

Search for VHE Short-Timescale Variability in PG1553+113

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PG 1553+113 is a high-frequency peaked BL Lac object (HBL), with redshift 0.433, detected with the current generation of IACTs (Imaging Atmospheric Cherenkov Telescopes) up to ~ 1 TeV. Interestingly, the continuous gamma-ray lightcurve collected by Fermi-LAT since 2008 showed a signature of a periodic modulation of 2.18 ± 0.08 years at energies above 100 MeV and 1 GeV. In addition, the source shows clear variability down to day-scale in all bands. XMM-Newton data recently showed rapid variability in the X-ray band down to 2.4 ± 0.7 ks.

Short-timescale (sub-hour) variabilities are a key observable to constrain the size of the photon-emitting region inside the blazar jet. The LST-1 (first prototype of the Large-Sized Telescope) of the CTAO (Cherenkov Telescope Array Observatory) is located on Roque de los Muchachos in La Palma, Spain. With its high sensitivity at low energies (20-150 GeV), it provides a unique opportunity to investigate such phenomena. In 2023, the source had a very bright flare that triggered LST-1 and multi-wavelength data campaigns. In this study, we present the results of this observation campaign, in particular, the search for short-timescale variabilities.

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