

The kaon identification system in the NA62 experiment at CERN SPS

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The Cherenkov detector identifying kaons in the beam line of the NA62 experiment will be presented. The main goal of the NA62 experiment at the CERN SPS accelerator is to measure the branching ratio of the ultra-rare $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay with 10% accuracy. NA62 uses a 750MHz high-energy un-separated charged hadron beam, with kaons corresponding to $\sim 6\%$ of the beam, and a kaon decay-in-flight technique. An upgraded version of a gas-filled differential Cherenkov detector (CEDAR-KTAG) is used to perform the fast identification of kaons, before their decays. New photon detectors, readout, mechanics, cooling and safety systems have been realised to stand the kaon rate (50MHz average) and to meet the performances required for NA62. The CEDAR-KTAG must provide a kaon identification with an efficiency of at least 95% and precise time information with a resolution below 100ps. The fully equipped CEDAR-KTAG detector, its readout and front-end chain have been successfully commissioned during a pilot run at CERN in 2014. With the data taking started from June 2015, while the NA62 experiment is finalising the detector and read-out commissioning, the CEDAR-KTAG time resolution and efficiency have been measured to be within the required detector performances. The capability to distinguish between kaons and pions has been validated and the development of software trigger algorithms for online kaon identification has been completed.

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