

Construction and test of the Gas Pixel Detectors for the IXPE Mission

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After a gap of more than 40 years since the first observations in space, the window for astronomical polarimetry in the soft X-ray band has recently reopened, thanks to the advancement in the field of gas polarimeters based on the photoelectric effect.

The NASA Imaging X-ray Polarimetry Explorer (IXPE) mission, scheduled for launch in late 2021, will bring into orbit three identical detectors that represent the latest generation of such technology, the Gas Pixel Detector, with the aim of measuring for the first time the polarization of tens of astrophysical objects like black holes, magnetars, pulsars, active galactic nuclei and supernova remnants in the energy range between 2 and 8 keV.

Here I will describe the design, assembly and test of the Gas Pixel Detectors for the IXPE mission, which was carried over, for the largest part, at the INFN facilities in Pisa. The work culminated, in early 2020, with the delivery of the flight units for integration on the satellite, which is currently being finalized.

I will also discuss the performance of the detectors, in relation to the scientific program of the mission.

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