

W55a Making the invisible visible: Magnetic Fields in Accretion Flows Revealed by X-Ray Polarization

Barnier Samuel, Chiba University ; Done Chris, Durham University

The advent of X-ray polarization, marked by the launch of IXPE in 2021, has redefined the X-ray astronomy field. IXPE has yielded significant insights into the structure of black hole accretion flows. However, despite substantial results, certain constraints remain unexplored. Faraday rotation is a natural occurrence when polarized waves traverse a dense and magnetized region. Here, we show why Faraday rotation can not always be neglected for X-ray photons escaping a stellar mass black hole's magnetized accretion flow. We will explore its effects on the unresolved polarized beam observed by IXPE. And finally, we will highlight how this phenomenon provides the first observational constraints on the magnetic field strength and structure within a stellar mass black hole's accretion flow, making the invisible visible.