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## Design of the SFA and PFA instrument onboard eXTP

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The eXTP (enhanced X-ray Timing and Polarimetry) mission is a flagship international collaboration mission led by China, with large contribution from European countries. The eXTP mission is designed to study the equation of state of ultra-dense matter under extreme conditions of strong gravity, density and magnetic field. Its primary targets contain the isolated and binary neutron stars, strong magnetic field systems like magnetars, and stellar-mass and supermassive black holes. The mission carries four main instruments, the Spectroscopy Focusing Array (SFA), the Polarimetry Focusing Array (PFA), the Large Area Detector (LAD) and the Wide Field Monitor (WFM), enabling for the simultaneous spectral-timing-polarimetry observation of cosmic sources in the energy range from 0.5-30 keV. The LAD and WFM are led by European countries, the SFA and PFA are led by China (IHEP, CAS). The SFA and PFA payloads include 9 and 4 identical telescopes respectively. The SFA and PFA telescopes are based on Nickel electroforming Wolter-I mirror technology, with focal length 5.25m and a field of view 12 arcmin. The angular resolutions of SFA and PFA are 1 arcmin and 30 arcsec for spectral-timing and imaging requirements. To achieve good energy and time resolution, a 19 cells SDD is the baseline detector of SFA. The focal plane detectors of PFA use gas pixel detectors (GPDs), with a sensitive region of 1.5 cm×1.5 cm. In this paper we provide an overview of the SFA&PFA instrument designs, including optics and detectors.

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