

# Tristan10M detector: Characterization of a large area detector for time resolved experiments based on Timepix3 chip

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Tristan10M is a 10 million pixel area detector based on the Timepix3 chip, a member of the Medipix family of ASICs for X-ray and particle imaging and detection developed by the Medipix collaboration led by CERN. The Timepix3 ASIC can work in event driven mode in addition to the standard frame based mode. Event driven mode enables the chip to send out a data packet containing the pixel coordinate, time over threshold and time of arrival immediately after each hit is processed by a pixel. Thanks to these capabilities of the Timepix3 ASIC, the Tristan detector is ideal for time-resolved experiments. The Tristan 10M detector is organized in a 5 x 2 module matrix, each module being made up of sixteen Timepix3 chips bump-bonded to a monolithic pixelated silicon sensor. In this contribution, we will report on the status of the detector development, and characterization results in terms of threshold equalization, energy calibration, and flat-field correction. A number of initial commissioning experiments have been carried out on the small molecule single crystal diffraction beamline I19 at Diamond light source, which we will also report on here. In particular, X-ray powder diffraction from a standard sample, LaB6, was performed to evaluate the inter-module alignment in six degrees of freedom and to produce a correction matrix suitable for application to future experimental data.

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