

Low Q^2 Measurements of the Neutron and ^3He Spin Structure

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Abstract

Originally derived for real photon absorption, the Gerasimov-Drell-Hearn (GDH) sum rule was first extended to non-zero Q^2 in 1989. The extension of the sum rule provides a unique relation, valid at any Q^2 , that can be used to experimentally or theoretically study the nucleon spin structure. Jefferson Lab experiment E97-110 performed a precise measurement of the Q^2 dependence of the extended GDH integral and of the moments of the neutron and ^3He spin structure functions between 0.02 and 0.3 GeV^2 . This Q^2 range will allow us to test predictions of Chiral Perturbation Theory, and check the GDH sum rule by extrapolating the integral to the real photon point. This measurement also provides a better understanding of the nucleon resonances. The data have been taken in Hall A using the Jefferson Lab high polarization continuous electron beam and a polarized ^3He target. The status of the data analysis will be discussed, and preliminary results will be shown.