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Searching for Q-Balls with the High Altitude Water Cherenkov Observatory PETER KARN, University of California, Irvine, HIGH ALTITUDE WATER CHERENKOV (HAWC) COLLABORATION — The High Altitude Water Cherenkov (HAWC) experiment is a gamma-ray observatory currently under construction at Sierra Negra in Mexico. When complete it will consist of a 20,000 square meter array of 300 water Cherenkov detectors, each with 50,000 gallons of water and four photomultiplier tubes. Although HAWC is designed to study gamma rays from galactic and extra-galactic sources, the large volume of instrumented water gives the opportunity to search for more exotic species. One such target, predicted by several varieties of supersymmetric theory, is the Q-ball. Q-balls are large, subrelativistic particles that can have a large baryon number and can be stable since their creation in the early universe. They are also a very appealing candidate for the dark matter of the universe, but their large masses must mean the flux is very low. HAWC has a flexible data acquisition system which, with a specialized trigger algorithm for non-relativistic species, allows a search for Q-balls traversing the detector.

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