

xFitter external meeting – Status of the xFitter project



- ◆ **General info/announcements**
- ◆ **Current release status/news**
- ◆ **Future developments**

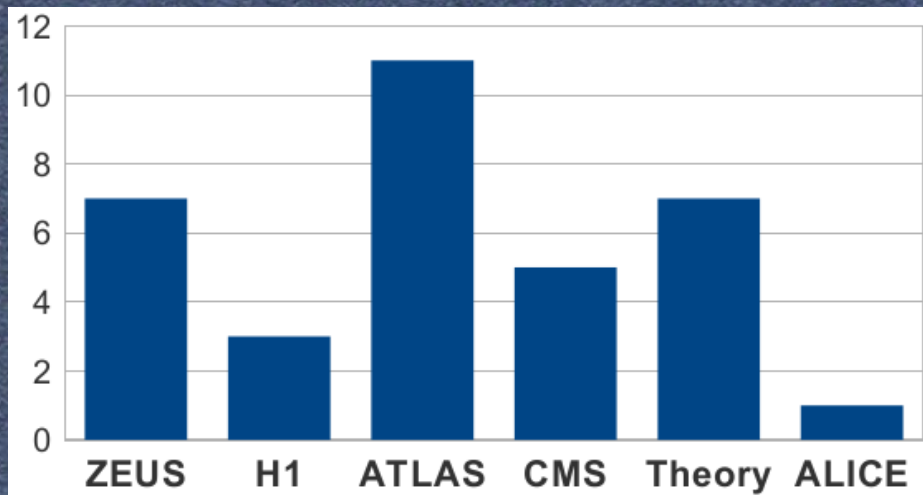
General intro

**! NOTE change of the project name:
HERAFitter → xFitter**

General intro

xFitter is an open source QCD fit framework:

- ◆ Perform QCD analysis of proton structure, extract PDFs
- ◆ Assess impact of the new data on PDFs
- ◆ Check experimental data consistency
- ◆ Test different theoretical approaches to the proton structure description.



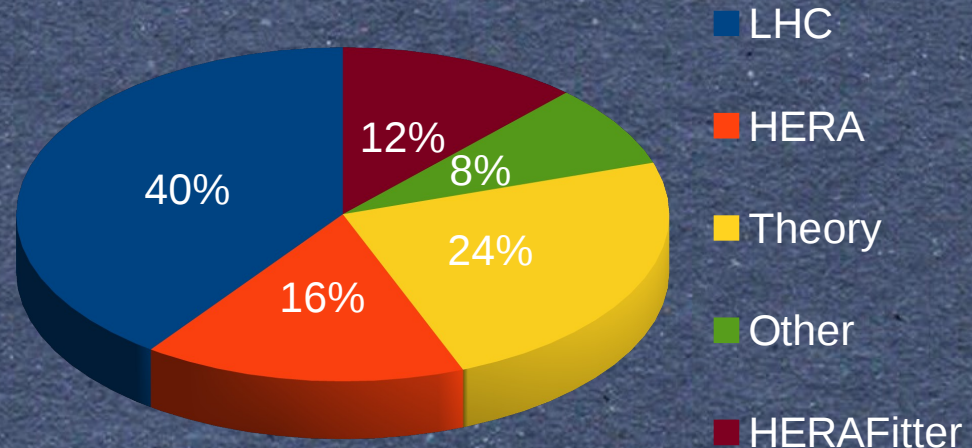
The project is developed and maintained by ~30 developers from HERA and LHC experiments and theorists.

! Announcement:

Andrey Sapronov – software (co)librarian

Results using xFitter

- ◆ 31 public results obtained using *xFitter* from the beginning of the project
- ◆ LHC experiments provide the main developments and usage of *xFitter* platform
- ◆ 3 *xFitter* publications carried out by *xFitter* developers
- ◆ 11 talks at conferences and workshops in 2015

