

11th International Workshop on Ring Imaging Cherenkov Detectors (RICH2022)



Contribution ID: 72

Type: **presentation**

The Ring Imaging Cherenkov detector of the NA62 experiment at CERN: technical aspects, operational characteristic and basic performance.

Monday 12 September 2022 11:55 (25 minutes)

The NA62 experiment is designed to measure the very rare kaon decay $K^+ \rightarrow \pi^+ \nu_{\mu}$ at the CERN SPS with 10% statistical precision. One of the challenging aspects of the experiment is the suppression of the $K^+ \rightarrow \mu^+ \nu_{\mu}$ decay whose branching ratio is 10 orders of magnitude higher than the one of the $K^+ \rightarrow \pi^+ \nu_{\mu}$ decay. Kinematics cuts and the use of the very different stopping power of muons and charged pions in calorimeters are used to reject the $K^+ \rightarrow \mu^+ \nu_{\mu}$ background. However, a Ring Imaging Cherenkov (RICH) detector with a very long focal length (17 m) is needed in NA62 to further suppress muon contamination by a factor 100 in a sample of charged pions with momentum between 15 and 45 GeV/c while keeping a reasonably high efficiency for the pion selection. With a total time resolution of 70 ps this RICH detector is also used to measure the arrival time of the pion and provide the experiment trigger. The talk will describe the technical aspects and the operation characteristics of the RICH detector with an eye to possible future upgrades and will present, for the first time, the basic performance (time resolution, ring radius resolution, ring centre resolution, single hit resolution and mean number of hits) measured on data collected in 2021/2022 using electron tracks.

Primary author: BUCCI, Francesca (Universita e INFN, Firenze (IT))

Presenter: BUCCI, Francesca (Universita e INFN, Firenze (IT))

Session Classification: Cherenkov light imaging in particle and nuclear physics experiments

Track Classification: Cherenkov light imaging in particle and nuclear physics experiments