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Searching for Transient Gamma-ray Sources with LHAASO-KM2A

Gamma rays serve as crucial messengers in the non-thermal universe, unaffected by cosmic magnetic fields, thus preserving their original directional information and playing a vital role in resolving the origins of cosmic rays. Transient cosmic gamma-ray sources, such as AGNs (Active Galactic Nuclei), GRBs (Gamma-Ray Bursts), and XBs (X-ray Binaries), among others, are significant producers of ultra-high-energy gamma rays. Studying their high-energy photons aids in understanding particle acceleration physics, constraining physical mechanisms such as EBL (Extragalactic Background Light) absorption, and shedding light on their internal structures and activities. Investigating the occurrence of gammaray transient events that may exceed the predictions of current theoretical models also contributes to the refinement and development of these theories. Due to the uncertainty in the positions of gamma-ray transients, their brief and unpredictable variability, especially in short bursts within gamma-ray bursts where variability may be extremely brief, identifying and subsequently researching these sources presents significant challenges.Crucially, the LHAASO-KM2A array's wide field of view, high sensitivity, and broad energy range ideally position it to conduct searches for transient sources, raising the prospect of discovering new transient phenomena.

Collaboration(s)

the LHAASO collaboration

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