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Fermi-LAT GeV Flux Observation of the BL Lacertae Object

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The BL Lacertae object (also known as 1ES 2200+420, TeV J2202+422 and 3FGL J2202.7+4217) is a Blazar type Active Galactic Nucleus (AGNs). Blazars are powerful, Very High Energy (VHE) Gamma-Ray point-light sources. They have relativistic jets pointing along the line of sight of the Earth, and have a highly variable flux from radio to TeV energies. The variability timescale of the flux is an important measurement to identify the location and the size of the emission zone. This paper describes the GeV (1 GeV – 100 GeV) Gamma-Ray flux variability of the BL Lacertae object between 2011 and 2016. The data has been obtained using the Fermi-Large Area Telescope (Fermi-LAT), which is the paramount scientific instrument on the Fermi Gamma-Ray Space Telescope Spacecraft. The daily binned GeV light curve has been obtained using the Fermi-LAT Science Tool and ROOT software. This work discovered one micro flare on 20th June 2015. The maximum and lowest VHE Gamma-Ray daily binned fluxes detected from BL Lacertae are $(1.21\text{E-}07 \pm 3.66\text{E-}08)$ photon $\text{cm}^{-2} \text{s}^{-1}$ and $(9.78\text{E-}09 \pm 9.66\text{E-}09)$ photon $\text{cm}^{-2} \text{s}^{-1}$ respectively. The Mean Fractional Variation (MFV) has been calculated and the obtained value of the MFV is 0.48. This MFV value indicates that the BL Lacertae object has a GeV Gamma-Ray flux that is variable in the daily scale (daily binned).

Key words: Active Galactic Nuclei, Blazars, flux, light curve, variability

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