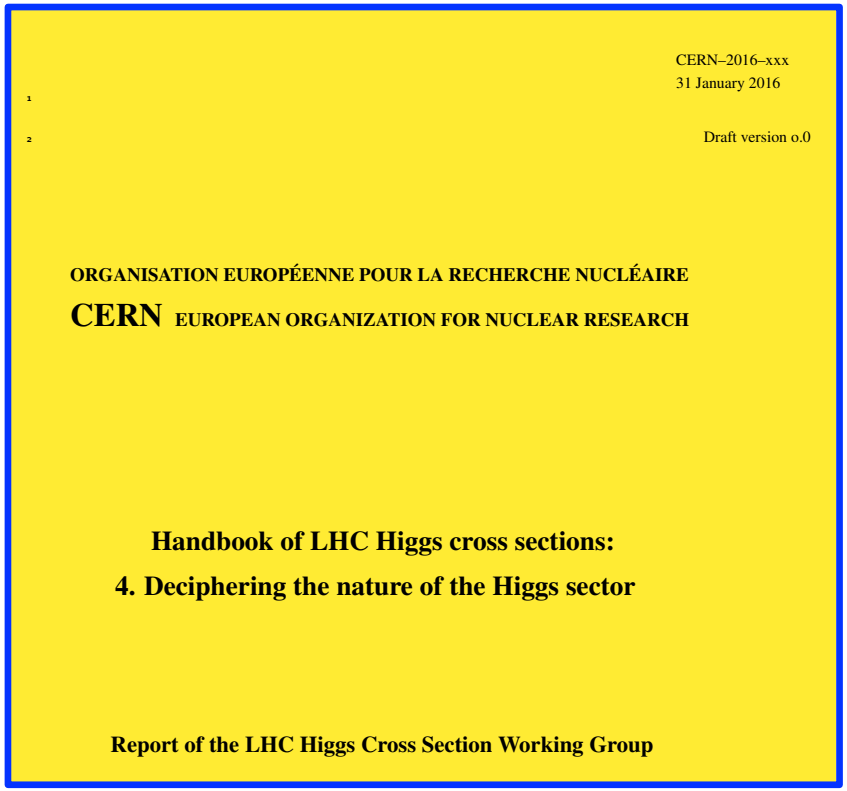
Introduction to 11th Workshop of the LHC Higgs Cross Section WG



CERN–2016–xxx
31 January 2016

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ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

Handbook of LHC Higgs cross sections:
4. Deciphering the nature of the Higgs sector

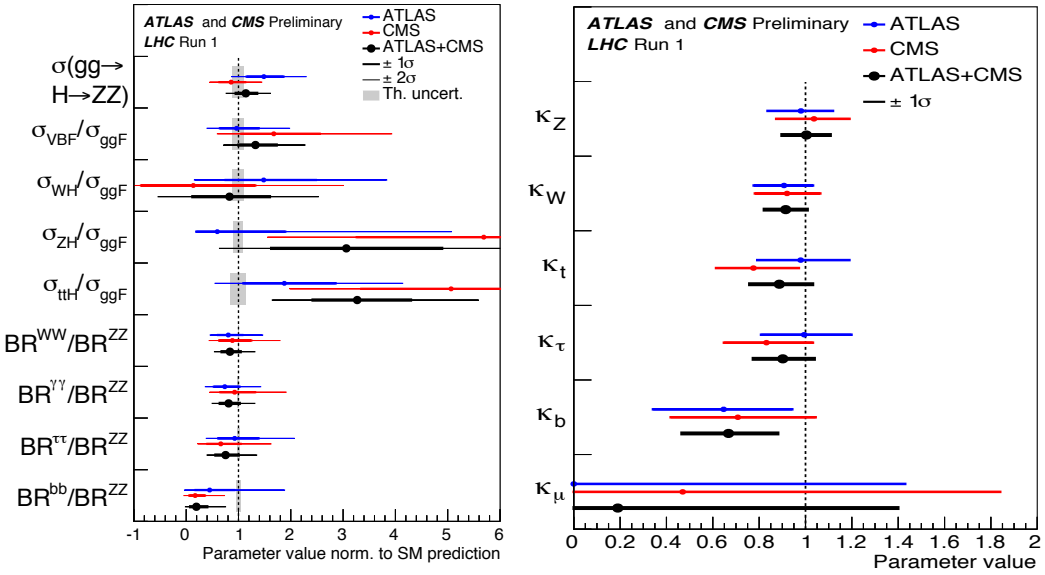
Report of the LHC Higgs Cross Section Working Group

