT and show that the large β behavior of the interquark potential is described very well by the rigid string. More precisely we observe, as β increases, a smooth cross-over from the usual Nambu-Goto behavior to a rigid string behavior which dominates in the continuum limit.
We finally discuss the implications of our results for SU(N) LGTs both in $d = 3$ and in $d = 4$.

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