A Northern Sky Survey for 100 TeV $\gamma$-ray Source Using the Tibet Air Shower Array and Muon Detector Array

The Tibet ASγ experiment located at 4300 m above sea level, Tibet, China, has a wide field of view and large effective area. It consists of the Tibet air-shower array (Tibet-AS), the air-shower core-detector array (YAC) and the underground water-Cherenkov muon-detector array (Tibet-MD). The Tibet-MD array significantly improves its gamma-ray sensitivity in the 10-1000 TeV energy region by an order of magnitude better than any other previous existing experiments in the world. In this paper we will search the γ-ray sources using data taken from 2014. The result shows the direction to the Crab has the most excess in the number of candidate primary γ rays from 3 TeV to 500 TeV. This is the first detection of the highest energy photons beyond 100 TeV from an astrophysical source, and thus opens up the sub-PeV window in astronomy.

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