CERN, Geneva
13 January 2016

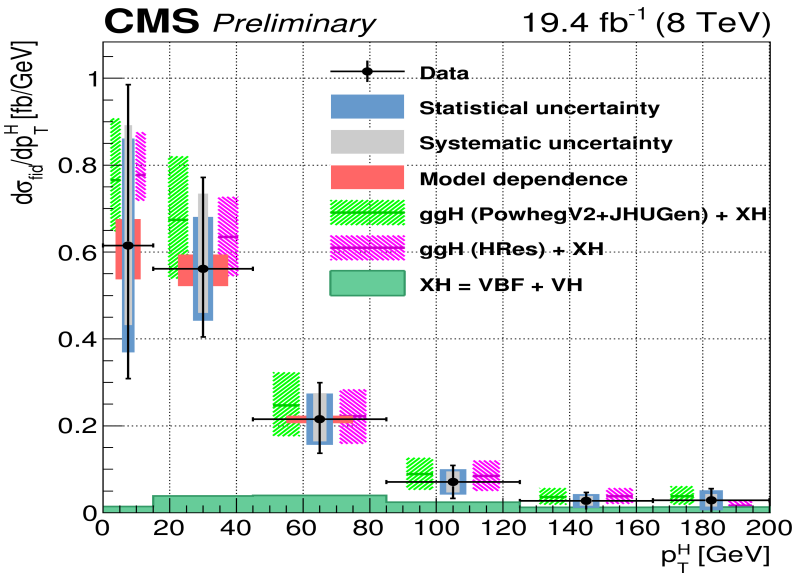
Markus Schumacher, Universität Freiburg
on behalf of the Steering Committee

A few Run 1 results still appearing (examples)

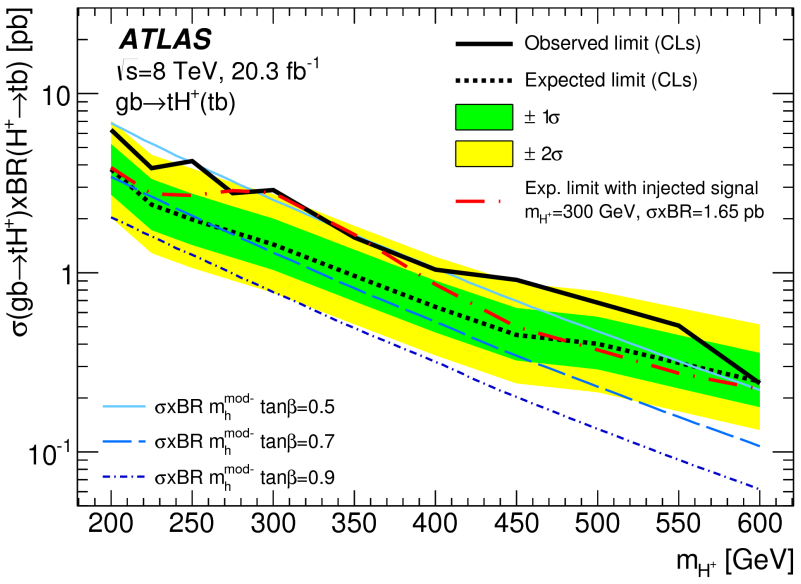
ATLAS+CMS
preliminary
“Coupling Combination”



