Abstract Submitted
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Crystal Ball Functional Model[1] DAVID PLOTNICK, The George Washington University — The A2 collaboration of the MAinz MIkrotron is dedicated to studying meson production and nucleon structure and behavior via photon scattering. The photons are made via bremsstrahlung process and energy-tagged using the Glasgow Photon tagger. The photon beam then interacts in a variety of targets: cryogenic, polarized or solid state, and scattered particles deposit their energy within the NaI crystals. Scintillators are able to give results on particles energy and time. Events are reconstructed by combining information from the Tagging spectrometer, the Crystal Ball detector, the TAPS forward wall spectrometer, a Cherenkov detector, and multi-wire proportional chambers. To better understand the detector and experimental events, a live display was built to show energies deposited in crystals in real-time. In order to show a range of energies and particles, addressable LEDs that are individually programmable were used. To best replicate the Crystal Ball, 3D printing technology was employed to build a similar highly segmented icosahedron that can hold each LED, creating a 3D representation of what photons see during experiments. The LEDs were controlled via Arduino microcontroller. Finally, we implemented the Experimental Physics and Industrial Control System to grab live event data, and a simple program converts this data in to color and crystal number data that is able to communicate with the Arduino. Using these simple parts, we can better visualize and understand the tools used in nuclear physics.

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