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Performance of the new hadron blind HADES RICH in heavy ion collisions*

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The ring imaging Cherenkov detector of the High Acceptance Dielectron Spectrometer (HADES) at GSI Darmstadt, Germany, has been upgraded with a new photon detection device based on 428 multianode photo electron multipliers (Hamamatsu H12700) partly coated with p -Terphenyl as a wavelength shifter.

It is the key component for efficient identification of electrons and positrons emitted from hot and dense fireballs produced in heavy ion collisions.

Operated with a gaseous C_4H_{10} (isobutane) radiator the RICH is essentially hadron blind for particle momenta up to approximately $2 \text{ GeV}/c$.

In total, 27392 MAPMT channels are read out by the FPGA based DIRICH readout electronic scheme which is also going to be incorporated in the future CBM-RICH and PANDA-DIRC detectors.

The DIRICH readout allows to measure leading and trailing edges for each pixel pulse and hence time over threshold and hit arrival time down to sub-nanosecond precision.

Within the FAIR-0 research program, a $Ag^{136}+Ag^{136}$ run at $E = 1.58A \text{ GeV}$ incident energy marked the first beam time use of the upgraded RICH.

The detector could be operated at sustained triggered event rates of 16 to 18 kHz with high electron purities while keeping large efficiencies for a recorded data sample of $\sim 15 \times 10^9$ events.

We present key features of the upgrade and report performance results of the RICH for this whole measurement campaign.

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