CMS (prel),): P_T in H→WW



ATLAS: $H^{\pm} \rightarrow tb$

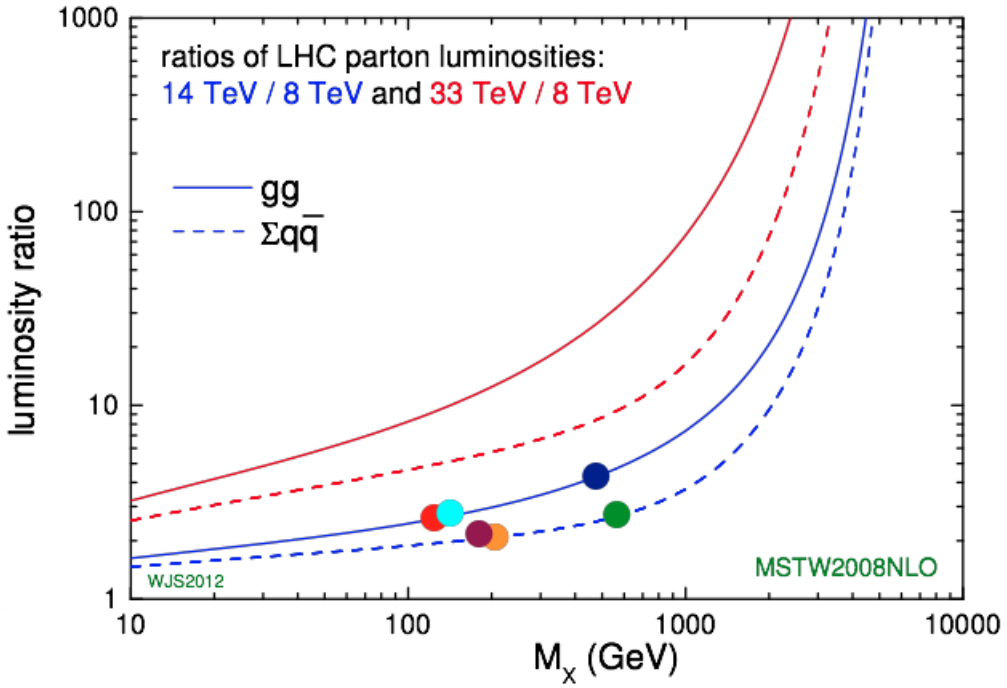


Higgs bosons in 2015 and 2016

	σ (13 TeV/8Tev)
gg→H	2.3
qq->Hqq	2.4
qq→WH	2.0
qq→ZH	2.0
gg→ttH	3.9

adapted from Reisaburo

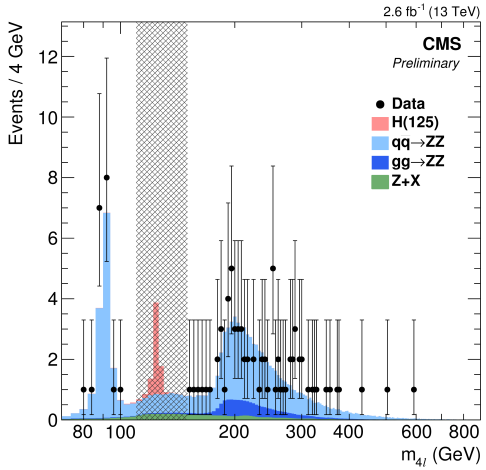
http://www.hep.ph.ic.ac.uk/~wstirlin/plots/plots.html

