

## Study of water Cherenkov detector designs to determine air shower arrival directions with accuracy

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In recent years, a few groups have reported detections of gamma rays in the 100 TeV region from astronomical objects in the Galaxy using extensive air shower arrays. These observations have certainly taken a new step in researching cosmic-ray acceleration mechanisms. They have observed several extended TeV gamma-ray sources in the Galaxy. To study such extended gamma-ray sources, it is crucial to accurately measure the emission region of gamma-rays and investigate the correlation between gamma-ray sources and molecular clouds. Extensive air shower experiments determine the arrival direction of cosmic gamma rays by estimating the shape of the air shower front from the density distribution of detected secondary particles and the detection time. To accurately determine the arrival direction of the air shower, we studied the designs of the water Cherenkov detectors.

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