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Observation of Active Galactic Nuclei Through the Eyes of CTA-LST-1

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The next generation facility for gamma-ray ground-based observations is the Cherenkov Telescope Array (CTA) observatory, which encompasses three distinct sizes of imaging atmospheric Cherenkov telescopes (IACTs). Among these, the Large-Sized Telescopes (LSTs) of CTA, featuring a mirror dish with a diameter of 23 meters, are engineered to detect the faint atmospheric showers from the lowest energy gamma-rays accessible through the Cherenkov imaging technique, being sensitive to energies from about 20 GeV up to a few TeV. The first prototype LST, LST-1, was officially inaugurated at the Observatorio del Roque de Los Muchachos in La Palma (Canary Islands, Spain) in 2018, and is presently in the commissioning phase. As of the present date, it has accumulated more than 1400 hours of observational data. From 2020 to 2022, in addition to the detection of notable Galactic sources (e.g. Crab Nebula, Crab Pulsar, RS Ophiuchi nova), LST-1 has detected several known gamma-loud active galactic nuclei (AGN), including Mrk 421, Mrk 501, 1ES 1959+650, 1ES 0647+250, PG 1553+113, among others. In this talk, we present analyses of energy spectra and the light curves reconstructed from those observations, down to energies of a few tens of GeV, close to the energy threshold of the LST design, and further demonstrating its capabilities. Additionally, we explore the potential for detecting AGN flaring events using LST-1, discussing the prospects and implications for future astrophysical research.

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