# The COMPASS RICH1 Detector

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A large acceptance gas RICH detector is presently under construction for the spectrometer of the COMPASS Experiment. Its design parameters are presented and the main characteristics of the vessel, the mirrors system, the photon detectors and the front-end electronics are discussed together with some results from prototyping activities.

## 1. The COMPASS Experiment

The COMPASS Experiment [1] (NA58) is a new generation fixed target experiment at the CERN SPS, with the goal of investigating the hadron structure and spectroscopy.

It foresees a rich spin physics program with the use of the CERN muon beam and solid polarised targets. Deep inelastic scattering inclusive and semi-inclusive cross-section asymmetries will be measured with high accuracy to access all main partonic spin distribution functions (both longitudinal and transverse); in particular, the gluon polarisation $\Delta G/g$ will be obtained from the open charm leptoproduction asymmetry.

An extensive set of measurements is also foreseen with hadron beams, mainly aimed to study charm production and spectroscopy, Primakov reactions and the question of exotic states, glueballs in particular, in the hadronic spectra.

To perform these measurements COMPASS is building a new apparatus, capable of standing high rates, detecting and identifying particles over a large angular range ($\sim$ 200 mrad) and dynamical range (up to $\sim$ 120 GeV/c).

The set-up consists of two magnetic spectrometers (a large acceptance one followed by a high momentum spectrometer), each equipped with a RICH, hadron and electromagnetic calorimetry, and muon filters.

A technical run is foreseen in year 2000, followed by physics measurements with muon beam.

During the first stage of the experiment, part of the set-up will not be instrumented and in particular the RICH detector of the second spectrometer, RICH2, will not be present.

## 2. RICH1 design parameters

Almost all physics measurements of COMPASS need good hadron identification; for instance a large statistics clean sample of charmed mesons, which is essential for both muon and hadron beam physics programs, can only be obtained by unambiguously identifying pion and kaon tracks.

The requirement to separate $\pi$ and $K$ with momenta from few GeV/c up to $\sim$ 60 GeV/c in the entire acceptance of the large angle spectrometer, at the foreseen rates and multiplicities, together with the need of minimising the amount of material and to fulfil the time and financial limitations

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