Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Exploring the Spin Structure of the Neutron by the Measurement of 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 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 was performed and successfully completed in Hall C using a longitudinally polarized 10.4 GeV electron beam and a polarized helium-3 gas target. The combination of Super High Momentum Spectrometer (SHMS) and High Momentum Spectrometer (HMS) allowed us to run the experiment for three constant Q^2 values over a wide range of x_{Bj} for the first time. The extraction of $d_2^n(Q^2)$ will serve as a benchmark to the predictions from Lattice QCD. An overview of the experiment and the present status of the experimental data analysis will be presented.

[1]This work is partially supported by the U.S. Department of Energy Office of Nuclear Physics under Contract No. DEFG02-99ER41101.

Murchhana Roy
University of Kentucky

Date submitted: 07 Jan 2021 Electronic form version 1.4