

# HERAFitter Users Meeting



23d of April 2014

- News and Conferences
- Developments
- Today's agenda

The first **HERAFitter Developers Team** publication

→ addresses the correlations in PDF uncertainties at different orders

Parton distribution functions at LO, NLO and NNLO with correlated uncertainties between orders

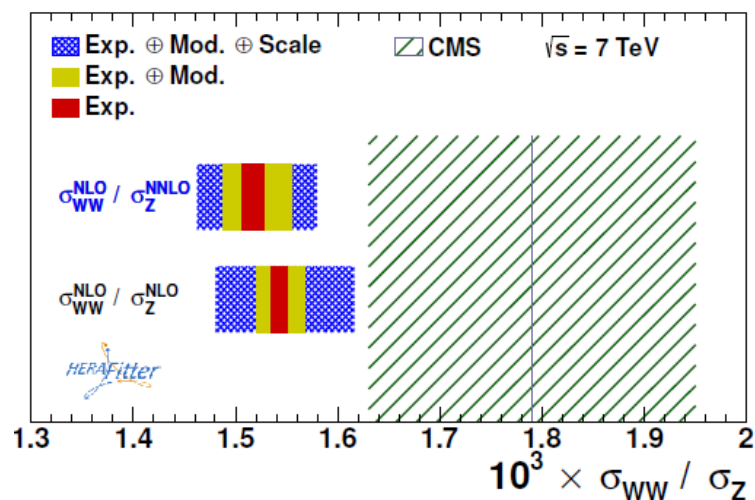
HERAFitter developers' team ·

P. Belov<sup>1,12</sup> · D. Britzger<sup>1</sup> · S. Camarda<sup>1</sup> · A.M. Cooper-Sarkar<sup>2</sup> ·  
C. Diaconu<sup>3</sup> · J. Feltesse<sup>13</sup> · A. Gzhko<sup>1</sup> · A. Glazov<sup>1</sup> · V. Kolesnikov<sup>4</sup> ·  
K. Lohwasser<sup>14</sup> · A. Luszczak<sup>5</sup> · V. Myronenko<sup>1</sup> · H. Pirumov<sup>1</sup> ·  
R. Plačákytė<sup>1</sup> · K. Rabbertz<sup>6</sup> · V. Radescu<sup>1</sup> · A. Sapronov<sup>4</sup> ·  
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M. Sutton<sup>8</sup> · J. Tomaszewska<sup>9</sup> · O. Turkot<sup>1</sup> · G. Watt<sup>11</sup> · K. Wichmann<sup>1</sup>  
and M. Lisovyi<sup>1</sup>

DESY 2014-054  
arXiv:1404.4234

Misha's talk today

**Abstract** Sets of parton distribution functions (PDFs) of the proton are reported for the leading (LO), next-to-leading (NLO) and next-to-next-to leading order (NNLO) QCD calculations. The parton distribution functions are determined with the HERAFitter program using the data from the HERA experiments and preserving correlations between uncertainties for the LO, NLO and NNLO PDF sets. The sets are used to study cross-section ratios and their uncertainties when calculated at different orders in QCD. A reduction of the overall theoretical uncertainty is observed if correlations between the PDF sets are taken into account for the ratio of  $WW$  di-boson to  $Z$  boson production cross sections at the LHC.



The first **HERAFitter Developers Team** publication

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## More publications planned in the future

### Candidate Analyses

Date	Project Name	Main Analysers	Target Conference
Jan 2014	<a href="#">Impact of LO/NLO/NNLO PDF correlations</a>	H. Pirumov, M. Lisovyi, A. Gizko, S. Glazov	DIS 2014
Feb 2014	<a href="#">Study data compatibility and impact on PDFs from Tevatron</a>	S. Camarda, Andreas Jung (Tevatron)	Summer 2014
May 2014	<a href="#">PDF parametrisation studies using various regularisation methods</a>	H. Pirumov, V. Radescu, S. Glazov, A. Schoening	Summer 2014

