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Implementation of large area CdTe Hybrid Pixel detector for purpose of X-ray spectroscopic imaging.

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ABSTRACT

In this contribution the performance of a CdTe direct converting photon counting detector in spectroscopic imaging is investigated. The tiled detector, which is based on the Timepix readout ASIC, features a frame-rate of 40fps and edgeless sensors.
In comparison to Si, the main advantage of using high-efficiency sensor materials like CdTe is the significantly higher stopping power for high energy photons (figure 1).
This kind of large area detectors represents a suitable tool for the purpose of X-ray spectroscopic imaging of large samples, employing single event analysis and THL(energy threshold) scanning respectively.
The measurements based on this detector will carry additional spectroscopic information about the materials within the sample, which will help us for the separation process of the materials based on their attenuations characteristics.

Figure. 1. X_ray attenuation in Sillicon and CdTe sensors

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