Abstract Submitted
for the APR18 Meeting of
The American Physical Society

High Resolution Spectrometer (HRS) Detector Efficiency in GM_P Experiment (E12-07-108) at JLab BASHAR ALJAWRNEH, North Carolina AT State Univ, ABDELLAH AHMIDOUCH, North Carolina AT State University, BOGDAN WOJTSEKHOWSKI, Jefferson Lab, BARAK SCHMOOKLER, Massachusetts Institute of Technology, ERIC. CHRISTY, THIR GAITAM, Hampton University, LONGWU OU, Massachusetts Institute of Technology, YANG WANG, College of William Mary — The GM_p experiment in Hall A at JLab is the first experiment to complete the data collection after the CEBAF 12 GeV upgrade. The goal of the experiment is to make a precise measurement of the elastic proton cross section at high Q^2 to probe the internal structure of the proton. As the GM_p experiment requires a good control of all systematic uncertainties, several novel techniques were developed to accurately extract detector efficiencies for the new standard Hall A detector stack. The latter consists of two HRS spectrometers which are almost identical in architecture and operation. Each spectrometer is comprised of two scintillator detectors for triggering and cosmic suppression, three chambers for tracking, a gas Cherenkov detector and a lead-glass calorimeter for particle identification. Individual scintillator efficiencies and combined trigger efficiency were extracted. In addition, off-line electron cut efficiencies in the gas Cherenkov and calorimeter detectors were studied to limit any potential pion and other contaminations. Lastly, calculations of the computer and electronic live-times were determined for all collected data.

Bashar Aljawrneh
North Carolina A
T State Univ

Date submitted: 14 Jan 2018 Electronic form version 1.4