

Timing response characterization of MALTA monolithic pixel detectors.

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The MALTA monolithic active pixel detector has been developed to meet the stringent demands of future high-energy physics experiments. To assess its capabilities, we performed fast-timing studies to define a figure of merit for this family of detectors. Conventional laser techniques are hindered by reflections from the sensor's metal layers, which restrict material penetration. We developed a triggered micro-X-ray system designed for precise timing measurements, that employs a micro-X-ray source that generates X-rays from a Cu-Cr target, synchronized with an external trigger signal. After validating the system with an LGAD, we used it to evaluate the timing performance of MALTA and MALTA2 pixel detector prototypes, providing insights into their operational characteristics.

Author: DASH, Ganapati (Indian Institute of Technology Madras (IN))

Co-authors: SOLANS SANCHEZ, Carlos (CERN); Prof. BEHERA, Prafulla (Indian Institute of Technology Madras (IN))

Presenter: DASH, Ganapati (Indian Institute of Technology Madras (IN))

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