

Sub-percent Precision Polarimetry in Experimental Hall C

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Modern electron scattering experiments, and in particular those utilizing parity-violating electron scattering, require precise knowledge of electron beam polarization. Recently at Jefferson Lab Hall C, sub-percent beam polarization determination was achieved during the Q-weak experiment using two independent polarimeters. The Hall C Moller uses a pure iron foil that is driven into magnetic saturation out-of-plane by a high (3.5 T) field superconducting solenoid. A Compton polarimeter was installed in 2010 which uses a 532 nm VERDI laser. Both recoil electron and backscattered photon are detected enabling a semi-independent determination of beam polarization. Results from the Q-weak Run 2 period shows both Moller and Compton electron detector achieved sub-percent precision, and agree to within 0.7%. An independent Moller-Compton cross-calibration was also performed. This talk will introduce both Hall C polarimeters, their systematics, and the cross-calibration results, using Q-weak's 2nd run period as an example.

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