

The Proton Spin-Dependent Structure Function, g_2 , at Low Q^2

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Abstract

The Jefferson Laboratory accelerator has been used to great effect in the study of the polarized structure of nucleons. Measurements of the spin-dependent structure functions have been proven to be powerful tools in testing the validity of effective theories of Quantum Chromodynamics. While the neutron spin structure functions, g_1^n and g_2^n , and the longitudinal proton spin structure function, g_1^p , have been measured over a wide kinematic range, the second proton spin structure function, g_2^p , has not. This talk will present the E08-027 (g2p) experiment, which was an inclusive measurement of g_2^p in the resonance region at Jefferson Lab's Hall A. This is the first measurement of g_2^p covering $0.02 \text{ GeV}^2 < Q^2 < 0.2 \text{ GeV}^2$. The experiment will allow us to test the Burkhardt-Cottingham Sum Rule at low Q^2 as well as extract the longitudinal-transverse generalized spin polarizability and compare it to predictions made by Chiral Perturbation Theory. In addition, the data will reduce the systematic uncertainty of calculations of the hyperfine splitting of hydrogen. An update on the status of the analysis, along with preliminary results, will be presented.