

Multiwavelength and X-ray Polarization Study of BL Lacertae

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The origin of high-energy emission in blazars, a subclass of active galactic nuclei known for their variable, non-thermal emission across the electromagnetic spectrum, remains highly debated. Traditional one-zone models have struggled to explain the dynamic nature of these emissions, prompting more sophisticated approaches. The recent availability of X-ray polarization observations offers a new way to distinguish between competing models. By combining multiwavelength and polarization campaigns with advanced spectral energy distribution models, we focus on X-ray polarization observations of the blazar BL Lacertae during flaring and quiescent γ -ray states. Our results indicate that inverse-Compton scattering from relativistic electrons dominates X-ray emissions across different models.

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