HERAFitter Users Meeting

- HERAFitter-0.3.0 release
  - new features
  - documentation
- Status of HERAverage
- Post HERAFitter-0.3.0 developments

Today's agenda:

26.03.2013

Tuesday, 26 March 2013

14:00 - 14:30	HERAFitter BETA-3 *30'*
	Speakers: Ringaile Placakyte (Deutsches Elektronen-Synchrotron (DE)), Voica Ana Maria Radescu (Deutsches Elektronen-Synchrotron (DE))
14:30 - 14:50	QCDNUM update *20'*
	Speaker: Michiel Botje (NIKHEF (NL))
14:50 - 15:10	ACOT update *20'*
	Speaker: Prof. Fred Olness (Southern Methodist University)

HERAFitter NEWS

Meetings:

→ SM@LHC, 9-12 Apr, Freiburg (HERA, LHC talks)

→ PDF4LHC, 17th April, CERN,: dedicated talk (VR)

→ DIS13, April, Marseille: dedicated talk (RP)

→ 5th Workshop of the APS Topical Group on Hadron Physics, 10-12 Apr, Denver, Coloraro (LHC talk)

→ Abstract submitted to LHCP 2013 May, Barselona

HERAFitter NEWS

HERAFitter-0.3.0 release TODAY

→ tarball available, accessible from the web page

→ theory files have been separated from tar file, can be downloaded
    from the web page

→ registration will no longer be required for downloading of release
    (subscription optional)

→ significant efforts on documentation:
    writeup, doxygen, release notes (next slides)

Computing: separate computing group for HERAFitter

HERAverager

Revised HERAverager release candidate is in preparation

https://wiki-zeuthen.desy.de/HERAverager

- Pre-release studied by developers since Jan 2013

- Recently improved treatment of multi-process average with correlated uncertainties:

  → good separation of different processes, stable working

  → improved output, however plotting scripts need adjustment

- New format for the output of pulls

- Updated documentation: manual is supplemented by description of a few new options

- More feedback from developers is needed

- Target beta-release date: end of April

HERAFitter-0.3.0

New in HERAFitter-0.3.0:

✓ Flexible parametrisation and regularisation techniques

✓ New FastNLO format: upgrade to the official reader

✓ PDF Bayesian reweighting based on eigenvectors (Hessian method)

✓ Reorganisation of the chisquare module

✓ Offset method (in "old structure" of the chi2 module, will be dropped in the next release)

✓ TMD (uPDF), several fitting options with CCFM evolution (gluon uPDF)

✓ Dipole models: mixed dipole-DGLAP fits (BGK model)

✓ Newer EW code for DIS

✓ Updated ACOT code: QCDNUM for k-factors, higher orders, ACOT in QCDNUM → *see F. Olness talk*

✓ Asymmetric uncertainties added for Toy MC error propagation

✓ Inclusion of more data sets (CMS, Tevatron)

✓ User's examples, 'make check' sanity check via auto-tools

Doxygen, Write-up and Release Notes

Release Notes:
(accessible via the release download page)

HERAFitter: Releases and Updates
March, 2013
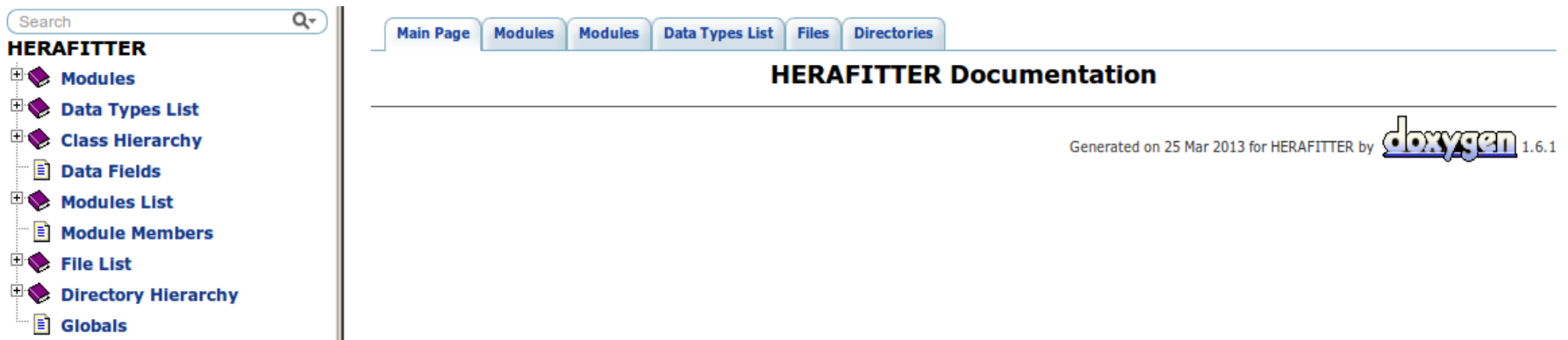
HERAFitter versions are labeled as herafitter-i.j.k where i is the stable release number, j is beta release number, and k is bug fixes.

