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Multi-gamma-ray-state SED analysis of highly variable blazars

Thursday 27 February 2025 14:15 (18 minutes)

In the presentation, I will discuss the results of a comprehensive multi-wavelength investigation of gamma-ray-bright BL Lac objects, utilizing data from the Fermi Large Area Telescope (LAT) and the Swift Observatory (XRT and UVOT) to analyze spectral energy distributions (SEDs) and temporal characteristics of these sources. The research focuses on a sample of bright and highly variable BL Lac objects: Mrk 421, S5 0716+71, PKS 2155-304, and OJ 287. We performed a multi-state SED analysis, systematically examining the sources across diverse flux states: quiescent, flaring, and intermediate states. The SED analysis reveals interesting and complex behaviors across the observed sources. A detailed investigation of PKS 2155-304 highlighted its complex behavior, while the analysis of OJ 287 provided particularly compelling evidence of a notable shift in X-ray emission from the inverse Compton to the synchrotron peak region, constraining the physical processes at the emission sites. Through modeling, we obtained crucial parameters characterizing the jet environment. These parameters provide insights into the physical conditions, such as particle acceleration and energy transfer processes, within the relativistic jets.

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