

The transversely projected three-gluon vertex and its planar degeneracy

We analyze in detail the key features of the transversely-projected three-gluon vertex based on the corresponding Schwinger-Dyson equation. In particular, we aim to scrutinize the property denominated “planar degeneracy” recently established by lattice simulations. This property states that the vertex is well approximated by a single Bose-symmetric variable, which defines a plane in momentum space. Our analysis indicates that this property is particularly accurate for the form factor associated with the classical tensor structure in general kinematics, while deviations are observed for the remaining three form factors. Furthermore, we demonstrate that the classical form factor has a clear numerical dominance over the other three. The outcome is the emergence of a very compact description for the three-gluon vertex in general kinematics, which may simplify significantly nonperturbative applications involving this vertex.

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