

Beyond SM expectations from very rare Kaon decays

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Rare decays dominated by one-loop electroweak dynamics offer a very powerful tool to investigate the flavour structure of physics beyond the Standard Model (SM). Among them, the kaon rare decays $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ and $K_L \rightarrow \pi^0 \nu \bar{\nu}$ play a privileged role because of their strong suppression within the SM and the high-level of accuracy achieved in their theoretical description. Thanks to the theoretical control recently achieved over their long-distance components, the rare decays $K_L \rightarrow \pi^0 e^+ e^-$ and $K_L \rightarrow \pi^0 \mu^+ \mu^-$ also exhibit good sensitivities allowing, in particular to probe helicity-suppressed effects in a very clean way. We illustrate how precise measurements of rare kaon decays can be used to discriminate among different models of New Physics, both within and beyond the Minimal Flavour Violation framework.

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