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## The Lüscher scattering formalism on the left-hand cut: an update

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The Lüscher scattering formalism is a popular method which allows the extraction of two-to-two scattering amplitudes from the finite-volume spectrum. Recent lattice calculations have highlighted the limitations of the formalism in systems in which a lighter particle can be exchanged between the two scatterers (e.g.  $NN$  or  $DD^*$  scattering). This leads to the presence of a left-hand cut just below the two-particle threshold in the partial-wave-projected amplitudes, on which the sub-threshold analytic continuation of the standard method breaks down. In this talk, we review our proposed extension of the formalism to the left-hand cut and give an update on formal developments, including the extension to non-identical scatterers (applicable to  $DD^*$  and similar processes) and some limiting cases. We present also some developments in solving the integral equations used to retrieve scattering amplitudes from intermediary  $K$ -matrices, making contact with the three-particle RFT formalism.

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