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Latest results on $K^+ \to \pi^+ \nu\bar{\nu}$ decay and precision measurements with Kaons at NA62

Tuesday, July 11, 2023 12:40 PM (20 minutes)

An overview of the latest results on $K^+ \to \pi^+ \nu\bar{\nu}$ decay and precision measurements at the NA62 experiment will be presented.
The NA62 experiment at CERN collected the world's largest dataset of charged kaon decays in 2016-2018, leading to the first measurement of the Branching Fraction of the ultra-rare $K^+ \to \pi^+ \nu\bar{\nu}$ decay, based on 20 candidates. This provides evidence for the very rare $K^+ \to \pi^+ \nu\bar{\nu}$ decay, observed with a significance of 3.4σ. This measurement is also used to set limits on BR($K^+ \to \pi^+ X$), where X is a scalar or pseudo-scalar particle. The analysis of the full 2016-2018 data sample and future NA62 plans and prospects are reviewed.

More recent results from NA62 analyses of $K^+ \to \pi^0 e^+ \nu\gamma$, $K^+ \to \pi^+ \mu^+ \mu^-$ and $K^+ \to \pi^+ \gamma\gamma$ decays, using data samples recorded in 2017–2018, are also reported. The radiative kaon decay $K^+ \to \pi^0 e^+ \nu\gamma$ (Ke3g) is studied with a data sample of O(100k) Ke3g candidates with sub-percent background contaminations. Preliminary results with the most precise measurements of the Ke3g branching ratios and T-asymmetry are presented. The $K^+ \to \pi^+ \mu^+ \mu^-$ sample comprises about 27k signal events with negligible background contamination, and the presented analysis results include the most precise determination of the branching ratio and the form factor. The $K^+ \to \pi^+ \gamma\gamma$ sample contains about 4k signal events with 10% background contamination, and the analysis improves the precision of the branching ratio measurement by a factor of 3 with respect to the previous measurements.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

NA62 experiment at CERN

Is the speaker for that presentation defined?

No

Details

The abstract is submitted on behalf of the NA62 Collaboration by A. Romano, chair of the NA62 Conference Committee. If it will be accepted as a talk, a speaker will be appointed as soon as possible.

Internet talk

Maybe

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