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Constraints on the proton structure from CMS measurements of Standard Model processes

The knowledge of the proton structure, embedded in the parton distribution functions (PDFs) is of fundamental importance to make predictions for proton-proton collisions at the Large Hadron Collider. PDFs cannot be calculated through perturbative methods, but are determined through fits to a variety of experimental data.

Aim of this project will be to investigate the sensitivity to PDFs of two recent measurements of Drell-Yan cross-sections performed by the CMS Collaboration at 13 TeV of center-of-mass energy. The student will implement the measurement data within the xFitter framework together with their systematic uncertainties and produce theoretical predictions at next-to-next-to-leading order in the strong coupling. The agreement of between the data and predictions, including the PDF uncertainties, will then be quantified with a PDF profiling procedure using xFitter.

Field

B1: Particle physics analysis (software-oriented)

DESY Place

Hamburg

DESY Division

FH

DESY Group

CMS

Special Qualifications:

- basic programming skills (C++, python)

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