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## P2.20: Characterization of a Megapixel JUNGFR AU Detector with Novel GaAs:Cr Sensor for Photon Science Applications

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As more synchrotrons and X-ray free electron lasers move towards using high (> 20 keV) energy X-rays, there is an increased need for efficient, large area, high-speed X-ray detectors for use at these facilities. High-Z sensors, such as GaAs:Cr, are preferable to Si in detectors of high-energy photons, due to their increased stopping power and therefore improved efficiency at higher energies. However, high-Z sensor materials often feature defects that introduce distortions into the images recorded. These defects also have an adverse impact on the material's charge-transport properties and enable unwanted behaviour such as afterglow effects and polarization.

We will present the characterization of a one-megapixel detector based on the JUNGFR AU1.0 ASIC with a sensor made from a new type of GaAs:Cr. The charge-integrating nature of JUNGFR AU makes it ideal for studying the behaviour and properties of new sensor materials. Results will include measurements of the new material's charge-carrier properties and propensity to display afterglow effects, as well as the device's I-V and I-t characteristics, gain and energy resolution. We will compare the performance of the new material with that of GaAs:Cr sensors from other sources, also bonded to JUNGFR AU, to quantify the degree of improvement offered by the new material.

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