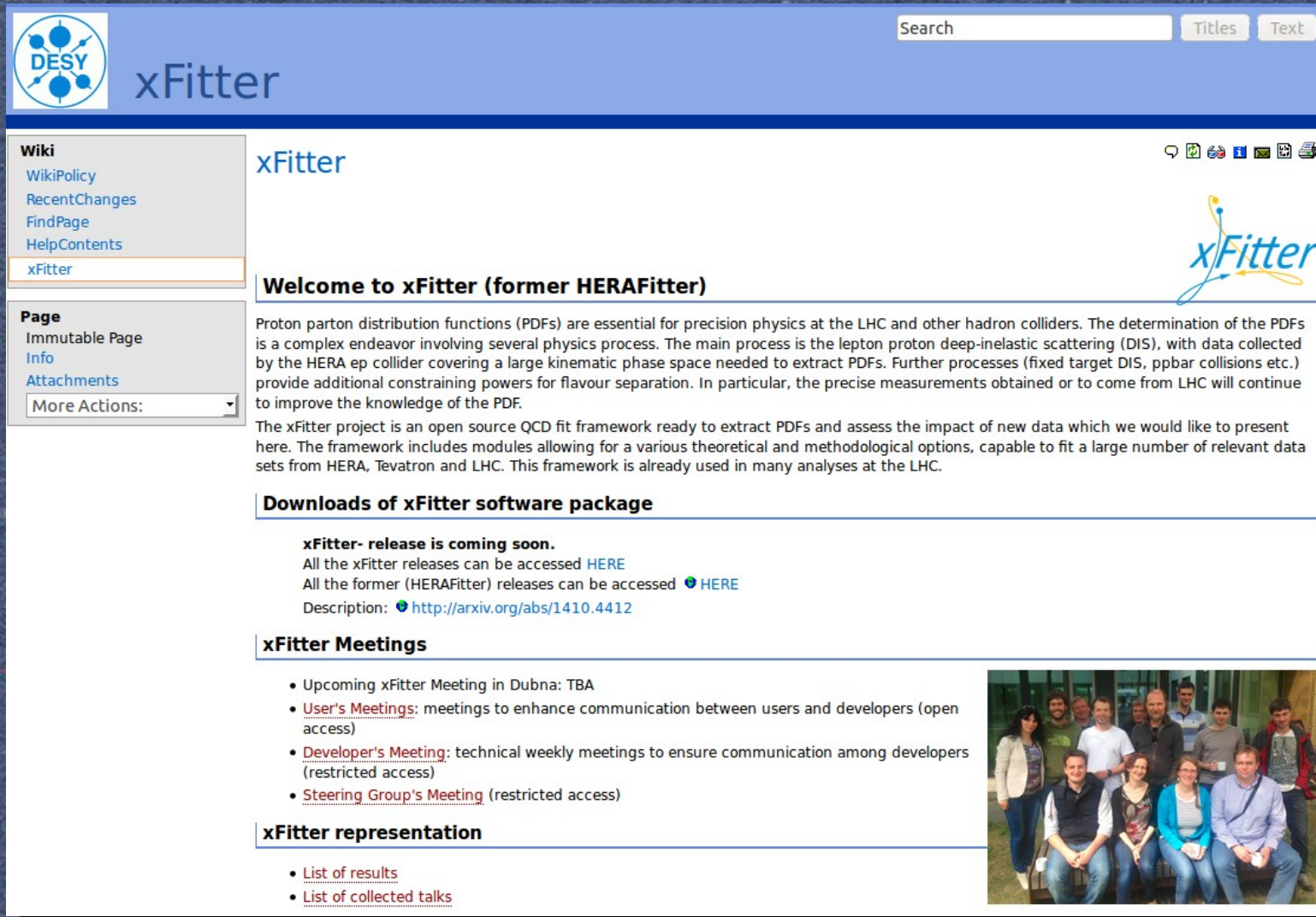


Full list of the results using *xFitter*:

<https://www.xfitter.org/xFitter/xFitter/results/>

Status of xFitter web-page

New web-page: www.xfitter.org



The screenshot shows the xFitter web page. At the top left is the DESY logo and the text 'xFitter'. To the right is a search bar and buttons for 'Titles' and 'Text'. Below the header is a navigation menu with 'Wiki' and 'Page' sections. The main content area has a title 'xFitter' and a subtitle 'Welcome to xFitter (former HERAFitter)'. The text describes the project's purpose and provides links for software downloads and meetings. A group photo of the team is shown on the right side.

Wiki
WikiPolicy
RecentChanges
FindPage
HelpContents
xFitter

Page
Immutable Page
Info
Attachments
More Actions: ▾

xFitter

Welcome to xFitter (former HERAFitter)

Proton parton distribution functions (PDFs) are essential for precision physics at the LHC and other hadron colliders. The determination of the PDFs is a complex endeavor involving several physics process. The main process is the lepton proton deep-inelastic scattering (DIS), with data collected by the HERA ep collider covering a large kinematic phase space needed to extract PDFs. Further processes (fixed target DIS, ppbar collisions etc.) provide additional constraining powers for flavour separation. In particular, the precise measurements obtained or to come from LHC will continue to improve the knowledge of the PDF.

