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## Design and Performance of the HAWC DAQ

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The High Altitude Water Cherenkov (HAWC) Observatory, located on the Sierra Negra plateau (4100m a.s.l.) in central Mexico, is currently under construction and scheduled for completion at the end of summer 2014. The detector is comprised of tightly-packed optically-isolated water tanks, each 5 m tall and 7.3 m in diameter, which are instrumented with 4 Hamamatsu photomultiplier tubes. The tanks are used to detect the secondary charged particles produced when 100 GeV - 100 TeV gamma rays and cosmic rays interact with the atmosphere. Though the detector is under construction, the DAQ has been operating and expanding with the detector as tanks are added. The DAQ is designed to handle a final event trigger rate of >15 kHz with high uptime (>99%) and low latency (<5 s), while also analyzing events with multiple triggers and reconstruction algorithms in real time. This is achieved using a modular system based on inexpensive hardware components and open source technology for transferring data (ZeroMQ). This flexible framework is agnostic to the type of data that is transferred and it could easily be applied to other experiments. We will explain the motivation for this design, describe the DAQ in detail, and present the performance of the detector.

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