

The GDH Sum Rule and the Spin Structure of ${}^3\text{He}$ and the Neutron
using Nearly Real Photons

Vincent Sulkosky
College of William and Mary
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Abstract

To fulfill my Ph. D. requirements at William and Mary, I have been working with the polarized ${}^3\text{He}$ target group at Jefferson Lab. The experiment that I am working on, E97-110, will study the Gerasimov-Drell-Hearn (GDH) sum rule for the neutron at low Q^2 . The measured quantities from the experiment will allow us to study and understand the neutron spin structure and the GDH sum rule. During the experiment, we will use the Hall A spectrometers with two additional septum magnets that will allow us to achieve a minimum angle of 6° . In preparation for this experiment, I have taken shifts on the two polarized ${}^3\text{He}$ experiments that ran this summer in Hall A and have measured the ${}^3\text{He}$ density and wall thickness of various cells. During the next year, I will become a target expert for the ${}^3\text{He}$ group and become familiar with the Hall A spectrometers including the new septum magnets.