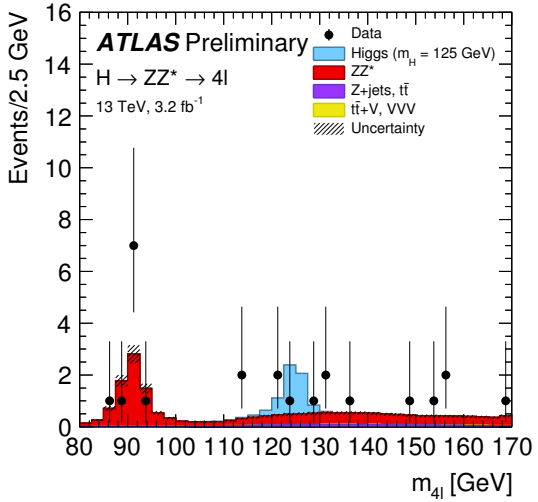


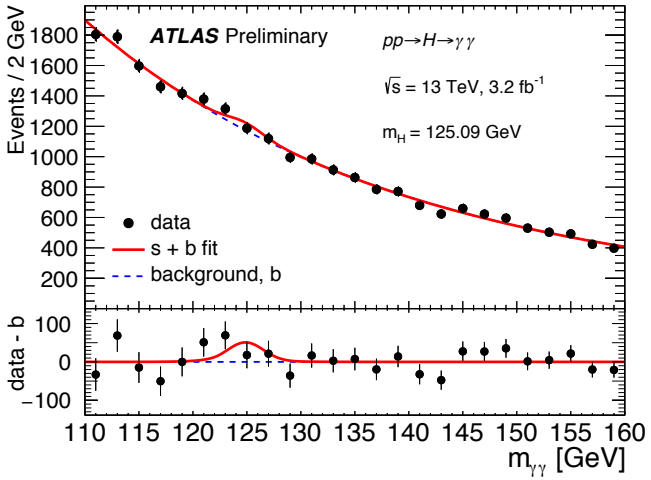
- 2015 data sets for analysis: ATLAS 3.2 fb^{-1} CMS 2.6 fb^{-1}
  - already 1/3 of Higgs boson events produced at 13 TeV compared to 8 TeV
  - already improved sensitivity in search for additional heavy Higgs bosons

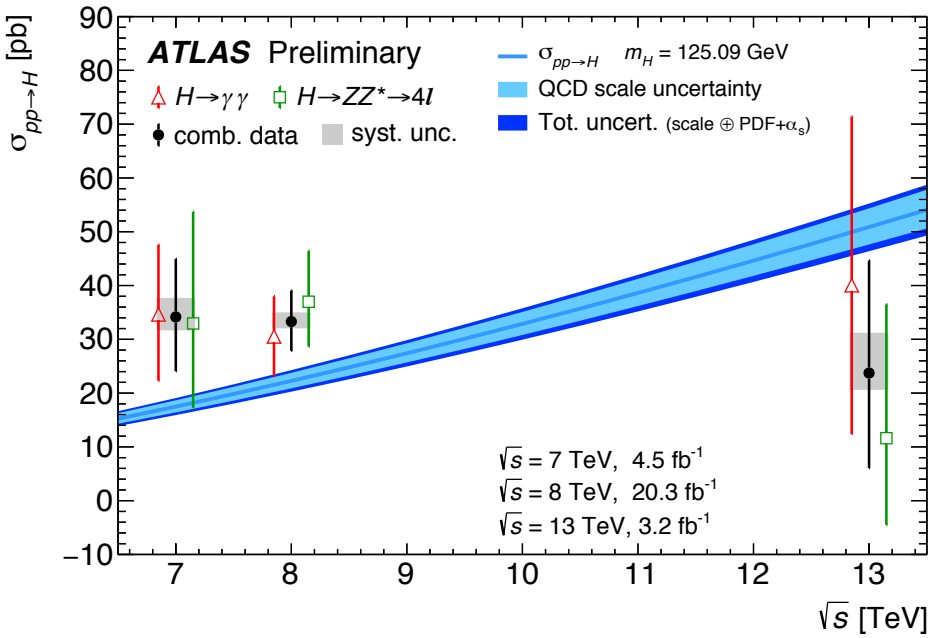
- 2016: > 30 fb^{-1} expected
  approx. 3 x number Run1 Higgs bosons (M=125 GeV) produced

