

Parity Violation Inelastic Scattering Experiments at JLab

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We report on the measurement of parity-violating (PV) asymmetries in the deep inelastic scattering (DIS) and nucleon resonance regions using inclusive scattering of longitudinally polarized electrons off an unpolarized deuterium target. The effective weak couplings C_{2q} are accessible through the DIS measurements. Here we report a measurement of the PV asymmetry, which yields a determination of $2C_{2u} - C_{2d}$ with an improved precision of a factor of five relative to previous results. These results indicate evidence with 95% confidence that the $2C_{2u} - C_{2d}$ is non-zero. This experiment also provides the first parity-violation data covering the whole resonance region, which provide constraints on nucleon resonance models. Finally, the program to measure PV-DIS at JLab in the 12 GeV era will be discussed using the Solenoidal Large Intensity Device (SoLID).

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