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Analytical dispersive parameterization for elastic scattering of spinless particles

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We present an improved parameterization of the elastic scattering of spin-0 particles, which is based on a dispersive
representation for the inverse scattering amplitude. Besides being based on well known general principles, the requirement that the
inverse amplitude should satisfy the dispersion relation significantly constrains its possible forms and have not been incorporated
in the existing parameterizations so far. While the right-hand cut of the inverse scattering amplitude is controlled by unitarity, the
contribution from the left-hand cut, which comes from the crossing symmetry, is commonly ignored or incorporated improperly.
The latter is parameterized using the expansion in a suitably constructed conformal variable, which accounts for its analytic structure. The correct implementations of the Adler zero and threshold factors for angular momentum $J > 0$ are discussed in detail as
well. The amplitudes are written in a compact analytic form and provide a useful tool to analyze current and future lattice data in
the elastic region improving upon the commonly used Breit-Wigner or K-matrix approaches.

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