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A progress on formulating Bethe-Salpeter kernels

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Collaboration

Abstract content

We study mesons through solving the coupled system of the gap equation for the quark propagator and the Bethe-Salpeter equation for the meson wavefunction. The gap equation and Bethe-Salpeter equation are in fact members of infinitely coupled Dyson-Schwinger equations of Green functions of QCD. To make it solvable, the system must be truncated. The simplest rainbow-ladder truncation is widely used but shows drawbacks in many aspects. To improve the simplest truncation, we analyze symmetries of the fundamental theory and solve the corresponding Ward-Green-Takahashi identities. Then, the elements of the coupled system, i.e., the quark-gluon vertex and the quark-antiquark scattering kernel, can be constructed accordingly.

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