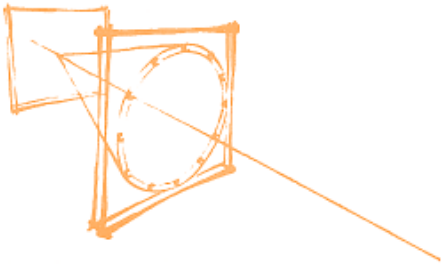

ID de Contribution: **5** Type: **Oral presentation**

The NA62 RICH detector

lundi 3 mai 2010 14:30 (30 minutes)

The CERN NA62 experiment aims at a 10% measurement of the BR of the K+ into a pi+ and two neutrinos. The main background is the K+ decay into a muon and a neutrino, so pion-muon separation is a crucial ingredient. The RICH detector must separate pions from muons at 3 sigma level between 15 and 35 GeV/c momentum. The RICH must also measure the pion crossing time with a 100 ps resolution to avoid fake coincidences with an upstream beam spectrometer. To fufill these requirements a RICH filled with Neon at atmospheric pressure has been chosen, with a radiator length of 17 m. A mosaic of 20 hexagonal or semi-hexagonal mirrors with 17 m focal length, placed at the downstream end of the detector, will reflect the Cherenkov light onto two spots (to avoid the shadow induced by a beam pipe crossing the detector) located at the upstream end of the RICH where 2000 photomultipliers in total will be placed. Single anode photomultipliers, put at 18 mm minimum distance among each other have been chosen to match the required time resolution and Cherenkov angle sensitivity. A prototype was built to validate the project, with the same longitudinal dimensions (17 m) but reduced transverse size with respect to the final detector. In 2007 the prototype, equipped with 96 photomultipliers and exposed to a pion beam at CERN, showed a time resolution smaller than 100 ps. In 2009 in another test beam the prototype was equipped with 414 photomultipliers and demonstrated the capability to suppress by a factor 100 the muon background with respect to charged pions in a 15-35 GeV/c momentum range. The detector, approved and fully financed, is now in its construction phase with commissioning foreseen in 2012. The details of the project and the results of the test beams will be discussed.

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plenary session

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Classification de Session: Cherenkov Imaging in particle and in nuclear physics experiments

Classification de thématique: Cherenkov imaging in particle and nuclear physics experiments