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Nucleon polarizabilities

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The scalar and spin electromagnetic polarisabilities of the proton and neutron are still not particularly well determined by Compton scattering experiments, with uncertainties ranging from somewhat less than 10% to over 100%. In the absence of free neutron targets, neutron properties must be extracted from light nuclei, particularly the deuteron and ^3He , but that requires a good understanding of the contribution of nuclear effects and two-body currents which substantially modify the cross sections.

Chiral effective field theory provides a unified framework for the analysis of the low-energy properties of both nucleons and light nuclei. World Compton scattering data has been used to give good constraints on the proton scalar polarisabilities α and β [1], with progress also being made on the spin polarisabilities [2] and prospects from a new generation of polarised scattering experiments [3, 4]. Progress is also being made on the theoretical and experimental front for Compton scattering from light nuclei [5, 6] and experiments are planned at both MAMI and HIgS. In this talk I will review progress in the field, and talk about future plans.

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