

**PR-05-007 - *Polarized  $e$ - $2H$  parity violating deep inelastic scattering at CEBAF 6 GeV***

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This proposal to measure parity-violating deep inelastic scattering from the deuteron is devoted to the most important topic in modern physics - the search for the new particles beyond the Standard Model (SM). The role of low-energy facilities, such as JLab, in this search is to find violations of the SM by precise measurements of the amplitudes of selected processes which are sensitive to possible contributions of virtual heavy new particles. One such experiment is a measurement of  $Q_{\text{weak}}$ ; this experiment may be regarded as complementary since it addresses a product of weak and electromagnetic coupling constants not accessible in the  $Q_{\text{weak}}$  experiment. With the proposed accuracy, the estimates of masses of relevant new particles (such as new gauge bosons or leptoquarks) are around 1-2 TeV which is well within the range of the new physics predicted by some models such as supersymmetric extensions of the SM. If violations of the SM are not detected, it will place a new, stricter bound on the set of parameters of the possible models.

My only concern is that at low energies the QCD higher-twist effects may be very important. This question is addressed by the proposal, but the fact remains that at present there are no reliable estimates of the higher-twist effects besides the common belief (based on various models) that they should be around 1% for the asymmetries that are ratios of the amplitudes.