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Parity-violating deep inelastic scattering with SoLID at Jefferson Lab SEAMUS RIORDAN, University of Massachusetts, Amherst, SOLID COLLABORATION — Deep inelastic electron scattering has been an invaluable tool in understanding the internal structure of the nucleon and has provided motivation for the standard model of quarks and the concept of asymptotic freedom. When coupled with parity-violating measurements through the interference of a virtual photon and weakly interacting Z boson, new linear combinations of quarks are probed which can provide information which is complementary to the standard electromagnetic interactions. Precision measurements on deuterium allows for novel tests of the standard model, possible observations of quark-level charge symmetry violation, and the study of specific higher-twist effects. Additionally, measurements on a proton target can provide a precise extraction of the parton ratio d/u as the scaling variable $x \to 1$. Separate experiments have also been approved to measure transverse momentum distributions over a broad kinematic range and J/ψ production cross sections at threshold. Presented will be the approved experimental program at Thomas Jefferson National Accelerator Facility using the Solenoidal Large Intensity Device (SoLID).

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