

Abstract Submitted
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**Probing Nucleon Spin Structure with Deep Inelastic Scattering:
Neutron g_2 and d_2** ¹ MURCHHANA ROY, WOLFGANG KORSCH, University
of Kentucky, E12-06-121 AND E12-06-110 COLLABORATION — The experiment
E12-06-121 at Jefferson Lab aims to do a precision measurement of the neutron spin
structure function g_2 using the deep inelastic scattering of electrons over the kinematic
range $0.20 < x_{Bj} < 0.95$ and $2.5 < Q^2 < 6.0$ (GeV/c)². The large kinematic
coverage will allow for the precision determination of d_2 , the third moment of the
linear combination of the spin structure functions g_1 and g_2 . As one of the cleanest
higher twist observables, g_2 contains information on quark-gluon correlations and
 d_2 is connected to the “color polarizability” of the nucleon. The experiment will be
performed in Hall C using a longitudinally polarized about 11 GeV electron beam
and polarized helium-3 target. The combination of Super High Momentum Spec-
trometer (SHMS) and High Momentum Spectrometer (HMS) will allow us to run
the experiment for four truly constant Q^2 values over a wide range of x_{Bj} for the
first time. Physics will be explored to test several existing theoretical predictions
including Lattice QCD. An overview (the present status) of the experiment will be
presented.

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