

Investigations on Left Hand Cut Contribution to Determination of $\kappa(700)$ Pole

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Abstract: The uncertainties of background contributions to $J=0$ partial wave πK scattering phase shifts are carefully studied. We firstly point out that the circular cuts exhibit different characters in $S_{1/2}$ and $S_{3/2}$ waves. While the former contributes negatively to the scattering length parameter, the latter contributes positively, i.e., has a wrong sign. This fact indicates that short range force contributions to the phase shift are non-negligible in the exotic channel. Nevertheless, it is verified that the κ pole will be affected only slightly with respect to the theoretical uncertainty in estimating the left hand cut contributions.

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Key words: πK scattering, unitarity, dispersion relations, κ resonance

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