

The Gluon Propagator in Lattice Landau Gauge with twisted boundary conditions

Presenter: Torsten Tok

Torsten Tok, Lorenz von Smekal, Kurt Langfeld and Hugo Reinhardt

Abstract: We investigate the infrared behaviour of the gluon propagator in Landau gauge on a lattice with twisted boundary conditions. Analytic calculations using Dyson-Schwinger equations, exact renormalization group and stochastic quantization show that the Landau gauge gluon propagator approaches zero for small momentum. On the other hand lattice calculations seem to indicate a non-zero infrared limit. One possible explanation for this difference is the existence of zero-momentum fluctuation modes which potentially give rise to a massive contribution to the gluon propagator. Our simulations show that with twisted boundary conditions these zero-momentum modes are suppressed and the gluon propagator is reduced in the infrared compared to a periodic lattice ensemble.