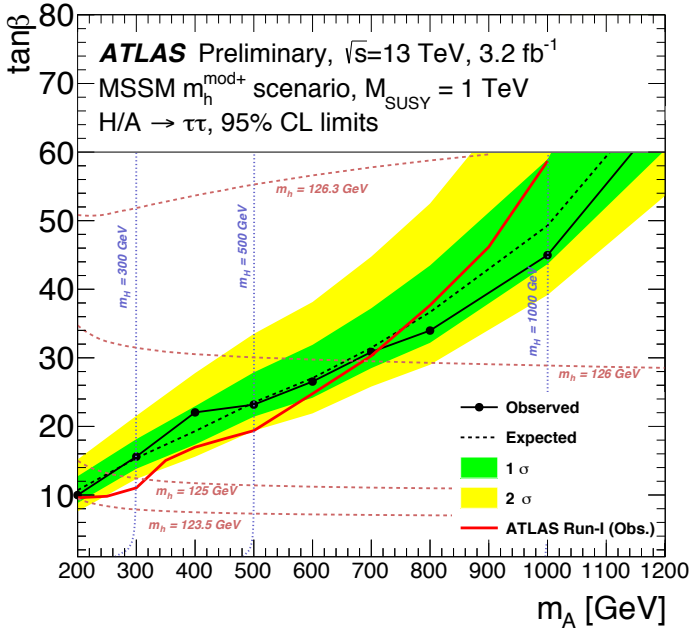
First 13 TeV results shown in December (Ex.)











