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Type: Postar

Characterization of MALTA monolithic pixel detectors using X-rays.

The MALTA monolithic active pixel detector has been developed to address the challenges anticipated in future high-energy physics detectors. As part of its characterization, we conducted fast-timing studies necessary to provide a figure of merit for this family of monolithic pixel detectors. However, conventional Laser techniques are limited due to reflection on the metal layers of the sensor leading to low material penetration. To overcome this we designed a triggered micro-X-ray setup that enables precise timing measurements using X-rays. This setup employs a micro-X-ray source to generate short pulses from a Cu-Cr target, meticulously synchronized with an input trigger source. We validated the setup using an LGAD and subsequently characterized the timing response of a MALTA and MALTA2 pixel detector prototype, yielding insights into their timing performance.

Field of contribution

Experiment

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Track Classification: Future experiments and detector development