Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Science opportunities with a New Neutral Particle Spectrometer and a compact High Intensity Photon Source at Jefferson Lab[1] TANJA HORN, Catholic Univ of America — The two-arm combination of a high-resolution neutral-particle spectrometer (NPS) and a magnetic spectrometer offers unique scientific capabilities to push the energy scale for studies of the transverse spatial and momentum structure of the nucleon. It enables precision measurements of the DVCS cross section at different beam energies to extract the real part of the Compton form factor and of the semi-inclusive neutral-pion cross section to validate QCD factorization. It allows measurements to push the energy scale of real Compton scattering, the process of choice to explore factorization in a whole class of wide-angle processes, and its extension to neutral pion photo-production. The combination of high precision calorimetry with NPS and a novel compact high intensity photon sources greatly enhances scientific benefit to exclusive processes like wide-angle and time-like Compton scattering with transverse polarized targets. It offers a gain in scientific production of a factor of 30 as compared to existing techniques. A similar compact high-intensity photon source technique would allow a gain of two decades to produce a KL beam, which would open new avenues for hadron spectroscopy. We describe the science program enabled by the NPS and a novel compact high intensity photon source

[1]Supported in part by NSF grants PHY1306227 and PHY1306418

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Date submitted: 30 Jun 2017 Electronic form version 1.4