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Dispersive Analysis of ☒' –> ☒ π π Decays

Monday, 13 March 2017 17:00 (30 minutes)

The decay channel $\eta' \to \eta\pi\pi$ offers several features of interest: due to final-state interactions it can be used to constrain $\eta\pi$ scattering. It is also an essential input for a study of inelastic effects in the decay $\eta' \to 3\pi$. In the past, extensions of chiral perturbation theory have been employed to describe this decay.
In this talk, I will present a dispersive analysis of the decay amplitude that is based on the fundamental principles of analyticity and unitarity. In this framework the leading final-state interactions are fully taken into account. Our dispersive representation relies only on input for the $\pi\pi$ and $\eta\pi$ scattering phase shifts. Isospin symmetry allows us to describe both the charged and neutral decay channel in terms of the same function.
The dispersion relation contains three subtraction constants that cannot be fixed by unitarity. We determine these parameters by a fit to Dalitz-plot data from the VES and BES-III experiments and show that the result fulfills the prediction of a low-energy theorem.
We compare the dispersive fit to variants of chiral perturbation theory.

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