

The RICH of the NA62 experiment at CERN

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The NA62 experiment at CERN has been constructed to measure the ultra rare charged Kaon decay into a charged pion and two neutrinos with a 10% uncertainty. The main background is made by the charged kaon decay into a muon and a neutrino which is suppressed by kinematic tools using a magnetic spectrometer and by the different stopping power of muons and pions in the calorimeters. A RICH detector is needed to further suppress the μ^+ contamination in the π^+ sample by a factor of at least 100 between 15 and 35 GeV/c momentum, to measure the pion crossing time with a resolution of about 100 ps and to produce the trigger for a charged track. The detector consists of a 17 m long tank (vessel), filled with Neon gas at atmospheric pressure. Cherenkov light is reflected by a mosaic of 20 spherical mirrors with 17 m focal length, placed at the downstream end, and collected by 1952 photomultipliers (PMTs) placed at the upstream end. The RICH detector installation was completed in the summer of 2014 and the detector was used for the first time during the pilot run at the end of 2014. The RICH was then operated during the NA62 Commissioning Run in 2015 and has been used in the 2016 Physics Run. It must be noted that in 2014 and 2015 the RICH mirrors alignment was not optimal and the need of a better performance in the pion-muon separation was the main reason for the detector maintenance carried out in the 2015-2016 winter shutdown. In this presentation the construction of the detector will be described and the performance reached during the 2014-2015 data-taking will be discussed. Some preliminary results of the 2016 data-taking will also be shown.

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