Polarized and unpolarized PDF's

QCD analysis on DIS data

Ali

[1]Physics Department of Semnan university, Semnan, Iran

[2]School of Particles and Accelerators, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran

[3]Stanford Institute for Theoretical Physics, Stanford University, Stanford, CA, USA

Department of Physics, Southern Methodist University

Outline

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- Spin is a fundamental degree of freedom originated from the space-time symmetry.
- Spin plays a critical role in determining the basic structure of fundamental interactions.
- Test of a theory is not complete without a full test of spin-dependent decays and scattering.
- Spin provides a unique opportunity to probe the inner structure of a composite system (such as the proton) and hence testing our ability to understand the working of non-perturbative QCD.

Remarkable experimental progress in QCD spin physics in the last 20 years

1-Inclusive spin-dependent

DIS -EMC, SMC,COMPASS	E142,E143,E154,E156
HERMES	Jlab-Hall A, B(CLAS)

2-Semi-inclusive DIS

SMC	COMPASS	HERMES

3-Polarized pp collisions

RHIC	PHENIX	STAR

Outline

When the proton (or neutron) is polarized, the quarks and gluons are polarized as well

$$\delta q(x, Q^2) = q_+(x, Q^2) - q_-(x, Q^2).$$

Polarized PDF can be extracted from the experimental data using

the QCD fits.

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