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Impact of parity-violating deep-inelastic scattering on the nucleon strangeness and weak mixing angle

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At present, there is a lack of experimental data constraining the dependence of the strange nucleon parton distribution functions (PDFs) on the parton momentum fraction and the electroweak mixing angle at low- Q^2 . The parity-violating asymmetry from the neutral-current deep inelastic scattering of electrons from proton and deuterium targets, which will be measured by the proposed SoLID experiment at Jefferson Lab, possesses a known sensitivity to both the strange PDFs and electroweak parameters. In this work we explore this sensitivity and perform a new global analysis, incorporating pseudo-data from simulations based on SoLID experimental projections with radiative corrections to the asymmetry, for the unpolarized PDFs and the weak-mixing angle. We find a sizable constraining power of future A_{PV} data on the high- x behavior of the nucleon strangeness and a substantial resolving power on the weak-mixing angle at low- Q^2 .

Would you be interested in giving a 5-minutes flash talk?

Yes

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