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A Double scattering polarimeter for the P2 experiment at MESA

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The P2 Experiment at the new Mainz Energy-recovering Superconducting Accelerator (MESA) aims at measuring the weak mixing angle $\sin^2 \theta_W$ at low Q^2 with high precision. Therefore the polarization of the incident electron beam has to be known with a very high accuracy ($< 0.5\%$). Conventional Mott polarimeters are limited by uncertainties in the extrapolation and theoretical calculations required to determine S eff.

The Double Scattering (Mott-) Polarimeter (DSP) presented in this talk offers an alternative method for the calibration of the target foils by using double Mott scattering, allowing a high precision in the determination of the effective analyzing power of the scattering process by only relying on asymmetry measurements on two target foils. First results that were achieved with 100 keV beam energy, the injection energy of MESA, are presented.

Summary

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