

Observation of gamma-ray emission from the galaxy M87 above 250 GeV with VERITAS

Contributed by V.A. Acciari and the VERITAS Collaboration
Tuesday, 19 February 2008
Last Updated Thursday, 17 July 2008

The Astrophysical Journal, Volume 679, Issue 1, pp. 397-403.

arXiv: astro-ph/0802.1951

Abstract: The multiwavelength observation of the nearby radio galaxy M87 provides a unique opportunity to study in detail processes occurring in Active Galactic Nuclei from radio waves to TeV gamma-rays. Here we report the detection of gamma-ray emission above 250 GeV from M87 in spring 2007 with the VERITAS atmospheric Cherenkov telescope array and discuss its correlation with the X-ray emission. The gamma-ray emission is measured to be point-like with an intrinsic source radius less than 4.5 arcmin. The differential energy spectrum is fitted well by a power-law function: $d\Phi/dE = (7.4 \pm 1.3_{\text{stat}} \pm 1.5_{\text{sys}}) (E/\text{TeV})^{-2.31 \pm 0.17_{\text{stat}} \pm 0.2_{\text{sys}}} 10^{-9} \text{m}^{-2} \text{s}^{-1} \text{TeV}^{-1}$. We show strong evidence for a year-scale correlation between the gamma-ray flux reported by TeV experiments and the X-ray emission measured by the ASM/RXTE observatory, and discuss the possible short-time-scale variability. These results imply that the gamma-ray emission from M87 is more likely associated with the core of the galaxy than with other bright X-ray features in the jet.