

Gain Calibration of the Barrel Calorimeter in the GlueX Experiment

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The GlueX experiment was built to produce and observe the spectrum of exotic hybrid meson states using a 9 GeV linearly polarized photon beam incident on a proton target. In order to achieve this goal GlueX uses electromagnetic calorimeters to detect neutral particles. There are two calorimeters, a barrel electromagnetic calorimeter that offers a polar angular coverage from 11° to 126° and a forward electromagnetic calorimeter that offers angular coverage from 2° to 11° . Gain calibration of the calorimeters is important to improve the reconstructed energy resolution of neutral particles and allows for better detection of physics signals. To do the calibration we reconstruct a sample of π^0 events by detecting their decay photons in the calorimeters. The width of the π^0 sample is minimized by adjusting the gains on each of the readout channels. The energy resolution for both GlueX calorimeters has significantly improved after doing the gain calibration procedure. As a result of calibrating the gains using our first set of beam data we have been able use the calorimeters to detect several early physics signals. The calorimeters calibration techniques and early physics results are presented and discussed.