



Library Indian Institute of Science Education and Research Mohali



DSpace@IISERMohali (/jspui/)
/ Publications of IISER Mohali (/jspui/handle/123456789/4)
/ Research Articles (/jspui/handle/123456789/9)

Please use this identifier to cite or link to this item: <http://hdl.handle.net/123456789/5095>

Title:	Exploring γ -Ray Flares in the Long-term Light Curves of CTA 102 at GeV Energies
Authors:	Kushwaha, Pankaj (/jspui/browse?type=author&value=Kushwaha%2C+Pankaj)
Keywords:	Exploring γ -Ray Flares Light Curves
Issue Date:	2022
Publisher:	IOP Publishing
Citation:	Astrophysical Journal Supplement Series, 260(2), 48.
Abstract:	<p>Blazar CTA 102 experienced an intense multiwavelength activity phase from 2015 to 2018; in particular, an unprecedented outburst was observed from 2016 October to 2017 February. In this work, we extract a 7 day binned γ-ray light curve from 2008 August to 2018 March in the energy range 0.1–300 GeV and identify three main outbursts. We study in detail the short-timescale variability of these three outbursts via an exponential function with parameterized rise and decay timescales. The obtained shortest rise and decay timescales are 0.70 ± 0.05 hr and 0.79 ± 0.27 hr, respectively. Based on these variability timescales, the physical parameters of the flaring region (e.g., the minimum Doppler factor and the emission region size) are constrained. The short-timescale flares exhibit a symmetric temporal profile within the error bars, implying that the rise and decay timescales are dominated by the light-crossing timescale or by disturbances caused by dense plasma blobs passing through the standing shock front in the jet region. We also find that the best-fitting form of the γ-ray spectra during the flare period is a power law with an exponential cutoff. The derived jet parameters from the spectral behavior and the temporal characteristics of the individual flares suggest that the γ-ray emission region is located upstream of the radio core. The extreme γ-ray flare of CTA 102 is likely to have been caused by magnetic reconnection.</p>
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.3847/1538-4365/ac64f6 (https://doi.org/10.3847/1538-4365/ac64f6) http://hdl.handle.net/123456789/5095 (http://hdl.handle.net/123456789/5095)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

Files in This Item:

File	Description	Size	Format	
Need to add pdf.docx (/jspui/bitstream/123456789/5095/1/Need%20to%20add%20pdf.docx)		9.74 kB	Microsoft Word XML	View/Open (/jspui/bitstream/123456789/5095/1/Need%20to%20add%20pdf.docx)

Show full item record (/jspui/handle/123456789/5095?mode=full)

(/jspui/handle/123456789/5095/statistics)

Items in DSpace are protected by copyright, with all rights reserved, unless otherwise indicated.