4CF17-2017-000026

Abstract for an Invited Paper
for the 4CF17 Meeting of
the American Physical Society

Detecting the Highest Energy Photons from Extreme Astrophysical Sources[1]

BRENDA DINGUS, Los Alamos National Lab

The High Altitude Water Cherenkov (HAWC) gamma-ray observatory detects the highest energy photons from astrophysical sources. HAWC is located at 14000 above sea level near Puebla, Mexico and has been fully operational since March 2015. HAWC observes 2/3 of the sky each day and has produced a map with 40 sources of which about one quarter were previously unknown. The sources detected by HAWC are due to particles accelerated in astrophysical sources to energies much higher than man-made accelerators can produce. These astrophysical particle accelerators include the shocks produced by the remnants of supernovae, the winds powered by rapidly spinning neutron stars, and the relativistic jets emitted from supermassive black holes in distant galaxies. We are also searching HAWC data for new types of high energy gamma-ray sources, such as coincidences with satellite-detected gamma-ray bursts, gravitational-wave detectors, and neutrino observatories. And HAWC observations of dark matter rich objects, such as dwarf spheroidal galaxies, place strong constraints on the annihilation or decay of dark matter into gamma-rays. In this talk, I will give an overview of HAWC and this exciting window on the universe.

[1]For the HAWC collaboration