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Bound states in Minkowski space in 2+1 dimensions

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The Nakanishi perturbative integral representation of the Bethe-Salpeter amplitude in three-dimensions (2+1) is investigated in order to derive a workable framework for bound states, which is solution of the homogeneous Bethe-Salpeter Equation (BSE) in Minkowski space. The projection onto the null-plane of the three-dimensional homogeneous BSE is used to derive an equation for the Nakanishi weight function for bound states. In this work, the formal development is illustrated in detail and applied to the bound system composed by two massive scalars interacting through the exchange of a massive scalar. The explicit forms of the integral equations are also obtained in ladder approximation.

Authors: Mr GUTIERREZ, Cristian (Universidade Estadual Paulista Julio de Mesquita Filho, Instituto de Fisica Teorica , 01156-970, SP, Brasil.); Dr FREDERICO, Tobias (Instituto Tecnologico de Aeronautica 12228-900, Sao Jose dos Campos, SP, Brasil); Mr GIGANTE, Vitor (Instituto Tecnologico de Aeronautica 12228-900, Sao Jose dos Campos, SP, Brasil)

Co-author: Dr TOMIO, Lauro (Universidade Estadual Paulista Julio de Mesquita Filho, Instituto de Fisica Teorica , 01156-970, SP, Brasil.)

Presenter: Mr GUTIERREZ, Cristian (Universidade Estadual Paulista Julio de Mesquita Filho, Instituto de Fisica Teorica , 01156-970, SP, Brasil.)

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