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Accurate determinations of the rho and sigma poles through Padé Approximants

Based on the mathematically well defined Pade Theory, a theoretically safe new procedure for the extraction of the pole mass and width of a resonance is proposed. In particular, thanks to the Montessus de Ballore theorem we are able to unfold the Second Riemann Sheet of an amplitude to search for the position of the resonant pole in the complex plane (arXiv:1306.6308 [hep-ph]). The method is systematic and provides a model-independent treatment of the prediction and the corresponding errors of the approximation. When the Pade approximants are applied in combination with the Roy-like GKPY equations (arXiv:1102.2183 [hep-ph]) we are able to extract not only precise but actually accurate determinations of the rho and sigma poles, compatible and with errors of a similar size as in previous determinations.

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