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The NA62 RICH detector

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The NA62 experiment is designed to measure the very rare kaon dacay K+⟶pi+νν at the CERN SPS with a 10% accuracy. The Standard Model prediction for the branching ratio is (8.5±0.7)×10-11. One of the challenging aspect of the experiment is the suppression of the K+⟶μ+νμ background at the 10-12 level. To satisfy this requirement a Ring Imaging Cherenkov Detector (RICH), able to separate pi± from μ± in the momentum range between 15 and 35 GeV/c, with a μ rejection factor better than 5×10-3, is needed. The RICH must also have a time resolution of about 100 ps to disentangle accidental time associations of beam particles with pions. The RICH will have a very long focal lenght (17 m) and will be filled with Ne gas at atmospheric pressure. Two test beams were held at CERN in 2007 and 2009 with a RICH prototype. The results of the two test beams will be presented: the μ misidentification probability is found to be about 0.7% and the time resolution better than 100 ps in the whole momentum range.

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