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High level performance of the NA62 RICH detector

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NA62 is the last generation kaon experiment at the CERN SPS aiming to study the ultra-rare $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay, measuring its branching ratio with a precision better than 20%.

One of the challenging aspect of NA62 is the suppression of background decay channels with branching ratios up to 10 orders of magnitude higher than the signal and with a similar experimental signature, such as $K^+ \rightarrow \mu^+ \nu$.

To this purpose, the NA62 experimental strategy requires, among other conditions, good charged particle identification (PID) capability. A key element of PID is the Ring-Imaging Cherenkov detector (RICH) that, according to the NA62 requirements, identifies μ^+ and π^+ in the momentum range between 15 and 35 GeV/c with a muon rejection factor larger than 100. The latest performance of the RICH on PID for the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ measurement and for other key analyses in NA62 will be presented.

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