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## Combined analysis of the decays $\tau^- \rightarrow K_S \pi^- \nu_\tau$ and $\tau^- \rightarrow K^- \eta \nu_\tau$

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In a combined study of the decay spectra of  $\tau^- \rightarrow K_S \pi^- \nu_\tau$  and  $\tau^- \rightarrow K^- \eta \nu_\tau$  decays within a dispersive representation of the required form factors, we illustrate how the  $K_*(1410)$  resonance parameters, defined through the pole position in the complex plane, can be extracted with improved precision as compared to previous studies. While we obtain a substantial improvement in the mass, the uncertainty in the width is only slightly reduced, with the findings  $M_{K_*'} = 1304 \pm 17 \text{ MeV}$  and  $\Gamma_{K_*'} = 171 \pm 62 \text{ MeV}$ . Further constraints on the width could result from updated analyses of the  $K\pi$  and/or  $K\eta$  spectra using the full Belle-I data sample. Prospects for Belle-II are also discussed. As the  $K-\pi^0$  vector form factor enters the description of the decay  $\tau^- \rightarrow K^- \eta \nu_\tau$ , we are in a position to investigate isospin violations in its parameters like the form factor slopes. In this respect also making available the spectrum of the transition  $\tau^- \rightarrow K^- \pi^0 \nu_\tau$  would be extremely useful, as it would allow to study those isospin violations with much higher precision.

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