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Partial wave analysis of pion production with fixed-t analyticity and finite energy sum rules

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Collaboration

Abstract content

I present partial wave analysis for pion photoproduction based on a dual representation: the high-energy Regge background is smoothly continued into the resonance region by means of an energy-dependent suppression factor, the resonances in the s-channel and Born contribution are added on top. This representation allows for a natural and economical way to incorporate the fixed-t analyticity. The lowest multipoles are unitarized using $\pi - N$ phases and inelasticities, and exact balance between the resonance parameters and the background is achieved by means of finite energy sum rules which ensure matching between the two. A crucial ingredient in this analysis is the use of saturated Regge trajectories that allow for a matching of the Regge asymptotics that is an essentially forward phenomenon, and wide-angle scattering regime that is governed by quark exchange and has a different scaling behavior.

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