

The University of Iowa

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The purpose of our summer research was to run tests on equipment for the CMS upgrade and a teacher institute. We were involved in four projects: spectrometer testing of glass specimens, helium afterpulse PMT tests, directional particle detector and a gobstopper collider simulator. The spectrometer testing ran transmission and absorption tests on quartz and glass pieces that were destined for a radiation beam. After exposure to radiation, the specimens would be re-tested to determine what wavelengths of light are affected by the exposure. We also took one of our new photomultiplier tubes and tested it for afterpulses after exposure to helium gas. The helium gas simulates years of air leakage into the vacuum area of the tubes. This project needed to be continued after we left. Two of our students built a detector from a large PMT and a plastic block. We exposed this to cosmic rays while upright and inverted. We did not detect a significant difference in signals. Our students also built a hard candy collider for each of our teachers in their teacher institute. The teachers could then collide these jawbreaker-type candies and display the randomness of colliding particles to their students.