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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 filed 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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