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Measurement of the very rare $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay

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The NA62 experiment at CERN reports the branching ratio measurement $BR(K^+ \rightarrow \pi^+ \nu \bar{\nu})$ at 68% CL, based on the observation of 20 signal candidates with an expected background of 7.0 events from the total data sample collected at the CERN SPS during 2016-2018. This provides evidence for the very rare $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay, observed with a significance of 3.4σ . The experiment achieves a single event sensitivity of $(0.839 \pm 0.054) \times 10^{-11}$, corresponding to 10.0 events assuming the Standard Model branching ratio of $(8.4 \pm 1.0) \times 10^{-11}$. The result represents the most accurate measurement achieved so far of this ultra-rare decay. Future prospects and plans for data taking from 2021 will also be presented.

Summary

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