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## A Preliminary Look at the 4HWC Very-High-Energy Gamma-Ray Source Catalog

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The High Altitude Water Cherenkov (HAWC) observatory is highly suitable for large-scale survey work. The high duty time (95+%), large instantaneous FoV (2 sr), and sensitivity over the 300 GeV to more than 100 TeV energy range make it ideal for creating a catalog of very high energy (VHE) sources. Over the lifetime of the HAWC observatory, 4 catalogs have been produced 3 of which were constructed utilizing the full HAWC energy range while another used a restricted (>56 TeV) range. This talk will focus on the status of the planned 4HWC (full energy range) catalog including the newly developed Multi-Source Fit algorithm inspired by the Fermi Extended Source search method for the galactic plane. Using over 1000 additional days of data, improved event reconstruction algorithms using HAWC's newly completed fifth pass through its dataset, and the improved search algorithm we expect to see a major improvement in the sensitivity and accuracy compared to previous catalogs. The previous full energy range (3HWC) catalog found 65 sources at over 5 sigma and I anticipate the 4HWC search will result in more than 100 significant sources. In addition, the new search is much more suited to fitting extended sources and disentangling more complex regions in the data. While the 3HWC catalog found that 56 out of 65 sources were associated with pulsars it will be of great interest to see how if at all the distribution of source types evolves as a result of the greater sensitivity of the 4HWC catalog. In addition to a discussion surrounding the creation of the 4HWC catalog, I will present a preliminary look at the results of the new catalog search method in several regions of interest in HAWC maps such as the Crab Nebula, Cygnus Cocoon, and near the Geminga pulsar.

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