**General HERAFitter paper** is planned soon (currently in the stage of circulation)

Date	Conference/Workshop	Presenter	Link	Remarks
17.11-21.11.2014	<a href="#">HiX2014</a>	V. Radescu (TBC)	HERAFitter talk	invited talk
29.09-03.10.2014	Proton Structure in the LHC era	HERAFitter team	lecture/tutorials	PDF event at DESY
28.7-06.08.2014	<a href="#">ICNFP2014</a>	speaker	HERAFitter talk/poster	abstract to be submitted (deadline: 30.05)
21-26.07.2014	<a href="#">BEACH2014</a>	A. Saproinov	HERAFitter talk/poster	abstract submitted
2-9.07.2014	<a href="#">ICHEP2014</a>	speaker	HERAFitter talk/poster	abstract to be submitted (deadline: 23.05)
17-21.06.2014	<a href="#">LowX2014</a>	R. Placakyte	HERAFitter talk	abstract accepted
16-19.06.2014	<a href="#">QCD@WORK2014</a>	M. Guzzi	PDF talk	HERAFitter slides adverts
2-7.06.2014	<a href="#">LHCP2014</a>	speaker	HERAFitter talk/poster	abstract submitted
18-23.05.2014	<a href="#">Blois2014</a>	speaker	HERAFitter talk	abstract accepted
5-8.05.2014	<a href="#">Pheno2014</a>	S. Glazov	HERAFitter talk	HERAFitter project and studies
28.04-02.05.2014	<a href="#">DIS2014</a>	H. Pirumov, M. Lisovyi	HERAFitter talk	2 abstracts accepted: HERAFitter project and studies
22-29.03.2014	<a href="#">MoriondQCD</a>	V. Radescu	<a href="#">HERAFitter talk</a>	stable release

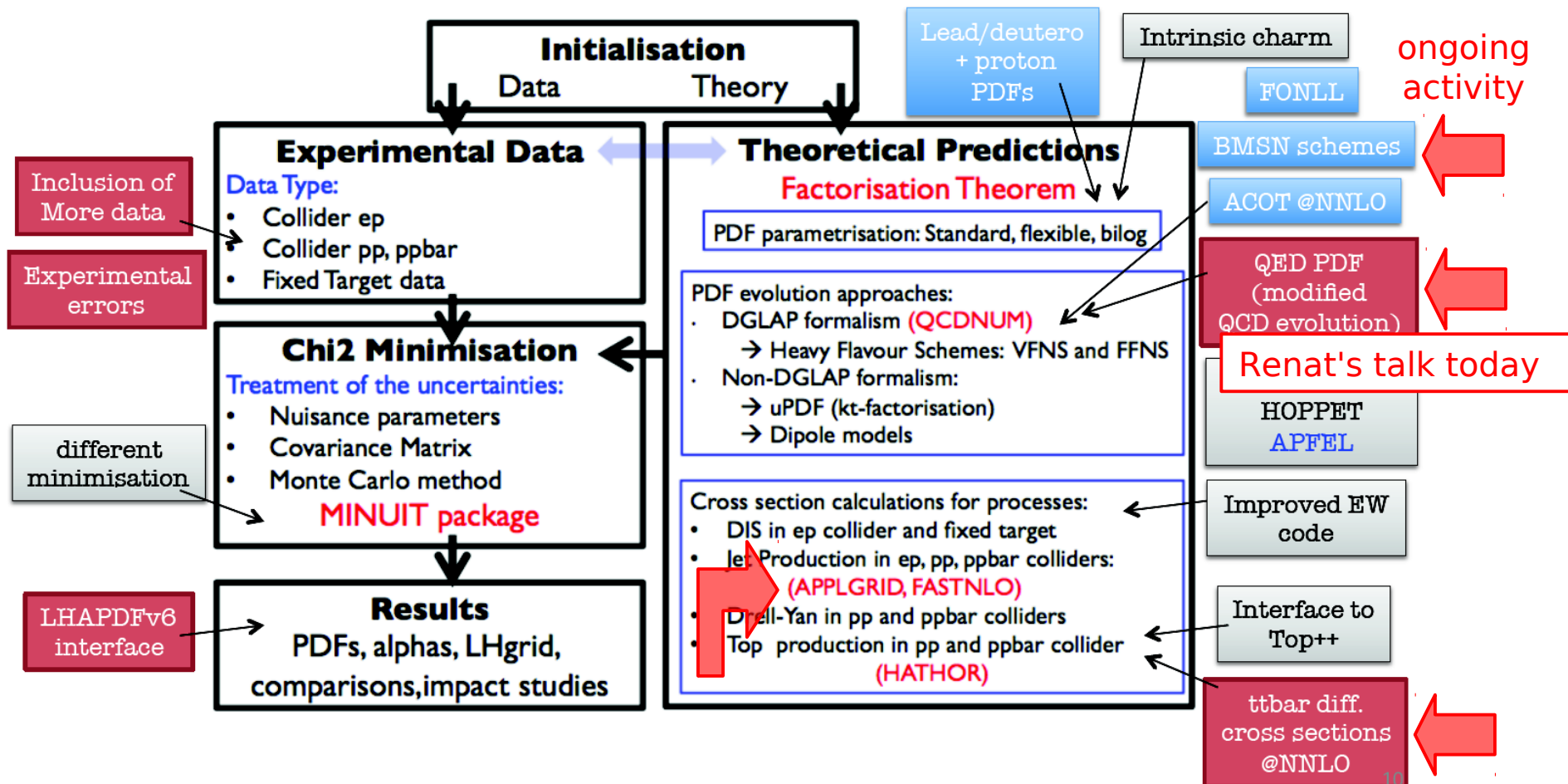
## Proton Structure in the LHC Era - School and Workshop

