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The X-ray calibration facility for the characterization of Gas pixel Detectors

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The X-ray Calibration Facility (XCF) at the University and INFN of Torino is dedicated to the calibration and characterization of X-ray detectors, sensible to position, energy and polarization.

The facility is focused on the study of the Gas Pixel Detectors [1] for x-rays polarimetry of astrophysical sources, developed at INFN-Pisa. Such detectors are the core of the detector units of the IXPE (Imaging X-ray Polarimetry Explorer) mission, that was launched by NASA on December 2021 and is currently taking data. Upgrades of the GPD are under study for future x-ray polarimetry missions.

The XCF facility hosts two X-ray tubes spanning energy ranges from 2 to 8 keV, providing two distinct beams, one of which is polarized via Bragg's diffraction. A positioning system allows to move the detector to be tested under the polarized or unpolarized beams.

Although conceived to qualify GPDs, XCF can support R&D programs for innovative position-energy and polarization-sensitive X-ray detectors. In this contribution the Gas pixel Detector and the XCF facility are described.

[1] L. Baldini et al, Design, construction, and test of the Gas Pixel Detectors for the IXPE mission, Astroparticle Physics, Volume 133, 2021,102628, https://doi.org/10.1016/j.astropartphys.2021.102628.

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