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Retrieving the optical potential from a Lattice simulation.

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We propose a method for the direct extraction of the complex hadron-hadron optical potential (or, equivalently, the phase shift and inelasticity in a given channel) on the lattice, which does not require the use of the multi-channel Lüscher formalism, but the knowledge of a tower of energy levels only.

The approach works for any multi-particle states and tested explicitly on a set of synthetic data for the $\pi\eta - K\bar{K}$ system. Further, we show how a sufficiently large number of energy eigenvalues can be obtained utilizing partial twisting.

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