from 29 September 2014 to 02 October 2014 (Europe/Berlin) DESY Hamburg  
Europe/Berlin timezone

 Search

**dates are fixed, other details will be announced in May**

Ongoing and longer term **developments** planned in HERAFitter:



Improving the HERAFitter connection to High Energy Physics (HEP) tools

## The Durham HepData Project



REACTION DATABASE • DATA REVIEWS • PDF PLOTTER

ABOUT HEPDATA • SUBMITTING DATA

### About HepData

The Durham HepData Project has for more than 30 years compiled the Reactions Database containing what can be loosely described as cross sections from HEP scattering experiments. The data comprise total and differential cross sections, structure functions, fragmentation functions, distributions of jet measures, polarisations, etc., from a wide range of interactions. They are all made publically available in the Reaction Data Database.

- getting involved in the common HEP activities about data storage and representation
- HepData in HERAFitter format

Generally, the HepData output to different file formats is done by writing a Java class for each format using the information stored in MySQL database

- can be done directly in HERAFitter? Possible to use directly database instead of text dataset files?

### Currently available outputs:

#### plain text

As it says, without the html additions

#### AIDA

Output in [AIDA](#) (xml) format

#### PyROOT

Output in [PyROOT](#) format

#### YODA

Output in [YODA](#) format

#### ROOT

Output in [ROOT](#) format

#### mpl

Output in [matplotlib](#) format

#### ScaVis

Output in [SCaVis](#) format

#### MarcXML

Output in [MARCXML](#) format

Thanks to Graeme Watt for the support



## Today's agenda:

### HERAFitter User's meeting

Wednesday, 23 April 2014 from **15:00** to **18:00** (Europe/Zurich)

at **Test**

DESY: SR 01

Manage ▼

**Description** ONLY If default VIDYO fails ——— a backup VIDYO LINK:

Extension 9265520

Meeting PIN 2323

Auto-join URL <http://vidyoportal.cern.ch/flex.html?roomdirect.html&key=QpFaaSZLsTe1>

**Video Services** Vidyo public room : HERAFitter\_Users\_meeting [More Info](#) | [Join Now!](#)

#### Wednesday, 23 April 2014

- |               |   |
|---------------|---|
| 15:00 - 15:20 | Status 20' <span>▼</span>   |
|               | Speakers: Voica Ana Maria Radescu (Deutsches Elektronen-Synchrotron (DE)), Ringaile Placakyte (Deutsches Elektronen-Synchrotron (DE)) |
| 15:20 - 15:40 | PDFs at LO, NLO, NNLO with correlated uncertainties between orders 20' <span>▼</span>   |
|               | Speakers: Hayk Pirumov (Deutsches Elektronen-Synchrotron (DE)), Mykhailo Lisovyi (Deutsches Elektronen-Synchrotron (DE))              |
| 15:40 - 16:00 | QED PDFs in HERAFitter 20' <span>▼</span>   |
|               | Speaker: Renat Sadykov (Joint Inst. for Nuclear Research (RU))  |