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Mining the Sky for Very High Energy Gamma Rays HARRIS BERNSTEIN, JOHN PRETZ, MIGUEL MOSTAFA, Pennsylvania State Univ — Gamma rays with energies above 100 GeV are detected by the High Altitude Water Cherenkov (HAWC) Observatory. The HAWC Observatory is an array of 300 water Cherenkov detectors. Each detector has four photomultiplier tubes (PMTs) that are used to pinpoint the incoming directions of large air showers originating from the interaction of gamma rays with the Earth's atmosphere. We analyze the impact of parameters that affect the reconstruction of the arrival directions. We vary the calibration parameters and the number of the PMTs used in the reconstruction. We also examine the impact of timing and signal noise. Results show that large changes to the calibrations do not impact significantly the distribution of arrival directions, while changes in the reconstruction parameters may inhibit our ability to identify point sources of very high energy gamma rays. We discuss the results in detail and their implications for further research.

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