Abstract Submitted
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Mott Polarimeter Upgrade at Jefferson Lab M. MCHUGH, A.K. OPPER, The George Washington University, J. GRAMES, M. POELKER, R. SULEIMAN, Thomas Jefferson National Accelerator Facility, C. HOROWITZ, Indiana University, S. RHODES, Lycoming College, X. ROCA MAZA, Universita degli Studi di Milano and INFN, C. SINCLAIR, Cornell University — A Mott polarimeter with a design optimized for 5.5 MeV/c has been in routine use at the CEBAF accelerator for well over a decade, providing polarization measurements approaching 1% accuracy. Measurements with different target elements (Au, Ag, Cu) over decades of target thicknesses (100 – 10,000 angstroms), and beam energies between 2 and 8 MeV allow us to determine the effective analyzing power with a high degree of certainty. Recent and planned improvements in our polarimeter configuration, detectors and data acquisition system, coupled with a low 31 MHz repetition rate beam allow us to distinguish and suppress electrons that do not originate from the target foil. This work coupled with a significant effort to produce a detailed GEANT4 model of the polarimeter is part of an effort to determine systematic uncertainties at the level of the theoretically calculated analyzing power. We describe our activities and a series of planned measurements that will allow us to demonstrate and possibly improve the precision and accuracy of polarization measurements at JLab, as required for future parity violation experiments.

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