

The bound state formation in Minkowski space: A study about the effect of dressing the quark propagator

This work analyzes the effect of dressing the quark propagator in the bound state formation in Minkowski space. Through the Bethe-Salpeter approach, a 0- fermion-antifermion bound state is studied. The considered system is characterized by two quarks interacting through a vector boson exchange in the ladder approximation. Especially, the dressed quark propagators with a phenomenological running mass function fit to Lattice QCD calculations. The developed model contains three gluonic scales: the effective gluon mass $\sim \Lambda_{\text{QCD}}$, the size of the extended quark-gluon vertex $\sim 2\text{fm}$, and the dressing of the quark propagator. Static and dynamical quantities that characterize the bound state are calculated and the effects of those scales in the dynamics of the bound system are discussed. In particular, the light-front amplitudes and the longitudinal and transverse valence momentum distributions are analyzed for two bound state masses, $M = 653 \text{ MeV}$ and $M = 447 \text{ MeV}$, with or without dressing effects.

Author: Dr CASTRO, Abigail (ITA)

Orateur: Dr CASTRO, Abigail (ITA)