

# A precise determination of the $K^*(1410)$ resonance parameters through $\tau^- \rightarrow K^-\eta^{(\prime)}\nu_\tau$ decays

## Abstract content

We have studied the  $\tau^- \rightarrow K^-\eta^{(\prime)}\nu_\tau$  decays within Chiral Perturbation Theory including resonances as explicit degrees of freedom. We have considered three different form factors according to treatment of final-state interactions. In increasing degree of soundness: Breit-Wigner, exponential resummation and dispersive representation. We find that although the first one fails in accounting for the data on the  $K\eta$  mode, the other two approaches provide good fits to them which are sensitive to the  $K^*(1410)$  pole parameters, that are determined to be  $M_{K^*\prime} = (1330^{+27} - 41) \text{ MeV}$  and  $\Gamma_{K^*\prime} = (217^{+68} - 122) \text{ MeV}$ . These values are competitive with the standard determination from  $K\pi$  decays. The corresponding predictions for the  $\tau^- \rightarrow K^-\eta^{(\prime)}\nu_\tau$  channel respect the current upper bound and hint to the discovery of this decay mode in the near future.

## Summary

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