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The Generalized GDH Sum Rule: Measuring the Spin Structure of ^3He and the Neutron using Nearly Real Photons JAIDEEP SINGH, University of Virginia, JEFFERSON LAB HALL A COLLABORATION — The generalized Gerasimov-Drell-Hearn (GDH) sum rule is a versatile and important tool for studying nucleon spin structure over the entire Q^2 range. Originally derived for real photon absorption ($Q^2=0$), the GDH sum rule has been extended to non-zero Q^2 . The goals of Jefferson Lab experiment E97-110 are to measure the Q^2 dependence of the generalized GDH integral between 0.02 and 0.3 $(\text{GeV}/c)^2$, to study its slope near $Q^2 = 0$, and to extrapolate to the real photon point for the neutron and ^3He . In this low Q^2 domain, such measurements serve to test Chiral Perturbation Theory and probe its limits of applicability. Our measurement will also provide new constraints on understanding the neutron and ^3He spin structure and a better understanding of the effect of nucleon resonances. The experiment utilized the highly polarized electron beam and polarized ^3He target at Jefferson Lab. Preliminary results will be presented.

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