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# The RICH detector of the NA62 experiment at CERN

*Thursday 28 May 2020 16:36 (18 minutes)*

RICH is the Ring Imaging CHerenkov detector of the NA62 experiment designed to measure the branching fraction of the ultra rare $K^+ \to \pi^+\nu\overline{\nu}$ decay. The NA62 experiment took data in 2016-2018. An additional run is foreseen in 2021-2025 to complete the measurement. The RICH detector plays a fundamental role in the $K^+ \to \pi^+\nu\overline{\nu}$ selection rejecting background coming from muons. It features challenging design specifications, in particular a time resolution of 70 ps and a muon misidentification of less than $10^{-2}$ in the momentum range 15-35 GeV/c. We describe the detector design and report on the achieved performance. In a long term prospect (>2026) NA62 is considering the possibility to increase the nominal beam intensity by a factor 4. The time resolution needed to match the incoming $K^+$ and the outgoing $\pi^+$ in $K^+ \to \pi^+\nu\overline{\nu}$ selection must scale accordingly.

## Funding information

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