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The search for short-term flares in 10 years of VHE Crab Nebula observations with the Whipple 10m Telescope

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In 1989, the Whipple 10m Telescope achieved the first indisputable detection of a TeV gamma-ray source, the Crab Nebula. Until its decommissioning in 2011, the Whipple Telescope took regular measurements of the nebula. With the recent discovery of GeV gamma-ray flaring activity in the Crab Nebula, it is an opportune time to return to the Whipple Telescope data set and search its extensive archive for evidence of TeV flares. A data set on the Crab Nebula spanning ten years, 2000 - 2010, is compiled and searched for day-scale flaring activity. Using two independent search methods, no evidence for significant flaring activity is found. Monte-Carlo simulations show that low levels of variation on short timescales are difficult to detect. Assuming a flare duration of seven days, 99% confidence level upper limits are calculated for the number of possible 5-fold, 2-fold and 1.5-fold flares in the data set. An upper limit of 0.02 flares per year in the 10-year period is found for the 5-fold flare, and a limit of 0.27 flares per year is placed on the 2-fold flare.

Collaboration

VERITAS

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