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Chromo-electric screening length in 2+1 flavor QCD

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Chromo-electric screening at high temperature is encoded in the large distance behavior of Polyakov loop correlators. In $SU(N)$ gauge theory (quenched QCD) the large distance behavior of the Polyakov loop correlators has been studied and the corresponding chromo-electric screening length has been determined. In QCD with light dynamical quarks this turned out to be very difficult because of the large Monte-Carlo noise. We study the long distance behavior of the correlator of the real and imaginary part of the Polyakov loop in 2+1 flavor QCD with nearly physical quark masses using HISQ action and lattices with temporal extent $N_t = 6, 8, 10$ and 12. To reduce the noise we apply several levels of HYP smearing to the Polyakov loops and determine the corresponding chromo-electric screening masses. We compare our results to the weak coupling calculations at high temperatures.

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