Contribution ID: **477** Type: **Parallel session talk**

# Search for Physics beyond the Standard Model at NA62

*Thursday 18 July 2024 08:30 (15 minutes)*

Rare kaon decays are among the most sensitive probes of both heavy and light new physics beyond the Standard Model description thanks to high precision of the Standard Model predictions, availability of very large datasets, and the relatively simple decay topologies. The $K^+ \to \pi^+\nu\bar{\nu}$ decay is a "golden mode"for search of New Physics in the flavour sector. The Standard Model provides a high-precision prediction of its branching ratio of less than $10^{-10}$, and this decay mode is highly sensitive to indirect effects of New Physics up to the highest mass scales. The NA62 experiment at the CERN SPS is designed to study the $K^+ \to \pi^+\nu\bar{\nu}$ decay, and provided the world's most precise investigation of this decay using 2016–18 data. Building on this success, the status of the analysis of data collected in 2021–2022, after beam-line and detector upgrades, is presented. NA62 is a multi-purpose high-intensity kaon decay experiment, and carries out a broad rare-decay and hidden-sector physics programme with dedicated trigger lines. New results on searches for hidden-sector mediators and searches for violation of lepton number and lepton flavour conservation in kaon decays based on the NA62 2016–2018 dataset are presented. Future prospects of these searches are discussed.

## Alternate track

## I read the instructions above

Yes

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**Session Classification:** Quark and Lepton Flavour Physics

**Track Classification:** 05. Quark and Lepton Flavour Physics