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Analysis of the rare $K^{+}\to e^{+}\nu\ \mu^{+}\mu^{-}$ decay at NA62

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The main goal of the NA62 experiment at CERN is to measure the probability of the ultra-rare $K^{+} \to \pi^{+}\nu\nu$ decay. The collected statistics for 2016-2018 years, allows us to analyze other rare decays, in particular, $K^{+}\to e^{+}\nu\ \mu^{+}\mu^{-}$. Since the inner bremsstrahlung (IB) for $K^{+}\to e^{+}\nu\ \mu^{+}\mu^{-}$ decay is suppressed (0.03%), this decay is well suited for measuring form factors (F_{V} , F_{A}, and R). The chiral perturbative theory (ChPT) prediction of the decay probability $K^{+}\to e^{+}\nu\ \mu^{+}\mu^{-}$ with a value of $1.12 * 10^{-8}$ is known. The previous experimental result is $(1.7\pm0.5) * 10^{-8}$. We present the research methodology, the first results of signal selection, and the study of the background sources for the decay.

Summary

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