



HERAFitter User's Meeting #2 23.11.2011

Agenda

Title	Speaker	File	Time
Introduction	V. Radescu	voica.pdf	10+5min
HERAFitter talk at PDF4LHC	C. Diaconu	cristi.pdf	10+5min
NNLO ttbar cross section developments	S. Naumann-Emme	sebastian.pdf	15+5min
Theory update on F2/FL calculations	F. Olness	fred.pdf	15+5min
LHAPDF interface to HERAFitter	K. Nowak	krzysz.pdf	15+5min
Discussion	All	discussions.pdf	20min



HERAFitter

- Time scale:
 - 15.09.2011 Package released (blessed by both H1 and ZEUS collaborations)
<http://projects.hepforge.org/herafitter/>
 - 21.09.2011 Package presented in ATLAS community (ATLAS-Germany meeting, Goettingen)
 - ▾ PDF Activities in ATLAS have been openly accepted: ATLAS PDF Fit Forum with bi-weekly meetings (convenors: Uta Klein, VR)
 - 12.10.2011 Package presented in CMS community (CMS meeting, CERN)
 - 19.10.2011 First HERAFitter User's Meeting
 - 23.11.2011 Second HERAFitter User's Meeting
 - 28.11.2011 First presentation of the HERAFitter at a workshop (PDF4LHC, Cristi Diaconu)
- HERAFitter package Users:
 - 25 Downloads so far, mostly from HERA community, but there are also downloads from ATLAS, CMS, NNPDF, theory as well with successful installation reports.
 - The core developers are mostly H1 members with wishes from ZEUS, CMS and ATLAS to contribute



HERAFitter Developments

- Regular meetings among the HERAFitter developers (every (bi)-week):
- More published (non-HERA) data has been included and uploaded to the HERAFitter web page compatible with the beta release:
<https://znwiki3.ifh.de/HIFitter/HIFitter/downloads/datatables>
- Developments towards first stable release:
 - Time scale for the first stable release, HERAFitter 1.0, is bound to the HERAPDF2.0 set.
 - The next stable releases, 2.0, etc, will more and more serve needs of the LHC community
- New developments:
 - new processes: polarised ep, normalised Z rapidity
 - Improvements in user interface: streamlined inclusion of external parameters, improved plotting tools
 - Extra interfaces:
 - ▽ interface to LHAPDF (see K. Nowak's talk)
 - ▽ ttbar NNLO cross sections (see S. Naumann's talk)
 - ▽ ACOT NNLO developments (see F. Olness's talk)
 - ▽ Plans to integrate NNPDF reweighting tool (K. Lohwasser)
 - ▽ Addition of HERAverager tool (S. Glazov)
 - ▽ Synchronisation with ZEUSFitter (M. Cooper-Sarkar)



Beyond release 1.0.0

- Code development model:
 - Open development trunk, more external developers with commit rights: more strict code validation.
 - Modularity to allow simultaneous code development inside ATLAS and CMS.
 - Regular user's meetings.
- Physics content:
 - Keep up with recent developments in various heavy flavour treatment: NNLO, running mass.
 - Extend DGLAP code: e.g. inclusion of photon PDF.
 - Extra features for the process descriptions: non factorisable EW corrections, W, Z polarisation, CI, etc.



HERAFitter User's interaction

- Monthly meetings:
 - Report new features/developments to the users
 - Propagate feedback/wishes from users to the developers
- Communication:
 - ➔ Mailing lists:
 - hlfitter-help -- for immediate help on HERAFitter 0.1.0
 - herafitter-user -- for broad discussion among all users
 - hlfitter-devel -- for developers discussion
(also by invitation)

Discussions and presentations at the monthly meetings, minutes will be stored on website.

YOUR FEEDBACK IS WELCOME!



EXTRA



Functionalities in HERAFitter.0.1.0

HI fitter

SVN

DIS(upol)

✓

DIS(pol)

✓

RT(st)

✓

RT(kfact)

✓

DY

✓

Jets ep

✓

Jets pp,ppbar

✓

Param studies

✓

Error band

✓

MC errors

✓

LHAPDF grids

✓

Drawing Tools

✓

Out of the box:

- HI fitter produces central fit for HERAPDF1.0
- DY and jet packages can be used to fit pp, ppbar data as well

DATA:

- DIS ep
 - ▾ Inclusive
 - ▾ jets
- DY pp and ppbar
 - ▾ W, Z, cross sections
 - ▾ Zrapidity
 - ▾ W asymmetries
 - ▾ jets
- Error treatment:
 - ▾ Correlated, Uncorrelated
 - ▾ Hessian Method
 - ▾ MC method

Parametrisation studies:

- Standard functional form of PDFs
- CTEQ
- Chebyshev

Theory (DIS):

- ZM-VFNS accessed from QCDNUM
- GM-VFNS RT from R. Thorne

Treatment for jets:

- FastNLO:
 - ▾ A wrapper around NLOjets++
- Applgrid:
 - ▾ A wrapper around MCFM, NLOjets++

DY cross sections at LO x k factors

Output:

- PDFs at predefined scales
- LHAPDF grids
- Theory predictions per data points
- Pulls per data points