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New physics searches with kaon and pion decays at NA62

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Searches for the decays $K^+ \to \pi^+ X$ and $\pi^+ \to e^+ N$ are presented using data collected by the NA62 experiment in 2016-2022 and 2017-2024, respectively. Results are interpreted to constrain a range of new physics scenarios covering all four portal model scenarios. Upper limits on the $K^+ \to \pi^+ X$ branching ratio are established at the 10^{-11} level, providing constraints on dark photon, scalar and ALP couplings. From the search for heavy neutral lepton production in $\pi^+ \to e^+ N$ decays of beam pions, upper limits of the extended neutrino mixing matrix element $|U_{e4}|^2$ are established at the 10^{-8} level over the heavy neutral lepton mass range 95-126 MeV/c^2.

Academic position of the presenting author

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