LHC Schedule

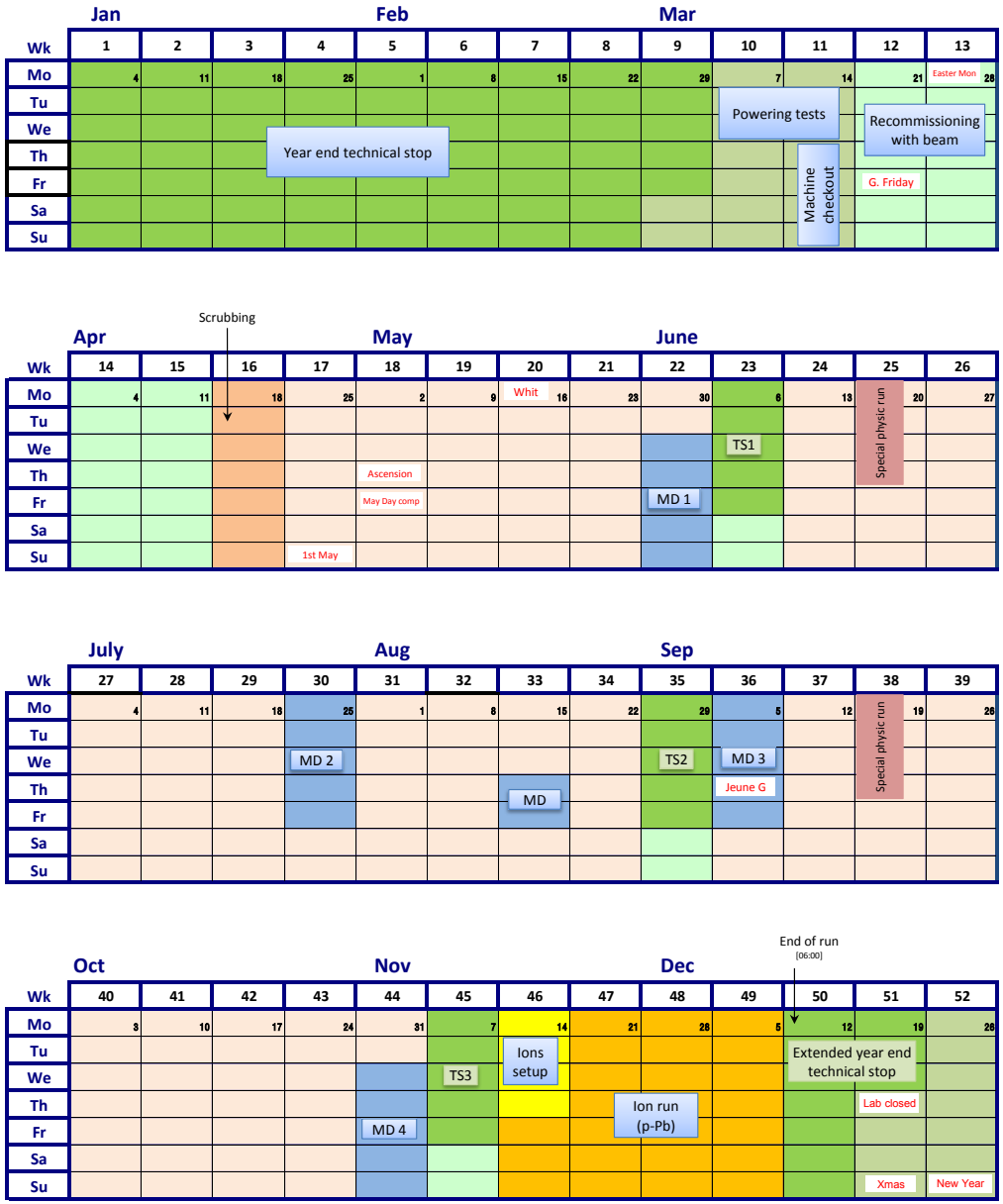
Current version 1.0

Full year:
152 days of pp collision
30 - 35 fb^{-1}

Until 1st July:
54 days of pp collisions
8-10 fb^{-1}

Until 23rd May
up to 4 weeks of pp collisions
1-2 fb^{-1}

pPb run starting on
18th November



adapted from Marumi Kado

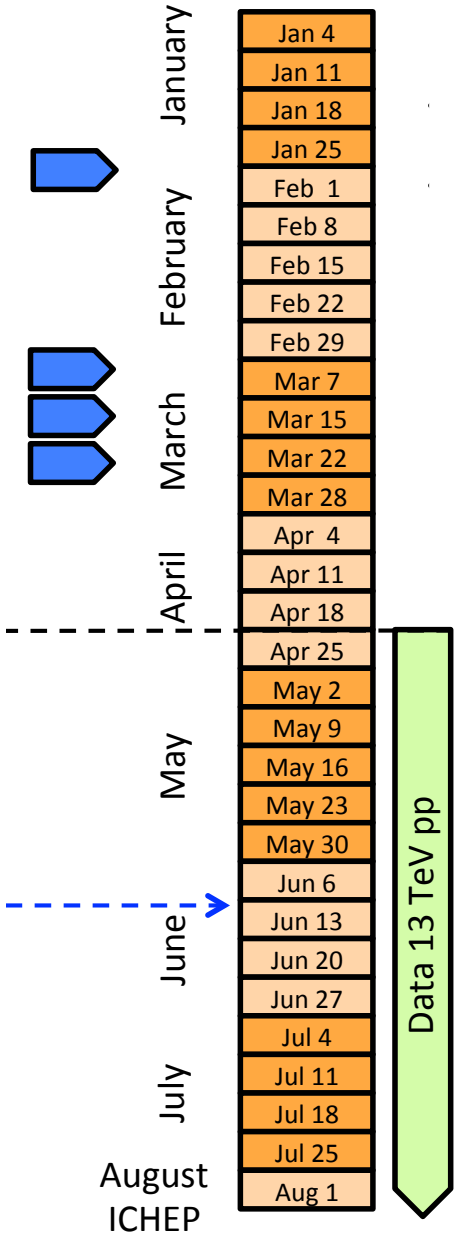
2016 Winter and Summer Schedule

Freezing/reviewing of analysis with 2015 data for spring conferences

La Thuile
Moriond EW
Moriond QCD

Start of 2016 pp run

LHCP (1-2 fb^{-1} delivered)



