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Beam Test Results of the GlueX Forward Calorimeter KEVIN BAUER, KEI MORIYA, MATTHEW SHEPHERD, Indiana University, GLUEX COLLABORATION — GlueX is an experiment to begin running in the near future at Jefferson Lab. Our research group is responsible for the forward calorimeter (FCAL) that is designed to measure the energy of photons produced from the decays of mesons. Recently, we conducted a beam test at Jefferson Lab using a prototype of the FCAL. Its goal was to experimentally verify the energy resolution of the FCAL as a function of beam energy. The prototype was tested with recoil electrons ranging in energy from 113MeV to 277MeV. We obtained the resolution by comparing the reconstructed energy to the known energy. In addition, we corrected our measured resolution for multiple scattering and energy loss based on a GEANT4 simulation of the prototype. Another important goal of the beam test was to measure the timing resolution of the channels on our flash analog to digital converters (fADCs). For GlueX, we need to require the timing resolution to be much less than the bunch spacing (2ns). The results of our studies indicate that the energy resolution of the FCAL is consistent with our predictions. We also found the timing resolution as a function of signal size and the results agreed with a similar study. For signals of about at least 75mV, the timing resolution achieved was significantly lower than 2ns.

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