

Abstract Submitted  
for the APR15 Meeting of  
The American Physical Society

**Monte Carlo Study of Electromagnetic Calorimeter Performance for Proton Form Factor Measurements at JLab** RICHARD OBRECHT, ANDREW PUCKETT, Univ of Connecticut - Storrs, SUPER BIGBITE SPECTROMETER COLLABORATION — Jefferson Lab’s continuous electron beam, capable of luminosities approaching  $10^{39} \text{ cm}^{-2} \text{ s}^{-1}$ , has recently been upgraded to a maximum energy of 12 GeV, allowing the proton electromagnetic form factor ratio  $G_E^p/G_M^p$  to be measured at momentum transfer  $Q^2$  of up to  $12 \text{ GeV}^2$  via the polarization transfer method. The measurement will use the Super BigBite Spectrometer (SBS), a new magnetic spectrometer capable of operating at forward scattering angles under high luminosity conditions, to detect and measure the polarization of elastically scattered protons. The measurement of  $G_E^p/G_M^p$  also requires detection of the elastically scattered electron in coincidence using a lead-glass electromagnetic calorimeter (ECal). ECal, the subject of this talk, is based on the “BigCal” detector used in a predecessor experiment in Hall C, re-configured to match the acceptance of SBS for elastically scattered protons. This talk will present an overview of ECal, its role in the measurement of GEp at large  $Q^2$ , and the technical challenges involved in its operation in the high-radiation environment of Hall A, followed by the results of of detailed GEANT4-based Monte Carlo simulations characterizing its expected performance under experimental conditions.

Andrew Puckett  
Univ of Connecticut - Storrs

Date submitted: 12 Jan 2015

Electronic form version 1.4