



HERAFitter Developers' Meeting

Welcome to Heidelberg!

- **wifi:**
 - eduroam provided
 - or connect with the net "PI-Guest"
 - use browser and connect to server 'd0' or 'd0.physi.uni-heidelberg.de'
 - go to Guest Network and fill out the registration form:
 - Name and HERAFitter as organisat
 - access will be granted
 - or: sasha with password: e4590451828

- **agenda**

- **status of developments**

HERAFitter External Meeting

13 May 2015
Physikalisches Institut Heidelberg
Europe/Zurich timezone

- Overview
- Scientific Programme
- Timetable
- Contribution List
- Author List
- My Conference
- My Contributions
- Registration
- Participant List
- Venue
- Accommodation

HERAFitter external meeting to discuss the ongoing developments towards next stable release and future plans



Today's agenda <https://indico.cern.ch/event/382006/>

Morning session:
developers meeting and discussions

09:30 Status

Presenter(s): Voica Ana Maria RADESCU (*Deutsches Elektronen-Synchrotron (DE)*), Ringaile PLACAKYTE (*Deutsches Elektronen-Synchrotron (DE)*)
Location: Physikalisches Institut Heidelberg

09:50 News from QCDNUM

Presenter(s): Michiel BOTJE (*NIKHEF (NL)*)
Location: Physikalisches Institut Heidelberg

10:10 QED + QCD PDFs in HERAFitter

Presenter(s): Renat SADYKOV (*Joint Inst. for Nuclear Research (RU)*)
Location: Physikalisches Institut Heidelberg

10:30 Interplay between APPLGRID and HERAFitter

Presenter(s): Pavel STAROVOITOV (*Deutsches Elektronen-Synchrotron (DE)*), Dr. Mark SUTTON (*University of Sussex (GB)*)
Location: Physikalisches Institut Heidelberg

11:10 Interplay between APFEL and HERAFitter

Presenter(s): Valerio BERTONE (*CERN*), Stefano CARRAZZA (*Università degli Studi e INFN Milano (IT)*)
Location: Physikalisches Institut Heidelberg

11:30 Updates and plans for TMD PDFs in HERAFitter

Presenter(s): Hannes JUNG (*Deutsches Elektronen-Synchrotron (DE)*)
Location: Physikalisches Institut Heidelberg

11:50 Status and updates of the Bayesian reweighting in HERAFitter

Presenter(s): Alberto GUFFANTI (*Niels Bohr Institute*)
Location: Physikalisches Institut Heidelberg

Afternoon session:
Users' meeting and discussions

14:00 News from HERAFitter

Presenter(s): Ringaile PLACAKYTE (*Deutsches Elektronen-Synchrotron (DE)*), Voica Ana Maria RADESCU (*Ruprecht-Karls-Universitaet Heidelberg (DE)*)
Location: Physikalisches Institut Heidelberg

14:20 Updates to QCDNUM

Presenter(s): Michiel BOTJE (*NIKHEF (NL)*)
Location: Physikalisches Institut Heidelberg

