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Complex poles and spectral functions of Landau gauge QCD and QCD-like theories

Thursday, 5 December 2019 15:00 (3 hours)

We investigate the analytic structures of the gluon and quark propagators of an effective model of the Landau gauge QCD and QCD with many quark flavors, which can be obtained by adding effective mass terms to the standard Faddeev-Popov Lagrangian. We derive general relationships between the number of complex poles and the sign of the spectral function under some assumptions on the asymptotic behaviors of the propagator. Based on this relation, in particular, we find a transition of the number of complex poles of the gluon propagator, depending on the number of quark flavors and their mass. We furthermore discuss the formal aspects of complex poles.

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