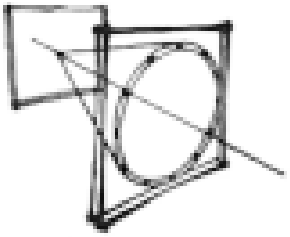

Contribution ID: **61** Type: **Poster**

Development of the CBM RICH readout electronics and DAQ. Prototype results, time resolution with and without WLS coverage, radiation hardness tests.

Monday 5 September 2016 15:15 (15 minutes)

The CBM experiment at the future FAIR facility will investigate strongly interacting matter at high net-baryon densities but moderate temperatures in heavy-ion collisions with beam energies up to 11 AGeV (SIS 100). Electromagnetic radiation from the fireball is among the most sensitive probes for the created matter. In order to identify di-electrons in a momentum range up to 8 GeV/c, a RICH detector will be employed. The photodetector makes use of H12700 MAPMTs from Hamamatsu, in order to enhance the quantum efficiency in the UV WLS coatings with p-terphenyl will be used.
This contribution will present results from a prototype of the triggerless RICH readout electronics and DAQ chain used in a testbeam experiment with a RICH prototype at CERN-PS and independent tests in the lab. The MAPMTs were partially covered with p-terphenyl as WLS coating. The readout chain connects the H12700 MAPMT with the FPGA-based frontend board PADIWA consisting of a preamplifier and discriminator. Leading and trailing edges of the logical LVDS signal are then digitized by an FPGA-based TDC on the multifunctional TRB3 board. The CBM specific FLIB board was used as interface between the readout electronics and the PC, running DAQ and analysis software applications using CbmRoot. Necessary unpacking, calibration and analysis software modules have been developed. A versatile performance analysis of the readout and DAQ chain of this type has been conducted for the first time. First results on the time resolution of the readout will be shown, also including results from the WLS coated MAPMTs. The WLS decay time determined this way compares well with results known from literature. The time resolution achieved is well within the limits for running the CBM experiment at 10 MHz interaction rate.
In addition separate radiation hardness tests of the WLS coatings will be presented showing no degradation of the fluorescence intensity up to doses of 3x10ˆ12 neq/cmˆ2 or 100 Gy.

Registered

Yes

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