

High Energy Physics - Experiment

Leading-Order Determination of the Gluon Polarization from high- p_T Hadron Electroproduction

The [HERMES Collaboration](#) (A. Airapetian et al.)

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Longitudinal double-spin asymmetries of charged hadrons with high transverse momentum p_T have been measured in electroproduction using the HERMES detector at HERA. Processes involving gluons in the nucleon have been enhanced relative to others by selecting hadrons with p_T typically above 1 GeV. In this kinematic domain the gluon polarization has been extracted in leading order making use of the model embedded in the Monte Carlo Generator PYTHIA 6.2. The gluon polarization obtained from single inclusive hadrons in the p_T range 1 GeV $< p_T < 2.5$ GeV using a deuterium target is $\Delta g/g(x) = 0.049 \pm 0.034$ (stat) ± 0.010 (sys) $\exp^{+0.126}_{-0.099}$ (models) at a scale $|\mu^2| = 1.35$ (GeV) 2 and $\langle x \rangle = 0.22$. For different final states and kinematic domains, consistent values of $\Delta g/g$ have been found within statistical uncertainties using hydrogen and deuterium targets.

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