Dipartimento di Fisica
Università di Cagliari
INFN, Sezione di Cagliari

High Energy Physics Colloquia

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Parton Distribution Functions with resummation effects

Abstract

A crucial ingredient in the physics precision programme at the LHC is the accurate understanding of the internal structure of the initial state hadrons. Parton Distribution Functions (PDFs) are non-perturbative objects which encode information about the structure of the proton and which currently need to be determined from data. PDFs depend on a dimensionful scale Q (the hard scale of the process) and a dimensionless scale x, which represents the proton momentum fraction carried by the parton. Typically, global analyses of PDFs are extracted using fixed-order perturbation theory. However, in the large- and small-x limit large logarithmic terms appear at any order, thus spoiling the perturbative convergence. In these kinematic regions, an accurate description of PDFs demands to supplement a fixed-order description with the resummation of the enhanced contributions. I will present the first global PDF sets with resummation of large- and small-x logarithms, and I will discuss some phenomenological implications at present and future collider measurements.

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