The GDH Experiment at ELSA

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Abstract

The Gerasimov-Drell-Hearn (GDH) sum rule connects the helicity dependent photoabsorption cross sections $\sigma_{3/2}$ and $\sigma_{1/2}$, which are observables of the dynamics of the excitation spectrum, with static properties of the nucleon like the anomalous magnetic moment *kappa* and the nucleon mass m.

To check this fundamental sum rule experimentally the measurement of total photo absorption cross sections of circularly polarized real photons on longitudinally polarized nucleons has been performed. For the proton this has been carried out in the photon energy range from 200 up to 800 MeV at MAMI in 1998. We continue these measurements at the Bonn accelerator facility ELSA from 680 MeV up to a photon energy of 3100 MeV.

First results of the MAMI measurements off the proton have been published [1, 2]. The doubly polarized data taking at ELSA is in progress. In this talk first preliminary results of our proton measurements at ELSA will be shown.

1. GDH-Collaboration, J. Ahrens et al., Phys. Rev. Lett. 84, 5950 (2000).
2. GDH-Collaboration, J. Ahrens et al., submitted to Phys. Rev. Lett. (2001).