Abstract Submitted
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Scalar and Spin-Polarisabilities of the Nucleon from Deuteron Compton Scattering[1] H.W. GRIESSHAMMER, D. SHUKLA, George Washington University, J.A. MCGOVERN, University of Manchester, UK, D.R. PHILLIPS, Ohio University — We present progress in elastic deuteron Compton scattering in Chiral Effective Field Theory. Including the $\Delta(1232)$ as explicit degrees of freedom is particularly improtant for deuteron Compton scattering at $\gtrsim 90$ MeV as measured at SAL and MAXlab. Consistency arguments dictate including the np-rescattering states and automatically render the correct Thomson limit, shedding new light on Weinberg's power-counting of nuclear forces. We show that the static electric and magnetic scalar polarisabilities of the proton and neutron are identical within the accuracy of available data. In view of proposals at HIγS and ongoing effort at MAXlab, we address in detail single- and doubly-polarised observables with linearly or circularly polarised photons on both un- and vector-polarised deuterons. Several observables can be used to extract not only spin-independent nucleon polarisabilities, but also the so-far practically un-determined spin-dependent polarisabilities which parameterise the stiffness of the nucleon spin in external electro-magnetic fields. Amongst the questions addressed are: convergence of the expansion when including the Δ, the rôle of np-rescattering, and sensitivity to the deuteron wave function.

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