



Contribution ID: 19

Type: **Parallel-Goldstone Boson**

## Patterns of $C$ - and $CP$ -violation in hadronic $\eta$ and $\eta'$ three-body decays

We construct hadronic amplitudes for the three-body decays  $\eta^{(\prime)} \rightarrow \pi^+\pi^-\pi^0$  and  $\eta' \rightarrow \eta\pi^+\pi^-$  in a non-perturbative fashion, allowing for  $C$ - and  $CP$ -violating asymmetries in the  $\pi^+\pi^-$  distributions.

These amplitudes are consistent with the constraints of analyticity and unitarity. We find that the currently most accurate Dalitz-plot distributions taken by the KLOE-2 and BESIII collaborations confine the patterns of these asymmetries to a relative per mille and per cent level, respectively.

Our dispersive representation allows us to extract the individual coupling strengths of the  $C$ - and  $CP$ -violating contributions arising from effective isoscalar and isotensor operators in  $\eta^{(\prime)} \rightarrow \pi^+\pi^-\pi^0$  and an effective isovector operator in  $\eta' \rightarrow \eta\pi^+\pi^-$ , while the strongly different sensitivities to these operators can be understood from chiral power counting arguments.

**Primary author:** AKDAG, Hakan (Bonn University)

**Presenter:** AKDAG, Hakan (Bonn University)