

Abstract Submitted
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Nucleon Polarisabilities from Few-Nucleon Systems: An Update¹

HARALD W. GRIESSHAMMER, George Washington Univ — Low-energy Compton scattering probes the nucleon's two-photon response to electric and magnetic fields at fixed photon frequency and multipolarity. It tests the symmetries and strengths of the interactions between constituents, and with photons. For convenience, this energy-dependent information is often compressed into the two scalar dipole polarisabilities α_{E1} and β_{M1} at zero photon energy. These are fundamental quantities, and important for the proton charge radius puzzle and the Lamb shift of muonic hydrogen. Combined with emerging lattice QCD computations, they provide stringent tests for our understanding of hadron structure. This talk reports new results for elastic Compton scattering from the deuteron in Chiral Effective Field Theory with an explicit $\Delta(1232)$ degree of freedom (χ EFT). These extend the previous formulation to one higher order in the chiral counting, reducing the residual theoretical uncertainties from about 5% to 1%. Advantage of the numerical power of modern few-nucleon methods.

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Harald Griesshammer
George Washington Univ

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