The xFitter project is an open source QCD fit framework ready to extract PDFs and assess the impact of new data which we would like to present here. The framework includes modules allowing for a various theoretical and methodological options, capable to fit a large number of relevant data sets from HERA, Tevatron and LHC. This framework is already used in many analyses at the LHC.

Downloads of xFitter software package

xFitter- release is coming soon.
All the xFitter releases can be accessed [HERE](#)
All the former (HERAFitter) releases can be accessed [HERE](#)
Description: <http://arxiv.org/abs/1410.4412>

xFitter Meetings

- Upcoming xFitter Meeting in Dubna: TBA
- [User's Meetings](#): meetings to enhance communication between users and developers (open access)
- [Developer's Meeting](#): technical weekly meetings to ensure communication among developers (restricted access)
- [Steering Group's Meeting](#) (restricted access)

xFitter representation

- [List of results](#)
- [List of collected talks](#)




Current status: xFitter-1.2.0

- ◆ Realese xFitter-1.2.0.tgz available at:

<https://www.xfitter.org/xFitter/xFitter/DownloadPage>

Releases of the xFitter 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: [@ xFitter_release_notes.pdf](#) .
- Installation script for xFitter together with QCDNUM, APFEL, APPLGRID, LHAPDF [@ install-xfitter](#)

Date	Version	Files	Remarks
 02/2016	1.2.0	@ xfitter-1.2.0.tgz	release with decoupled data and theory files which can be dowloaded with @ getter.sh script

- ◆ Stand-alone script for downloading data/theory.
- ◆ By default only combined HERA data are distributed
- ◆ NOTE: theory directory no longer exists, the theory files are stored under same location with data.

Current status: Getter script

- ◆ Use `getter.sh` script to download data sets:

```
[pirumov@nafhh-herafitter]~% ./getter.sh help
help

For the list of available data sets check:      datafiles/DataFilesList.txt or input_steering/steering
.txt.ALLdata
To download all available data sets do:        ./getter.sh ALL
To download a data set do:                     ./getter.sh datafile_name , this will download the i
ndicated dataset to directory as it is in the fitter structure (dirCollider/dirExperiment/dirReactionType
/dirArxivNumber)
To download a data set to a specific directory do: ./getter.sh datafile_name dir_name
Note, that related theory or correlation files (if any) will be downloaded together with the specified da
ta file
```

- ◆ There is a txt file with all available data sets `DataFilesList.txt` in *datafiles/* directory

Current status: xFitter-1.2.0

Changes in executable names:

- ◆ FitPDF → xfitter
- ◆ DrawPdfs → xfitter-draw
- ◆ Postproc → xfitter-process

QCDNUM version 17.01.11 or higher is recommended to be used with current release as well as the trunk version:

- ◆ to be able to use i.e. photon PDFs
- ◆ QCDNUM is now using autotools

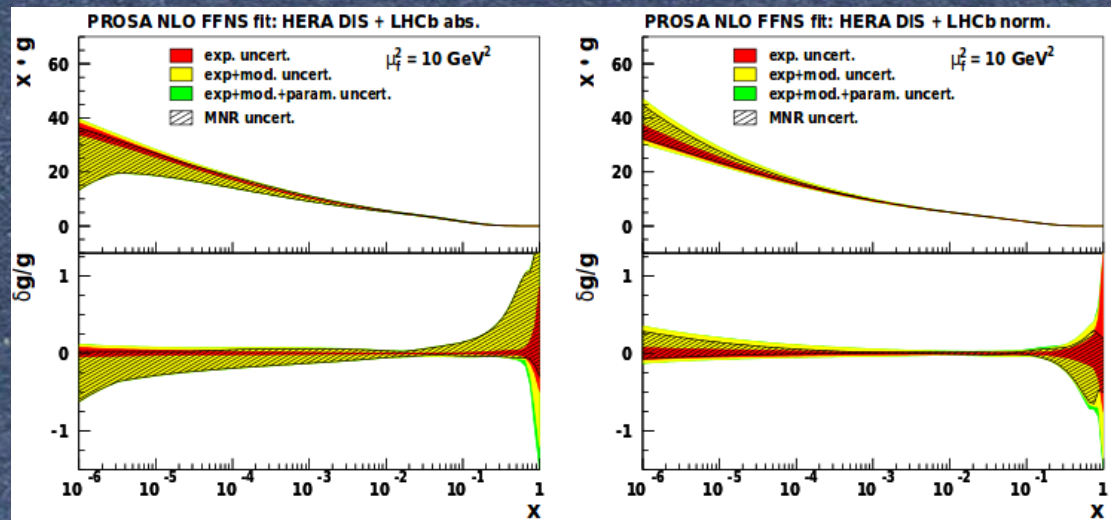
Added possibility to configure without root:

