Probing Quark-Gluon Correlations in the Neutron: Precision Measurements of d_2^n and g_2^n

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The spin structure function g_2 and the higher twist reduced matrix element d_2 are fundamentally coupled to the quark-gluon interactions and transverse momentum of the quarks in the nucleon.

This talk will outline two Jefferson Lab measurements of the spin structure function g_2 and the higher twist reduced matrix element d_2 on the neutron. The first, E06-014, completed its run in March 2009 and will reduce the uncertainty on the neutron d_2 by a projected factor of four. The second experiment to be described, E12-06-121, is targeted to run shortly after the JLab 12 GeV upgrade is completed and will focus on precision measurements of g_2^n over the region $0.2 < x < 0.95$ and $2.5 < Q^2 < 6\,\mathrm{GeV}^2/c^2$.