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Photomultiplier gain versus high voltage measurements for the SuperBigBite spectrometer electronic calorimeter. WILLIAM SHAVER, GABRIEL NICULESCU, James Madison University — A number of crucial experiments exploring the intricate tomography of protons and neutrons will be carried out in Hall A at Jefferson Lab using the SuperBigBite Spectrometer (SBS), a large acceptance magnetic spectrometer sporting 0.5% momentum and 0.5 mr angular resolution. As part of the standard SBS detector package the electromagnetic calorimeter ECAL will detect electrons and photons in the 5 GeV energy range. ECAL's readout will be carried out by ~3,000 28 mm FEU84 photomultiplier (PMT) tubes. In order to characterize these tubes the PMT gain and relative quantum efficiency were measured as a function of high voltage in the 1100-1500 V range, as was the afterpulsing probability. A test stand and a set of complex computer algorithms that almost completely automate the testing procedure and (Root/C++-based) data analysis were developed. The custom-built GUI that governs the whole testing procedure as well as the gain dependence on the high voltage will be presented.

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