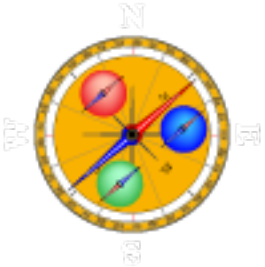

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Light-cone distributions from the Bethe Salpeter Eq. in Minkowski-space

Friday, 15 December 2017 11:05 (25 minutes)

The structure of a pseudo-scalar fermion-antifermion bound state is i nvestigated through the solution of the Bethe-Salpeter equation in Minkowski space. The kernel is truncated to the ladder approximation, a form factor is introduced in the vertex, with the exchanged particle being a massive, scalar, pseudo-scalar or a vector boson. The method used for the numerical solution of the four-dimensional integral equation is the Nakanishi integral representation of each component of the Bethe-Salpeter amplitude decomposed in the spinor space, where the weight function is free of singularities that plagues the Bethe-Salpeter equation inMinkowski space. The projection of the normalized Bethe-Salpeter amplitude on the null-plane allows to extract the valence component of the light-front wave function, and from that the valence probability, the transverse and longitudinal momentum distributions. A simple model for the pion is tuned to have a strongly bound quark-antiquark state, with parameters adapted to represent an effective massive gluon in the Feynman gauge, with a form factor for the quark-gluon vertex and constituent quark masses. We briefly discuss how to include physics beyond the valence component in the light-cone distributions, like e.g. the T-odd distribution, and also considering the formulation of observables starting from the Bethe-Salpeter amplitude.

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