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A model-driven search for extreme BL Lacs among Fermi-LAT blazar candidates.

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The emission of very-high-energy photons (VHE, E>100 GeV) in active galactic nuclei (AGN) is closely connected with the production of ultra-relativistic particles. Among AGN, the subclass of extreme BL Lacertae are of particular interest because they challenge state-of-art models on how these cosmic particle accelerators operate. By cross-matching two gamma-ray catalogs (this is, 4FGL-DR2 and 2BIGB), we identified 23 high-synchrotron-peaked (HSP) blazar candidates with photometric or spectroscopic redshifts, good multiwavelength coverage, that are possibly detectable by VHE instruments. We performed a new analysis of Fermi Large Area Telescope data including the effects of attenuation from the extragalactic background light and complemented these results by collecting multiwavelength data from optical, radio and X-ray archival observations. Their broadband spectral energy distributions were interpreted in terms of synchrotron-self-Compton models with external-Compton components and compared with the properties of prototypical extreme HSP blazars. Finally, we test their detectability with imaging atmospheric Cherenkov telescopes (IACTs) and propose a new method for selecting these extreme targets for these ground-based telescopes.

Keywords

extreme blazars, emission models, jets, agn

Collaboration

Ferrmi-LAT

other Collaboration

Subcategory

Experimental Results

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