Contribution ID : **714** Type : **Oral talk**

Systematic search for gamma-ray periodicity in active galactic nuclei detected by the Fermi-Large Area Telescope

Friday, 9 October 2020 18:10 (15)

Blazars can show variability on a wide range of timescales, however, whether this variability displays a specific pattern or not is still an open issue. In this context, the search for periodicity in the gamma-ray emission from blazars is an on-going challenge. In this talk, we present the results from Peñil et al (2020), where we use the first nine years of gamma-ray data collected by the Fermi Large Area Telescope. We apply several time-series methods to pinpoint potential temporal patterns in the light curves of almost two thousand blazars included in the Fermi-LAT catalogs. Our analysis finds 11 AGN with significant evidence of periodicity, of which 9 are identified for the first time. The discovery of periodic emission in blazars can provide crucial information about the inner regions of the accretion disk, the structure of the jet, and potentially unveil the presence of binary supermassive black holes.

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Session Classification : Astroparticle Physics

Track Classification : Astroparticle physics