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A new hydrogen-filled Cherenkov detector for Kaon tagging at the NA62 experiment at CERN

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To ensure the necessary precision for the $K^+ \to \pi^+ \nu \bar{\nu}$ analysis, the NA62 kaon identification detector is required to have a time resolution better than 100 ps, at least 95% kaon tagging efficiency, and a pion mis-identification probability of less than 10^{-4}. For the data collected so far, the tagging of kaons in the NA62 beam has been performed with a Cherenkov detector filled with nitrogen gas as radiator. A new detector using hydrogen (CEDAR-H) as the Cherenkov radiator has been built for the kaon identification in NA62. The CEDAR-H leads to a reduction of beam particle scattering in the gas and background from pile-up events in the detector. The CEDAR-H was commissioned in a two-weeks test beam at CERN at the end of 2022, and approved by the NA62 collaboration to be used in data taking from 2023. The test beam results, commissioning and detector performance on the NA62 beam line are presented in this talk.

Collaboration

NA62

Role of Submitter

The presenter will be selected later by the Collaboration

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