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A new $K_S \rightarrow \pi e \nu$ branching fraction measurement from KLOE-2

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The KLOE-2 Collaboration continues the KLOE long-standing tradition of flavour physics precision measurements in the kaon sector with a new $K_S \rightarrow \pi e \nu$ branching fraction measurement.

Based on a sample of 300 million K_S mesons produced in $\phi \rightarrow K_L K_S$ decays recorded by the KLOE experiment

at the DAΦNE e^+e^- collider, the $K_S \rightarrow \pi e \nu$ signal selection exploits a boosted decision tree built with kinematic variables together with time-of-flight measurements.

A fit to the reconstructed electron mass distribution provides the signal yield, then normalised to $K_S \rightarrow \pi^+ \pi^-$ decays. Data control samples of $K_L \rightarrow \pi e \nu$ decays are used to evaluate signal selection efficiencies.

The combination with our previous $\text{BR}(K_S \rightarrow \pi e \nu)$ measurement, based on an independent data sample, allows the total precision to be improved by almost a factor of two, and a new derivation of $f_+(0)|V_{us}|$.

In-person participation

Yes

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