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Optical readout of a Triple-GEM detector with a CMOS sensor

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In last years, the development of optical sensors has produced objects able to provide very interesting performance. Large granularity is offered along with a very high sensitivity.

CMOS sensors with millions of pixels able to detect as few as two or three photons per pixel are commercially available and can be used to read-out the optical signals provided by tracking particle detectors.

In this work the results obtained by optically reading-out a triple-GEM detector by a commercial CMOS sensor will be presented.

A standard detector was assembled with a transparent window below the third GEM allowing the light to get out. The detector is supplied with an Ar/CF₄ based gas mixture producing 650 nm wavelength photons matching the maximum quantum efficiency of the sensor (about 80%).

In the presentation the measured performance as light yield, space resolution and detection efficiency will be shown.

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