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Left-hand cut and the HAL QCD method

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In this talk, we discuss an issue related to the left-hand cut in the scattering amplitude, which has been recently pointed out to be relevant for an analysis on the nature of the tetra quark state T_{cc} .

We first discuss a relation between the left-hand cut from the Yukawa potential in non-relativistic quantum field theory and t -channel cut in the S-matrix for a relativistic quantum field theory.

We then demonstrate how the issue appears in the infinite volume limit from finite volume simulations.

We finally discuss how we treat the left-hand cut in the HAL QCD potential method.

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