

Abstract Submitted  
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**Impulse Approximation in Inelastic Compton Scattering on The Deuteron and Neutron Polarizabilities** BERHAN DEMISSIE, The George Washington University — Inelastic Compton scattering on the deuteron,  $\gamma d \rightarrow \gamma np$ , is analysed in  $\chi$ EFT - a consistent model independent framework with controlled uncertainties. By doing so the applicability of  $\chi$ EFT is extended beyond elastic Compton scattering on the deuteron. In addition, neutron polarizability values are extracted by investigating the kinematic region of NQFP, neutron quasi-free peak, where the momentum of the outgoing proton is so small that it is considered static. This region provides access to  $\gamma n \rightarrow \gamma n$  which leads to a more direct approach of computing neutron scalar polarizabilities  $\alpha$  and  $\beta$ . To this end, current results from Impulse approximation calculation are reported. These calculations pertain to the case where incoming photon interacts with only one of the nucleon in the deuteron. The impulse approximation differential cross section  $d^3\sigma/dE_n d\Omega_{\gamma'} d\Omega_n$  for photon energies ranging from 100-400MeV is presented.

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