Nucleon Structure Functions

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Abstract

New structure function measurements from fixed target experiments and especially HERA are reviewed. The extraction of parton distributions from these measurements is discussed with special emphasis on systematic problems. New information from Drell-Yan and direct photon production experiments are also presented . Finally the present uncertainties of our knowledge on parton distributions and on α_s from DIS experiments are discussed [1].

1 Introduction

Our knowledge of nucleon structure functions and of the parton distributions (PDF's) derived from them has steadily improved due to both the improvement of a large variety of measurements and a more sophisticated theoretical treatment of hard scattering processes in perturbative QCD. Structure functions and PDF's are needed for two reasons:

- They are a necessary input for all hard scattering processes involving nucleons to make precise predictions in the standard model and of course to look for deviations from theses predictions, and to make predictions for signals and backgrounds at colliders especially the LHC.
- They contain important information about the underlying physics of hadrons and allow stringent tests of perturbative QCD.

A hard scattering process in a hadron hadron collision is shown in figure 1. Two partons with momentum fractions x_1 and x_2 scatter and produce a

[1]Invited talk XVIII Physics in Collision