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Gluon propagator in two-color dense QCD: Massive Yang-Mills approach at one-loop

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Motivated by the recent lattice result, we study the Landau gauge gluon propagators in dense two-color QCD at quark chemical potential. In order to take into account the non-perturbative effects in the infrared regime, we use the massive Yang-Mills theory which has successfully described the gluon and ghost propagators in the Landau gauge within the one-loop approximation. We couple quarks to this theory and compute the one-loop polarization effects. Dense matter in two-color QCD should possess the diquark condensate which is color-singlet, and hence neither electric nor magnetic screening effects appear at the scale less than the diquark gap. This infrared behavior explains the lattice results which show the insensitivity of screening masses to the quark density.

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