

Abstract Submitted
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Time Projection Chamber Polarimeters for X-ray Astrophysics

JOANNE HILL, NASA/GSFC, KEVIN BLACK¹, Rockcreek Scientific, KEITH JAHODA, NASA/GSFC — Time Projection Chamber (TPC) based X-ray polarimeters achieve the sensitivity required for practical and scientifically significant astronomical observations, both galactic and extragalactic, with a combination of high analyzing power and good quantum efficiency. TPC polarimeters at the focus of an X-ray telescope have low background and large collecting areas providing the ability to measure the polarization properties of faint persistent sources. TPCs based on drifting negative ions rather than electrons permit large detector collecting areas with minimal readout electronics enabling wide field of view polarimeters for observing unpredictable, bright transient sources such as gamma-ray bursts. We described here the design and expected performance of two different TPC polarimeters proposed for small explorer missions: The PRAXyS (Polarimetry of Relativistic X-ray Sources) X-ray Polarimeter Instrument, optimized for observations of faint persistent sources and the POET (Polarimetry of Energetic Transients) Low Energy Polarimeter, designed to detect and measure bright transients.

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