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Extracting hadron-hadron interaction from lattice QCD in a small box

In this talk, I will illustrate an alternative approach to Luscher's formula for extracting the hadron-hadron interaction from finite volume energy levels. The framework includes three ingredients, plane wave basis expansion, effective field theory (EFT) and eigenvector continuation. With the plane wave basis, we can include the partial wave mixing effect in the cubic box more naturally than the Luscher's formula. Using the EFT, the framework will benefit from the known long-range interaction (e.g. one-pion-exchange interaction) and can be used for small box simulations. The eigenvector continuation will accelerate the calculation and provide an easy-to-use interface to the lattice community.

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