Performance of the $PbWO_4$ Hybrid Electromagnetic Calorimeter at Jefferson Laboratory

The PrimEx experiment at Jefferson Lab proposes to perform a high precision measurement of the π^0 lifetime via the Primakoff effect. The initial data-taking phase has recently been completed. A new electromagnetic hybrid calorimeter (HYCAL) consisting of 1152 lead tungstate ($PbWO_4$) crystals and 573 lead glass Cherenkov modules was constructed by the collaboration to conduct the lifetime measurement with a precision of 1.5%. This novel electromagnetic calorimeter has high resolution, acceptance, and efficiency, characteristics that are required for the detection of the π^0 decay photons. The HYCAL has been tested with few GeV photon beams. Results for the energy and position resolutions for both $PbWO_4$ and Pb-glass, including the transition regions, will be presented.

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