Release	Date	Description
herafitter-0.3.0	26.03.2013	• The theoryfiles directory is detached from the release (to be downloaded separately) • Added via automake tools a make check to test sanity of the codes. • Added a User Example directory for reference outputs. • Inclusion of more data sets (like CMS, Tevatron). • Implemented a treatment for asymmetric systematic uncertainties. • Added updates to ACOT code which include higher order contributions for F_2 and F_L. • Added new dipole models. • Implementation of treatment for the unintegrated PDFs. • Reorganisation of the χ^2 module, the old style is preserved and it should be used for the offset method and covariance matrix for chisquare representation. • Implementation of PDF reweighting based on eigenvectors. • Added new parametrisation styles and regularisation techniques. • A New FastNLO format was introduced.

DOCUMENTATION

Doxygen:

Web based standard tool for generating documentation for C++ sources (supports many other programing languages)

→ implementation for HERAFitter by A. Sapronov

→ fully functioning, some improvements to implementation are ongoing

HERAFitter DOCUMENTATION

Write-up:

Almost 50 pages of documentation

Incorporated comments from
Steering Commity members
(thanks Cristi and Olaf)

The next milestone is stable release

→ further improvements to document
   are welcome

HERAFitter
PDF Fitting package

HERAFitter developers

March 25, 2013

Abstract

The determination of the proton patron distribution functions is a complex endeavor involving several physics process. The main process is the deep-inelastic scattering and the central data set covering most of the proton structure phase space is provided at HERA ep collider. Further processes (fixed target DIS, ppbar collisions etc.) provide further constrains for particular aspects: flavor separation, very high Bjorken-x etc. In particular, the precise measurements obtained or to come from LHC will continue to improve the knowledge of the PDF. HERAFitter project aim at providing a framework for QCD analyses related to the proton structure in the context of multi-process and multi-experiment. The framework includes modules or interfaces enabling a large number of theoretical and methodological options, as well as a large number of relevant data sets from HERA, Tevatron and LHC. This manual explains the theoretical input used in the QCD analysis, the fit methodology as well as the the installation procedure of the program. More information and the package downloads can be found on the web site http://herafitter.org.

DOCUMENTATION

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Releases of the HERAFitter QCD analysis package

- Versioning convention: **i.j.k** with
  - **i** - stable release
  - **j** - beta release
  - **k** - bug fixes.
- The release notes can be found in this attachment: HERAFitter_release_notes.pdf.

Date	Version	Files	Remarks
03/2013	0.3.0	herafitter-0.3.0.tgz	latest release includes manual.pdf and decoupled theoryfiles.tgz
07/2012	0.2.1	herafitter-0.2.1.tgz	fix release for 0.2.0
05/2012	0.2.0	herafitter-0.2.0.tgz	added functionality for LHC users
09/2011	0.1.0	herafitter-0.1.0.tgz	first release

Documentation

- From 0.3.0 on a manual is provided together with an example directory.
- The **README** file (accessible via the package) gives an explanation for a quick start.

Web access to SVN

- For users with a valid DESY account, the SVN repository is accessible on the web at https://svnsrv.desy.de/k5viewvc/h1fitter .
- For users without DESY account, the SVN repository is accessible on the web at https://svnsrv.desy.de/basviewvc/h1fitter/ with herafitter-user@desy.de account and PDFfits password.

Doxygen Documentation

- The doxygen documentation is located here

Links to external packages

External packages that could be run with HERAFitter via configuration flags can be accessed for convenience HERE .

HERAverager data combination package

Information can be accessed here https://wiki-zeuthen.desy.de/HERAverager

Subscription

We encourage users to subscribe to mailing list for news and updates related to the HERAFitter webpage. (average rate of e-mails is once a month), please contact herafitter-help@desy.de (or by creating a user account to this wiki we get a notification)

NEW Download Page

Post-BETA3 Developments

- QED PDFs (Renat, M. Botje) → *talk today*

- ACOT (F.Olness) and S-ACOT NNLO (M. Guzzi) → *talk today*

- Offset method in new chi2 scheme, restructuring (W. Slominski)

- OpenMP – parallel code (V. Kolesnikov)

- improvements to plotting tool (K. Nowak)

- EW (DIS) code, restructuring (H. Spiesberger, V. Radescu)

Longer term:

- Blobel minimisation/chisquare (S. Schmitt)

- Nuclear PDFs (I. Schienbein)

- Fitting photon PDF (O. Kuprash)

- Additional low-x models

- Different evolution codes

Next User's Meeting

Next User's meeting on 23th of April in DIS2013, Marseille

XXI INTERNATIONAL WORKSHOP ON DEEP-INELASTIC SCATTERING AND RELATED SUBJECTS
Marseille Congress Centre April 22-26 2013

DIS 2013

Agenda

	Sunday April 21	Monday April 22	Tuesday April 23	Wednesday April 24	Thursday April 25	Friday April 26
AM		Plenary Session	Parallel Session	Parallel Session	Parallel Session	Plenary Session
PM	Arrival, Registrations	Plenary Session	Parallel Session	Parallel Session	Excursions or topical meetings	Plenary Session
Evening		Reception Cocktail	Satellite Meetings	Conference Dinner - Excursion		Outreach Talk

The conference will host the HERAFitter Users Meeting on Tuesday April 23, 18h30-20h00 (agenda).

The next stable release is planned in October 2013