MATTER AND TECHNOLOGIES

Contribution ID: **202** Type: **Poster DTS**

High-Z sensors at MHz repetition rate FELs: first AGIPD results

Monday 3 November 2025 19:30 (3 minutes)

To address new applications in the 20–30 keV photon energy range at the European XFEL, where silicon sensors lose quantum efficiency, the AGIPD consortia has developed an AGIPD detector prototype with high-Z sensor materials. An electron-collecting version of the chip (ecAGIPD) was designed to leverage from the higher mobility and longer lifetime of electrons with respect to holes in the candidate materials: chromium-doped gallium arsenide (GaAs:Cr) and high-flux cadmium zinc telluride (CdZnTe). This work reports on the characterization of GaAs and high-flux CdZnTe ecAGIPD prototypes at the HED instrument at the European XFEL. Their time response, linearity and performance at 2.2 and 4.5 MHz frame rates were evaluated. Preliminary results demonstrate good linearity of both materials up to 1.6e+03 15 keV photons/mm2/pulse, and a residual after-pulse signal corresponding to less than one photon on CdZnTe, up to an estimated flux of 1.2e+05 24 keV photons/mm2/pulse.

Speed talk:

I am unwilling/unable to present a speed talk

Author: MAGALHAES SUAREZ, Debora (FS-DS (Detektorsysteme))

Co-authors: KLUJEV, Alexander (FS-DS (Detektorsysteme)); STROHM, Cornelius (DESY Photon Science); PENNICARD, David (FS-DS (Elektronik und Data)); GRAAFSMA, Heinz (FS-DS (Detektorsysteme)); HIRSEMANN, Helmut (FS-DS (Detektorsysteme)); SZTUK-DAMBIETZ, Jolanta (Eur.XFEL (European XFEL)); NIEMANN, Magdalena (FS-DS (Detektorsysteme)); RAMILLI, Marco (Eur.XFEL (European XFEL)); WILSON, Matt (Science & Technology Facilities Council); VEALE, Matthew (None); LANGE, Sabine (FS-DS (Detektorsysteme)); PALUTKE, Steffen (Eur.XFEL (European XFEL)); LAURUS, Torsten (FS-DS (Detektorsysteme)); TRUNK, Ulrich (FS-DS (Detektorsysteme)); ROVENSKY, Vratko (Eur.XFEL (European XFEL)); KONOPKOVA, Zuzana (Eur.XFEL (European XFEL))

Presenter: GRAAFSMA, Heinz (FS-DS (Detektorsysteme))

Session Classification: Poster