Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Source for Compton Scattering from Solid Polarized Targets[1]
TANJA HORN, The Catholic University of America, DONAL DAY, University of Virginia, ROLF ENT, Jefferson Lab, DAVID HAMILTON, University of Glasgow, DUSTIN KELLER, University of Virginia, GABRIEL NICULESCU, James Madison University, BOGDAN WOJTSEKHOWSKI, Jefferson Lab, JIXIE ZHANG, University of Virginia, NEUTRAL PARTICLE SPECTROMETER COLLABORATION COLLABORATION — Wide angle Compton scattering (WACS) from polarized protons holds great promise: access to the generalized parton distribution functions $\tilde{H}$ and E with different weighting and moments than in other hard exclusive processes, emphasizing the u-quarks and the valence region. Previously, experiments were proposed using bremsstrahlung from polarized electrons striking a radiator. Unfortunately, the mixed electron-γ beam limits the polarized target performance due to radiation damage and restricted luminosity owing to the heat load. We will present the technical design concept of a compact, high intensity photon source (CPS) to be used with dynamically nuclear polarized targets. The novel CPS technique opens access to physics processes with very small scattering probabilities, not possible with currently existing facilities. Capable of producing 10^{12} equivalent γ/sec, the CPS will result in a large gain in polarized experiment figure-of-merit (by a factor of ~ 30). Compared to a traditional bremsstrahlung photon source the CPS will present several advantages, including much lower radiation levels, both prompt and post-operational due to the beam line elements radio-activation.

[1]Supported in part by NSF PHY-1714133

Tanja Horn
The Catholic University of America

Date submitted: 01 Jul 2019 Electronic form version 1.4