

Deciphering the Dual Components of LHAASO J2032

LHAASO J2032 is an ultra-high-energy extended gamma-ray source, one of the twelve first reported by LHAASO in 2021. It is potentially linked to the gamma-ray binary system J2032+4127. With four years data from the LHAASO, we have now resolved two distinct components within this source. The first is a compact source situated close to the binary system, exhibiting an exceptionally hard spectrum—likely a result of inverse Compton scattering. Besides, the sharp cutoff of SED indicates a super-exponential cutoff power-law electron spectrum, imposing significant constraints on theories of particle acceleration mechanisms. The second is an extended source characterized by a comparatively soft spectrum. Intriguingly, both components demonstrate a cutoff energy at nearly 30 TeV.

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