

Abstract Submitted
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HAWC Analysis of the Crab Nebula Using Neural-Net Energy Reconstruction¹ SAMUEL MARINELLI, Michigan State University, HAWC COLLABORATION — The HAWC (High-Altitude Water-Cherenkov) experiment is a TeV γ -ray observatory located 4100 m above sea level on the Sierra Negra mountain in Puebla, Mexico. The detector consists of 300 water-filled tanks, each instrumented with 4 photomultiplier tubes that utilize the water-Cherenkov technique to detect atmospheric air showers produced by cosmic γ rays. Construction of HAWC was completed in March, 2015. The experiment's wide field of view (2 sr) and high duty cycle ($> 95\%$) make it a powerful survey instrument sensitive to pulsar wind nebulae, supernova remnants, active galactic nuclei, and other γ -ray sources. The mechanisms of particle acceleration at these sources can be studied by analyzing their energy spectra. To this end, we have developed an event-by-event energy-reconstruction algorithm employing an artificial neural network to estimate energies of primary γ rays. The Crab Nebula, the brightest source of TeV photons, makes an excellent calibration source for this technique. We will present preliminary results from an analysis of the Crab energy spectrum using this new energy-reconstruction method.

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