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Two-particle matrix elements in a box

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Resonant hadrons, and some loosely bound states, can be studied by looking at the energy dependence of the reaction rate of the multi-particle asymptotic states associated to them. For instance, the form factors of these states can be found via analytic continuation of the two-particle transition rate induced by the current of interest. These transitions, in turn, can be constrained from finite volume spectra and matrix elements, which can be obtained from a lattice calculation. In this talk we will describe the procedure to connect finite volume data to infinite volume transitions, and apply it to a non-relativistic toy model lattice theory. This toy model features a bound state whose binding energy can be tuned from a state close to threshold to deeply bound. We find that the finite volume effect in matrix elements becomes more significant as the binding energy decreases. Finally, we show that these effects can be corrected with the framework describing the volume dependence of the nearby two-particle channel.

Parallel Session (for talks only)

Hadronic and nuclear spectrum and interactions

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