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Cosmic Ray Astrophysics with The High Altitude Water Cherenkov (HAWC) TeV Gamma Ray Observatory at Mexico

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Content

The High-Altitude Water Cherenkov (HAWC) Observatory is an array of large water Cherenkov detectors sensitive to both gamma rays and hadronic cosmic rays in the energy band between 100 GeV and 100 TeV. HAWC was constructed on Sierra Negra, Puebla, México, at 4100 meters above sea level and began full operation at the end of March 2015. The array consists of 300 water Cherenkov detectors, covering an area of 22,000 m². Each tank is equipped with 4 photomultiplier tubes to detect the Cherenkov radiation produced by charged particles from extended air showers. It has an instantaneous field-of-view of ~ 2 str and continuous operation (24 hours per day). The HAWC Observatory has an improved gamma/hadron efficiency compared to its predecessor Milagro. This makes HAWC an ideal survey instrument working in synergy with other observatories such as AUGER, IceCube, and Air Cherenkov Detectors (IACTs). We give an overview of the HAWC experiment, highlighting recent results from cosmic ray studies, including new full-sky anisotropy maps, as well as ongoing upgrades of HAWC and the installation of “outrigger” detectors that will improve shower reconstruction

Session

Cosmic ray and astroparticle physics

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