

Abstract Submitted
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Composition and Energy Resolution with HAWC300¹ ZIGFRIED HAMPEL-ARIAS, University of Wisconsin-Madison, HAWC COLLABORATION² — The High-Altitude Water Cherenkov (HAWC) Observatory is a ground based TeV gamma-ray detector currently being deployed on the slopes of Volcán Sierra Negra in the state of Puebla, Mexico. The HAWC Observatory is an air shower array that will consist of 300 Water Cherenkov Detectors, each equipped with 4 upward-facing photomultiplier tubes, covering a total instrumented area of 22,000 m² at an altitude of 4100 m asl. We will discuss a proposed primary particle and energy estimator that uses the lateral distribution of a given air shower, i.e. the distribution of charge as a function of the distance to the central core of the shower. For a given event hit-pattern on the HAWC array, we use a maximum likelihood approach to identify the most likely mass and energy of the primary particle. The likelihood of hit patterns is calculated using probability tables based on simulated gamma-ray and hadronic showers that trigger the HAWC detector. Prior information, such as the core distribution of triggered events and the relative abundance of protons and gammas, can be taken into account. We will report on the efficiency for identifying the primary particle and the energy resolution of the proposed technique.

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²On behalf of the HAWC Collaboration

Zigfried Hampel-Arias
University of Wisconsin-Madison

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