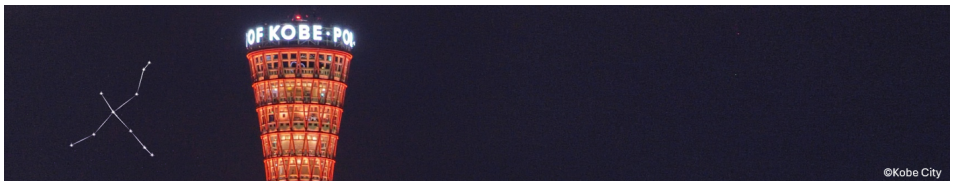

Contribution ID: **44** Type: **not specified**

Wide-Field Hard X-ray Polarimetry with a Large-Volume TPC

Tuesday, 24 February 2026 16:25 (1 minute)

We present a large-volume, wide–field-of-view Time Projection Chamber (TPC) for hard X-ray polarimetry, derived from technology developed for directional dark-matter searches. The detector uses a triple-GEM stack and optical readout: secondary scintillation is imaged by a scientific CMOS (sCMOS) camera, enabling 3D reconstruction of photoelectron tracks in gas. The prototype (3.7 cm radius, 5 cm drift) provides full track imaging in the 5–50 keV band, with ˜15° angular and 10–15% energy resolution between 5 and 45 keV. Calibration with a ^{90}Sr source and polarized X-ray beams yields modulation factors at 8.7, 13.0, and 17.4 keV, exceeding 0.4 at 17 keV. We outline a next-generation chamber to explore gas mixtures and pressures, a machine-learning-based pipeline for on-board data reduction, and first estimates of background and signal-to-noise for Crab-like sources in Low Earth Orbit, highlighting the potential of this flexible TPC platform for future hard X-ray polarimetry missions.

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Session Classification: Poster session