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# Contemporaneous X-ray and Optical Polarization of EHSP Blazar H 1426+428

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## Abstract

We present the first contemporaneous X-ray and optical polarimetric measurement of the extremely high synchrotron peaked (EHSP) blazar H 1426+428. The X-ray polarimetric observations were undertaken using the Imaging X-ray Polarimetry Explorer (IXPE) on 2024 May 27 and 2024 July 5. The IXPE pointings were accompanied by contemporaneous optical observations from the Observatorio de Sierra Nevada, Calar Alto Observatory, and the Perkins Telescope Observatory. While we observed the X-ray degree of polarization to be  $>20\%$ , the polarization in the optical band was found to be only 1-3%. This trend has been observed in several HSP blazars with available optical and X-ray polarimetric data and is typically explained in terms of energy stratification downstream of a shock. However, we observed a significant difference between the optical and X-ray polarization angles, a feature that has been observed in certain HSP blazars, such as Mrk 421, but remains a relatively rare or underreported phenomenon. We discuss possible scenarios for these findings within the framework of a partially turbulent jet model.

