

# XXVI International Workshop on Deep Inelastic Scattering and Related Subjects



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## search for exotic particle at na62

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Searches for heavy neutral lepton (HNL) production in charged kaon decays using the data collected by the NA62 experiment at CERN are reported. Upper limits are established on the elements of the extended neutrino mixing matrix for heavy neutral lepton mass in the range 130-450 MeV, improving on the results from previous HNL production searches. The status and prospects of searches for lepton flavour and lepton number violation in kaon decays at the NA62 experiment is also presented.

The high-intensity setup, trigger system flexibility, and detector performance – high-frequency tracking of beam particles, redundant PID, ultra-high-efficiency photon vetoes – make NA62 particularly suitable for searching new-physics effect from different scenarios. Results from a search for invisible dark photons produced from  $\pi^0$  decays are given.

Fixed target experiments are a particularly useful tool in the search of very weakly coupled particles in the MeV-GeV range,

which are of interest, e.g. as potential Dark Matter mediators. The NA62 experiment at the CERN SPS is currently taking data to measure the ultra-rare

decay  $K \rightarrow \pi \nu \bar{\nu}$ . Owing to the high beam-energy and a hermetic detector coverage, NA62 also has the opportunity to directly search for a

plaethora of long-lived beyond-the Standard Model particles, such as Axion-like Particles and Dark Photons.

In this talk, we will review the status of this searches and give prospects for future data taking at NA62.

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