

Development of a GridPix X-ray polarimeter

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In gaseous detectors it is possible to determine the polarisation of an X-Ray beam by tracking photoelectrons which are created in photoelectric interactions of the photons with the gas molecules. In this interaction the emission angle of the photoelectrons is correlated with the polarisation plane of the beam.

Depending on the photon energy and on scattering of the photoelectrons on gas molecules the length of the relevant part of the track is only in the order of a few hundred microns. Thus, a high tracking resolution is needed. This is achieved with the GridPix - a combination of the highly granular Timepix3 pixel ASIC and a photolithographically postprocessed MicroMegas which holes are aligned with the pixels of the ASIC.

In this talk I will present the working principle of a GridPix X-ray polarimeter and how it depends on detector parameters as well as first measurement results. Furthermore, I will give an outlook on our future plans for the development of such a detector.

TIPP2020 abstract resubmission?

Yes, this would have been presented at TIPP2020.

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