



# XXIV QUARK MATTER DARMSTADT 2014

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## Development of the photon detection system for the CBM RICH

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The CBM-RICH detector is an essential component of the CBM experiment which will be built at the Facility for Antiproton and Ion Research, FAIR, in Darmstadt.

It will serve for electron identification and pion suppression for particle momenta up to  $\sim 8$  GeV/c.

Pion suppression by up to 4 orders of magnitude is necessary in order to get access to rare di-electron decays of light vector mesons, such as the rho meson, one of the key observables to study the highly compressed matter produced in the heavy ion collision process.

The CBM-RICH detector will use CO<sub>2</sub> gas as radiator medium. Spatially resolved detection of Cherenkov photons will be achieved using Multianode Photomultipliers (MAPMT) or Microchannel plate detectors (MCP).

Only these devices can provide sufficient detection efficiency, time resolution and rate capability necessary to operate the CBM experiment at Au-Au interaction rates up to 10 MHz.

We have studied and compared in detail different sensor options, such as the 2x2 inch Hamamatsu H8500, the new H12700, the 1x1 inch R11265, or the XP85012 MCP from Photonis.

Single photon XY scans combined with a self triggered readout system allow to achieve many different performance parameters, such as efficiency, cross talk, and dark noise in a single lab measurement.

During two test beam campaigns with a CBM-RICH prototype detector at CERN-PS we could compare the different sensor options in beam.

In this poster, we present our studies with respect to the photon detection system for the CBM-RICH detector.

### On behalf of collaboration:

CBM

**Primary author:** PAULY, Christian (Bergische Universitaet Wuppertal (DE))

**Presenter:** PAULY, Christian (Bergische Universitaet Wuppertal (DE))

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