

Current Work and Interests

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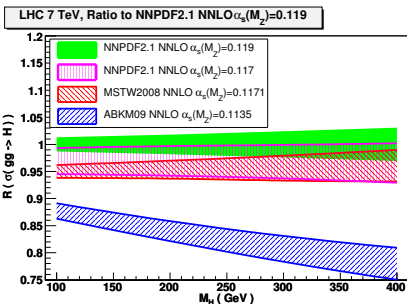
ERC Miniworkshop
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PDFs determination

A reliable PDFs determination is a crucial point for the evaluation of **LHC standard candle** processes.

Higgs production via gg fusion:



The framework:

- Most refined **statistical techniques**:
 - Monte Carlo or Hessian method,
 - Reweighting.
- Most up to date **pert. calculations**:
 - splitting functions,
 - coefficient functions.
- Most up to date **data sets**:
 - DIS,
 - Drell-Yan,
 - Jets.

Since 2 years member of the **NNPDF** Collaboration⁽¹⁾:

Main features of the NNPDF methodology:

- Fit PDFs with a set of **Neural Networks** on each replica:
⇒ **Unbiased** parametrization.
- Generation of **Monte Carlo replicas** of the experimental data:
⇒ No need to rely on **linear propagation** of errors.

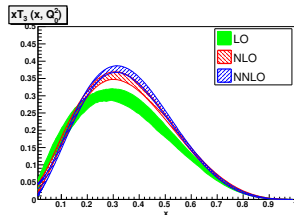
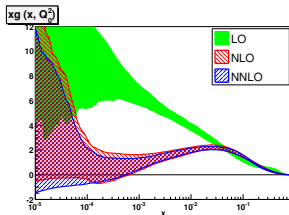
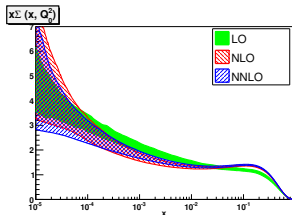
¹R.D.Ball, V.B., F.Cerutti, C. Deans, L.Del Debbio, S.Forte, A.Guffanti, N. Hartland, J.I.Latorre, J. Rojo, M.Ubiali

Implementation of the **Heavy quark** mass effects:

- by means of the **FONLL method** \implies

NNPDF2.1: ensemble of PDF sets presently available at **LO**, **NLO** and **NNLO**.

The NNPDF Collaboration, [Nucl. Phys. B849(2011)296 and Nucl.Phys. B855(2012)153]



- **Excellent convergence** of the perturbative expansion,
- NLO and NNLO always agree within uncertainties.

Ongoing work and plans for the future:

- Implementation of the **Intrinsic charm** contribution (ongoing).
- Implementation of the **\overline{MS} masses** in the structure functions (ongoing).
- Implementation of the **QED corrections** (next future).