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Data-driven dispersive analysis of the ππ and πK scattering

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We present a data-driven analysis of the resonant S-wave $\pi\pi\to\pi\pi$ and $\pi K\to\pi K$ reactions using the partial-wave dispersion relation. The contributions from the left-hand cuts are accounted for using the Taylor expansion in a suitably constructed conformal variable. The fits are performed to experimental and lattice data as well as Roy analyses. For the $\pi\pi$ scattering we present both a single- and coupled-channel analysis by including additionally the $K\bar{K}$ channel. For the latter the central result is the Omnès matrix, which is consistent with the most recent Roy and Roy-Steiner results on $\pi\pi\to\pi\pi$ and $\pi\pi\to K\bar{K}$, respectively. By the analytic continuation to the complex plane, we found poles associated with the lightest scalar resonances $\sigma/f_0(500)$, $f_0(980)$, and $\kappa/K^*_0(700)$ for the physical pion mass value and in the case of $\sigma/f_0(500)$, $\kappa/K^*_0(700)$ also for unphysical pion mass values.

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