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## Latest results from Kaon experiments at CERN

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An overview of the latest results from Kaon experiments at CERN and the future prospect will be presented. The NA62 experiment collected the world's largest dataset of charged kaon decays in 2016-2018, leading to the first measurement of the branching ratio of the ultra-rare  $K^+ \rightarrow \pi^+ \nu \bar{\nu}$  decay, based on 20 candidates. The radiative kaon decay  $K^+ \rightarrow \pi^0 e^+ \nu \gamma$  ( $Ke3\gamma$ ) is studied with the data recorded in 2017-2018, achieving the most precise measurements of the  $Ke3\gamma$  branching ratio and T-asymmetry. Preliminary results from an analysis of the flavour-changing neutral current  $K^+ \rightarrow \pi^+ \mu^+ \mu^-$  decay led to the most precise determination of the form-factor parameters  $+$  and  $+$  using data collected in 2017-2018. New preliminary results are obtained from an analysis of the  $K^+ \rightarrow \pi^+ \gamma \gamma$  decay using data collected in 2016-2018 with a minimum-bias trigger, leading to an unprecedented sensitivity. This analysis can be naturally extended to search for the  $K^+ \rightarrow \pi^+ A$ ,  $A \rightarrow \gamma \gamma$  process, where  $A$  is a short-lived axion-like particle. The NA62 dataset is exploited to search for light feebly interacting particles (heavy neutral leptons) in Kaon decays. Dedicated trigger lines are employed to collect di-lepton final states, which allowed establishing new stringent upper limits on the rates of lepton flavour and lepton number violating kaon decays. NA62 can also be run as a beam-dump experiment, by removing the Kaon production target and moving the upstream collimators into a "closed" position. Analyses of the data taken in beam-dump mode are performed to search for visible decays of exotic mediators, with a particular emphasis on Dark Photon Models. The first observation of the decay  $K^\pm \rightarrow \pi^0 \pi^0 \mu^\pm \nu$  ( $K00\mu4$ ) by the NA48/2 experiment at CERN and the preliminary measurement of the branching ratio are also presented. The result is converted into the first measurement of the  $R$  form factor in  $Kl4$  decays and compared with the Chiral Perturbation Theory 1-loop predictions.

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