

Integral representation and Minkowski space bound state problems

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The bound state Bethe-Salpeter amplitude described by a Nakanishi two-dimensional integral representation has a smooth weight function g , which carries the detailed dynamical information. The Light-front wave function can be derived and is given by a one-dimensional, integral representation with the same weight function g . By using the generalized Stieltjes transform, g can be written in terms of the Light-Front wave function in the complex plane of its arguments. Also a new integral equation for g is derived for a bound state case. We found a prescription for obtaining the kernel N starting with the kernel K of the Bethe-Salpeter equation, and the method is valid for any kernel given by an irreducible Feynman amplitude. We briefly discuss a possible application in hadronic physics, where from the Light-front wave function one obtains the Nakanishi weight function and the associated Bethe-Salpeter amplitude.

Summary

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