14:40 News from APFEL and interface to HERAFitter

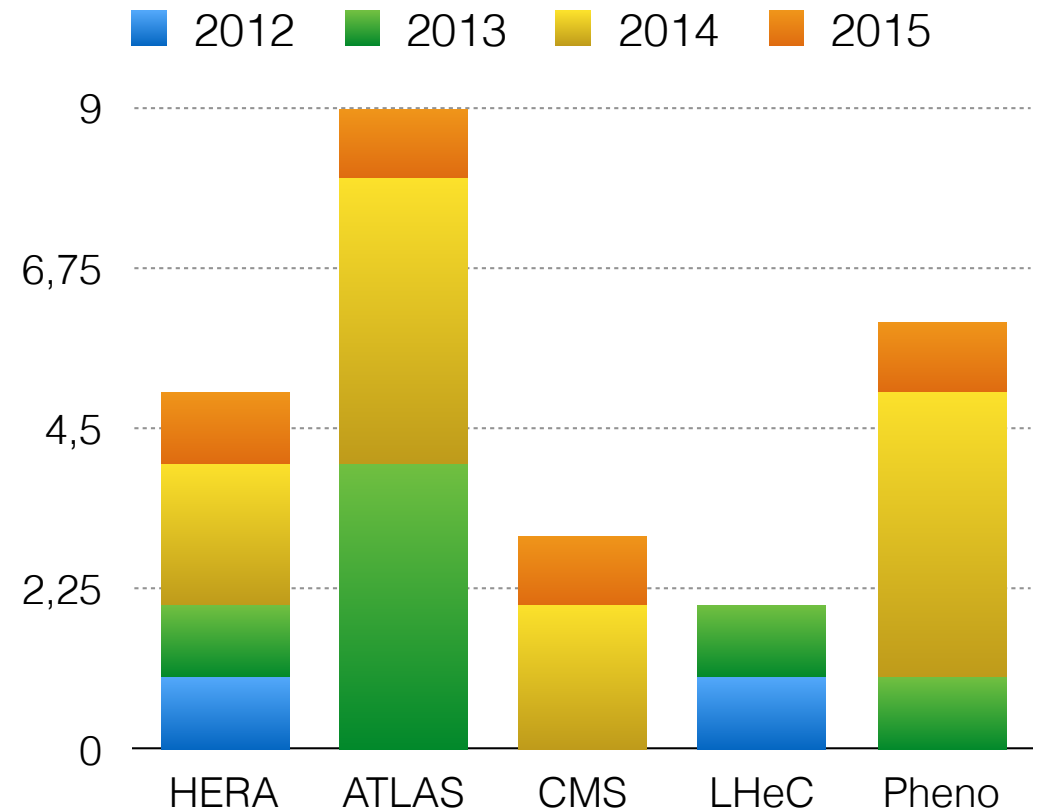
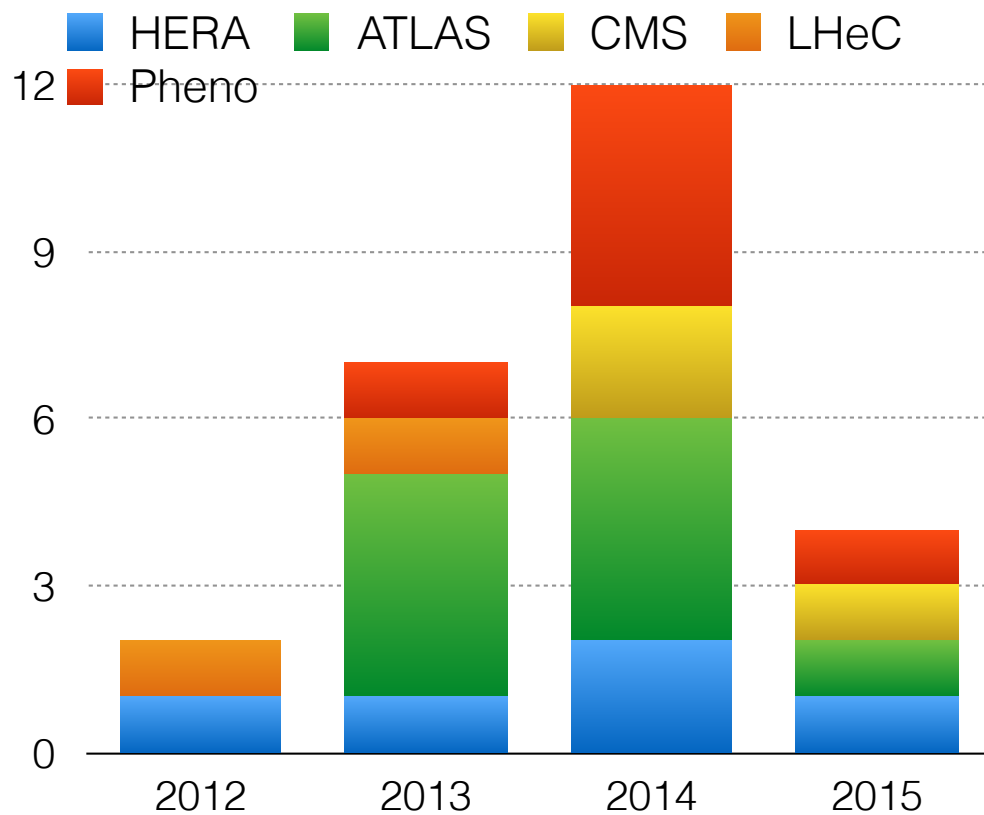
Presenter(s): Stefano CARRAZZA (*Università degli Studi e INFN Milano (IT)*)
Location: Physikalisches Institut Heidelberg

