Contribution ID: **30** Type: **Contributed Talk**

A multi-wavelength spectral characterization of extreme BL Lacertae blazar candidates hidden in the 4FGL catalog.

Tuesday 11 October 2022 12:30 (15 minutes)

Blazars are jetted radio-loud active galactic nuclei of particular interest in astroparticle physics. Their non-thermal emission, which extends from radio to gamma rays, dominates their broadband spectrum and it is proof of cosmic particle acceleration and production of ultra-relativistic particles. Of particular importance in gamma-ray astronomy are the extreme high-synchrotron-peak (EHSP) BL Lac objects. This subclass is mainly characterized by inefficient accretion and radiation processes, and a high-energy emission which is expected to peak at TeV energies. However, only a rather limited number of these sources are known. In this talk, we show a novel methodology for their identification based on observations from NASA's Fermi Gamma-ray Space Telescope plus archival radio, optical, and X-ray data. This strategy allows a systematic study of their physical properties. Our main results are (1) finding 17 new EHSP blazars, increasing significantly their number; (2) that only 2 of them are expected to be detectable with Cherenkov telescopes, including the Cherenkov Telescope Array, in contrast with the general belief that these sources are efficient TeV emitters; and (3) interestingly, these 2 objects are outliers relative to their magnetic versus kinetic energy density. We discuss the interpretation of these results.

Track

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Session Classification: Plenary 4