

Remarks on the quark-gluon vertex

Abstract

The infrared enhancement of the constituent quark mass can be studied through the quark propagator using Schwinger-Dyson equations (SDEs). In this formalism, the mass function obtains a value of about 300-500 MeV in the infrared regime, whereas its perturbative limit is well reproduced in the ultraviolet domain. Lattice studies have provided confirmation of this non-perturbative phenomenon. The quark propagator is intimately linked with the gluon propagator and the quark-gluon vertex through the relevant SDEs as well as the symmetry relations of quantum chromodynamics (QCD). Therefore, the behavior of both gluon propagator and quark-gluon vertex impact on the quark propagator and the dynamical mass generation. In this work, we carry out a numerical analysis of the one loop result for all the form factors of the quark-gluon vertex in various kinematical regimes of momenta involved.

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