Abstract Submitted
for the APR10 Meeting of
The American Physical Society

A Precision Measurement of Neutron d2 MATTHEW POSIK, Temple University, THE JEFFERSON LAB E06014 COLLABORATION — The asymmetries $A_\perp$ and $A_\parallel$ as well as the absolute cross section σ_0 for polarized ^3He, were measured in the deep inelastic quark region, $0.2 \leq x \leq 0.7$ and $2 \leq Q^2 \leq 6GeV^2$, to access information on the neutron. The experiment was preformed at Jefferson Laboratory located in Newport News, Va. From these asymmetries and absolute cross sections, the spin structure functions g_1 and g_2 will be extracted. Using the spin structure functions the higher twist matrix element d_2^n will then be evaluated. The quantity d_2^n is a probe into quark-gluon correlations, and currently[1] can be thought of effectively as the averaged Lorentz color force acting on the quarks just after they are struck by a virtual photon. Alternatively it was suggested earlier[2],that the gluon field and nucleon polarization interactions lead to effective magnetic and electric color polarizabilities χ_B and χ_E. The matrix element d_2^n can be expressed as a linear combination of the electric and magnetic color polarizabilites, which can be calculated using Lattice QCD.

[1]Matthias Burkardt. Parton Distributions in the Impact Parameter Space. 2009.
[2]B.W. Filippone and Xiangdong Ji. The spin structure of the nucleon. ADV.NUCL.PHYS.,26:1,2001.1

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Date submitted: 19 Oct 2009 Electronic form version 1.4