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## The RICH detector for the CBM experiment at FAIR

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The CBM fixed-target experiment at FAIR will investigate highly compressed baryonic matter at moderate temperatures in heavy-ion collisions with 2-15 AGeV beam energy at the SIS100 accelerator at FAIR from 2020 on and at SIS300 with beam energies up to 45 AGeV once this becomes available. The CBM experiment aims at understanding and characterizing nuclear matter at high net-baryon densities but moderate temperatures focussing on the investigation of rare probes as for example electromagnetic radiation.

The major detector for clean electron identification in the CBM experiment at SIS 100 will be a RICH detector using CO<sub>2</sub> as radiator gas, spherical glass mirrors with reflective Al+MgF<sub>2</sub> coating as focusing elements and a photodetector plane consisting of an array of H12700 MAPMTs from Hamamatsu. This detector concept has been tested extensively with a real-size RICH prototype in testbeams and proven to show a high performance. The testbeam evaluations included a detailed study of layers of wavelength-shifting films for enhanced UV sensitivity and the development of MAPMT readout. Several MAPMT sensors were tested in this setup but also for radiation hardness in separate experimental campaigns with thermal neutron and gamma irradiation. As result the H12700 sensor was ordered from Hamamatsu in spring 2015. First delivery is expected for autumn 2015. In order to make use of the early delivery of these photosensors with respect to the CBM time scales and to recuperate performance losses of the HADES RICH detector due to aging of the CsI photocathode, the HADES RICH detector will be upgraded with these photosensors and readout electronics as developed for CBM. This upgrade program will be finished for the next HADES data taking period starting 2017.

In this contribution we will report on the design and status of the CBM RICH development, on the beamtime results obtained with the RICH prototype and the HADES RICH upgrade plans.

### On behalf of collaboration:

CBM

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