

First Results from the High-Altitude Water Cherenkov Observatory

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The High-Altitude Water Cherenkov (HAWC) Observatory is designed to observe extensive air showers produced by cosmic rays and gamma rays between 50 GeV and 100 TeV. HAWC is unique among TeV detectors because it can be used to observe air showers from a wide range of arrival directions, enabling us to perform a synoptic survey of the TeV sky. HAWC is also designed to have a high livetime (>90%), making the detector ideal for observations of transient sources such as gamma-ray bursts and flaring active galactic nuclei. While the observatory is only partially built, we have already accumulated one of the largest data sets of TeV air showers ever recorded. Using these data, we have observed a significant anisotropy in the arrival directions of the cosmic rays on angular scales >60 degrees and <20 degrees at the 10^{-3} level. We will discuss the origin of the anisotropy and compare the results to previous observations by other cosmic ray experiments. We will also describe our ongoing program to observe gamma-ray bursts and flares in the TeV band and report current upper limits. Finally, we will discuss prospects for the observation of point-like and diffuse emission of TeV gamma rays when HAWC is completed in 2014.

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