Afternoon session:
developers discussions 16:30 -18:30


Dinner: 19:30
<http://www.essighaus-heidelberg.com/>

List of analyses using HERAFitter




Date	Group	Reference	Title
NEW 05.2015	LHC/CMS	CMS PAS SMP-14-022	Measurement of the muon charge asymmetry in inclusive pp->W+X production at 8 TeV
NEW 03.2015	LHC/ATLAS	arXiv:1503.03709	Measurement of the forward-backward asymmetry of e and m pair-production in pp collisions at 7 TeV with the ATLAS detector
NEW 03.2015	PROSA	arXiv:1503.04581	Impact of the LHCb measurements of forward charm and beauty production on PDFs



List of analyses by HERAFitter

NEW 03.2015	HERAFitter team	to be submitted to EPJC, arXiv:1503.05221	 QCD analysis of W- and Z-boson production at Tevatron	Material
10.2014	HERAFitter team	submitted to EPJC, arXiv:1410.4412	 HERAFitter Open Source QCD Fit Project	
04.2014	HERAFitter team	EPJC (2014) 74: 3039, arXiv:1404.4234	 Parton distribution functions at LO, NLO and NNLO with correlated uncertainties between orders	Material

Candidate Analyses

Date	Project Name		Main Analysers	Target Conference
Jan 2014	Impact of LO/NLO/NNLO PDF correlations		H. Pirumov, M. Lisovyi, A. Gizko, S. Glazov	DIS 2014
Feb 2014	Study data compatibility and impact on PDFs from Tevatron		S. Camarda, Andreas Jung (Tevatron)	Summer 2014 - postponed to Spring 2015
May 2014	PDF parametrisation studies using various regularisation methods		H. Pirumov, V. Radescu, S. Glazov, A. Schoening	Summer 2014 - postponed to Spring 2015
Nov 2014	Determination of effective weak mixing angle using the forward-backward asymmetry data from LHC		A. Sapronov, S. Camarda, V. Myronenko (?), S. Glazov,	Spring 2015

-> reweighting/profiling benchmarking ?

-> nuclear PDFs ?

More detailed developments

- ✓ **Nightly checks of herafitter platform:**
 - Hayk has activated the nightly checks of HERAFitter
 - log mails sent to herafitter-help@desy.de
- ✓ **Datafiles restructure:**
 - finalisation the restructuring of the datafiles with proper correlation
- **Code developments towards herafitter-1.2.0 → aim for summer release**
 - ✓ APFEL complementary evolution: done (thanks to the APFEL team)
 - ✓ Profiled PDFs: done (thanks to Volodya, Sasha)
 - ✓ FONLL: done (thanks to Valerio)
 - Ongoing efforts:
 - ⚠ NNPdf reweighting code (Kristin)
 - ⚠ QED+QCD (Michiel, Renat for module, Voica for photon param)\
 - better c++ vs fortran interfaces for common blocks, memory handling (partially done)
 - **Possible additions:**
 - ⚠ Improve the storage of outputs: bypass the extra printout of pdfs, improve fitted results (Stefano, Hayk)
 - ⚠ add MNR (Sasha Z), inclusion of resummation codes, inclusion of Melin-space evolution and fast inverse Melin transformation
 - Heavy flavour schemes: ACOT@ NNLO, FFNS with different number of flavours (Marco, Oleg, Fred, Valerio, Olek)
 - ⚠ nuclear PDFs, studies of the LHC pPb and PbPb data.
 - generalised parametrisation (Volodya?)
 - Further numerical optimization, extended MPI support, usage of GPUs.
 - add software packages dependencies
 - Dedicated high-x studies. Extension to BSM processes (contact interactions, BSM particles in evolution)

Rename the project?

- **Often HERAFitter is confused with HERAPDF or HERA:**
 - **historically HERAFitter roots from H1Fitter platform from the H1 collaboration and was used initially for the H1 PDF sets and later on in collaboration with ZEUS was also used for HERAPDF sets**
 - **from 2011 HERAFitter became an open source platform decoupled from HERA, with currently most developers from the LHC environment (and sometimes even without HERA background).**
 - **Should we consider transitioning from HERAFitter to a more neutral name to avoid further future confusions and emphasize on the natural evolution to non-HERA?**
 - **if yes, please think of possible names that we could move to:**
 - **—> consequences: new logo wold be needed, minimal modifications to the src/ , tools/ and wiki's**