

Abstract Submitted  
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**Precision Measurement of the Neutron  $d_2$ : A Probe of the Color Force** MATTHEW POSIK, Temple University, E06-014 COLLABORATION, HALLA COLLABORATION — The  $g_2$  nucleon spin-dependent structure function measured in electron deep inelastic scattering contains information beyond the simple parton model description of the nucleon. It provides insight into quark-gluon correlations and a path to access the confining local color force a struck quark experiences just as it is hit by the virtual photon due to the remnant di-quark. The quantity  $d_2$ , a measure of this local color force, has its information encoded in an  $x^2$  weighted integral of a linear combination of spin structure functions  $g_1$  and  $g_2$  and thus is dominated by the valence-quark region at large momentum fraction  $x$ . To date, theoretical calculations and experimental measurements of the neutron  $d_2$  differ by about two standard deviations. Therefore, JLab experiment E06-014, performed in Hall A, made a precision measurement of this quantity. Double spin asymmetries and absolute cross-sections were measured in both DIS and resonance regions by scattering longitudinally polarized electrons at beam energies of 4.74 and 5.89 GeV from a longitudinally and transversely polarized  $^3\text{He}$  target. Results for the absolute cross-sections and spin structure functions on  $^3\text{He}$  will be presented as well as results for the neutron  $d_2$ .

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