- ◆ *--disable-root* option

Current status: xFitter-1.2.0

- ◆ FONLL scheme available via interface to APFEL
 - ◆ various options available
 - ◆ <https://apfel.hepforge.org/>
- ◆ Melin Transformation available via interface to MELA code
 - ◆ <https://apfel.hepforge.org/mela.html>
- ◆ QED PDFs available through QCDNUM and APFEL interfaces
- ◆ ABM scheme adjusted to OPENQCDRAD 2.0b4
- ◆ Added MNR fixed flavour number scheme calculation code used for the LHCb and HERA data analysis
 - ◆ added also corresponding LHCb data

[*Eur.Phys.J. C75 (2015) 8, 396*]



Current status: xFitter-1.2.0

- ◆ Updated to the latest FastNLO version
- ◆ Theory interfaces between FastNLO and APPLGRID are unified
 - ◆ old format for FastNLO is still operational
- ◆ Merging of Profiling and Reweighting code:
 - ◆ using now same general infrastructure
- ◆ New reweighting option using Giele-Keller weights available
- ◆ LHAPDFs have a direct access avoiding QCDNUM:
 - ◆ via LHAPDFNATIVE option
- ◆ More data added:
 - ◆ LHCb, HERA, updated Tevatron data

Future and ongoing developments

To be discussed on Saturday:

- ◆ xFitter on GIT
- ◆ Parametrisation interface (ongoing)
- ◆ Drawing tools from LHAPDF
- ◆ Resummation
- ◆ Chi2scan improvement (done)
- ◆ ACOT @ NNLO (ongoing)
- ◆ Higher twists (to be committed)
- ◆ Improve the tool for profiling (ongoing)
- ◆ Nuclear PDFs

Users' meeting: Thursday 18/02

10:00	[1] Welcome word	BEDNYAKOV, Vadim
10:15	[2] Technical information	SAPRONOV, Andrey
10:30	[3] Status of xFitter project	PIRUMOV, Hayk
11:00	[5] xFitter performance: ATLAS analysis	SARKAR, Amanda
11:20	[6] xFitter performance: CMS analysis	PLACAKYTE, Ringaile
11:40	[4] Overview of exp. challenges: precision and new observables	GLAZOV, Alexander

14:00	[7] Theoretical issues in the measurement of the W boson mass	BOONEKAMP, Maarten
14:25	[28] Experimental means to constrain theoretical systematics on Mw	KIVERNYK, Oleh
14:45	[8] New observables	SARKAR, Amanda
15:10	[31] CTxx nucleon PDFs.	OLNESS, Fred
15:30	Coffe break	
15:50	[9] Discussion, groups by topic.	

Users' meeting: Friday 19/02

09:30	[10] The SANC project	ARBUZOV, Andrey
10:00	[11] Resummation 1	CAMARDA, Stefano BERTONE, Valerio
10:30	[12] Parton densities at small x values. Combined H1 and ZEUS F_2 data. F_2^c data. BFKL corrections	KOTIKOV, Anatoly
11:00	[13] Heavy Flavors	OLNESS, Fred
11:30	[26] Updates in TMD sector	LELEK, Aleksandra Anna JUNG, Hannes HAUTMANN, Francesco
14:00	[14] APPLgrid	STAROVOITOV, Pavel
14:20	[15] FastNLO	RABBERTZ, Klaus
14:40	[17] QEDevol module in xFitter	SADYKOV, Renat
15:00	[27] News from APFEL	BERTONE, Valerio
15:20	Coffebreak	
15:40	[16] CUTE	CAMARDA, Stefano
16:00	[18] HERAverager	KARNEVSKIY, Mikhail GLAZOV, Alexander
16:30	[19] PDF profiling techniques	GLAZOV, Alexander CAMARDA, Stefano
17:00	[20] Common and group discussions	

Developers' meeting: Saturday 20/02

09:30	[22] GIT intro	SAPRONOV, Andrey BERTONE, Valerio ALL
10:00	[23] Drawing tools	CAMARDA, Stefano ALL
10:30	[29] User interface	GLAZOV, Alexander
11:00	[30] Interfaces for new theory modules	GLAZOV, Alexander
11:30	[21] PDF parametrization	SAPRONOV, Andrey ALL
12:00	[32] LHAPDF grid combination module	Mr. SHVYDKIN, Pavel
12:20	[25] Conclusions	