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## Development of novel Compton polarimeters and imagers

To study fundamental processes in atomic collisions and perform polarisation diagnostics of hot fusion and astrophysical plasmas we develop a broad range of polarisation sensitive x-ray and gamma-rays detectors. Two detectors are based on Silicon PIN diodes and Silicon Drift Detectors and dedicated to the energy range of 10-30 keV. This is the lowest energy range that was accessed by the Compton and Rayleigh polarimeters. For the energy range of 30 keV - 2 MeV we use a segmented planar germanium detector. It employs a novel technique of Pulse Shape Analysis of the detector signals for a 3D sensitivity to the positions of the x-ray interactions. With this detector we for the first time employed the techniques of Compton Imaging and background reduction in a physics experiment. It also achieved the polarisation resolution of 0.3 deg which is the record for Compton polarimetry. To improve this further we develop a high resolution polarimeter that is based on a rotationally symmetric annular planar segmented germanium detector.

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