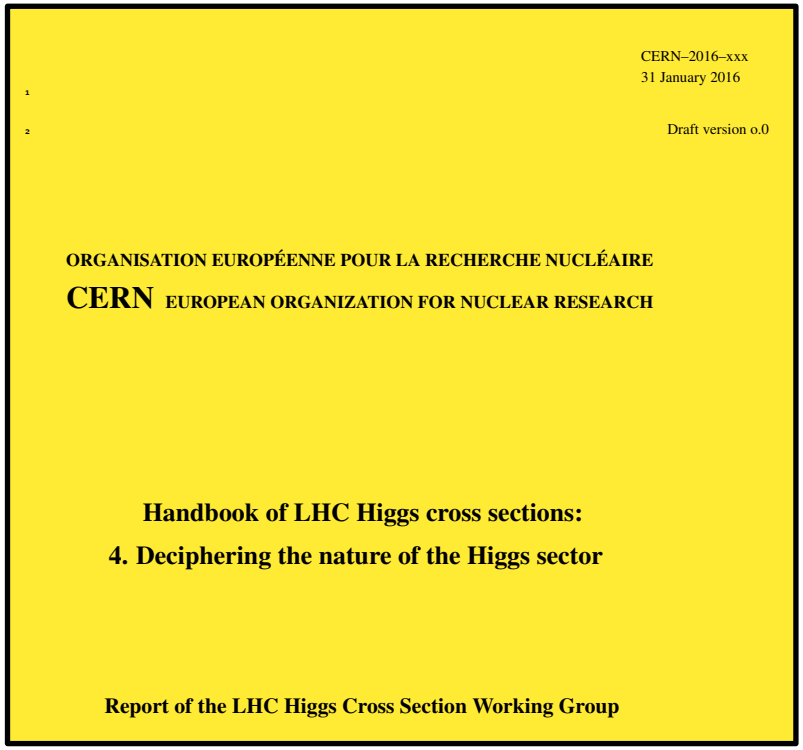
YR4:
1st complete draft

Final draft
Closing of SVN

Publication of YR4?

adapted from Marumi Kado

Finalizing Yellow Report 4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Handbook of LHC Higgs cross sections:
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Report of the LHC Higgs Cross Section Working Group

From E-mail sent on 23rd December:

Deadline for complete main text and at least preliminary numbers **31 January 2016**

with two exceptions:
a) discussion and recommendation for ggf cross section and related issues

b) surrounding text for pseudo observables and template/simplified cross sections

for the two exceptions and really final numbers the deadline is **29th February 2016**

Please put text in SVN as soon as you have it SVN will be closed on 1st March.

SC members will start reviewing / harmonizing the text as soon as it is available.
(Remark: Review = cooperation of WG convenors, chapter authors and SC)

Deadlines due to wish to have numbers and recommendations for summer conferences.

Numbers/Recommendations for Spring Analysis

From E-mail sent on 23rd December

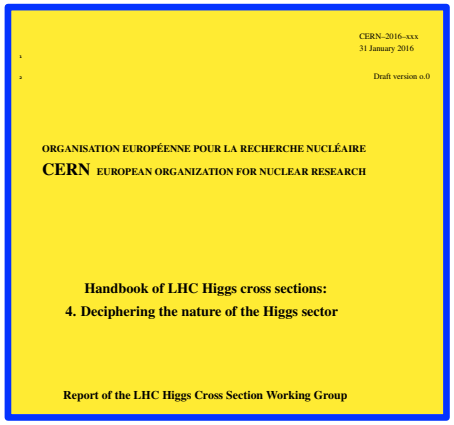
For analysis to be presented at Moriond the two experimental collaborations need numbers at the time scale of the January (13-15) workshop latest.

Cross sections at 13 TeV (even if preliminary) can be documented on wiki pages of the LHCHXSWG.

For ggF, in waiting for the final discussion and recommendations on the N3LO results (central values + uncertainties) in WG1, we suggest to provide updated numbers following the recommendation in YR3 with new PDF sets and recipes and new SM input parameters, especially for what concerns the HXS4BSM predictions. As soon as N3LO results will be blessed by WG1 these will be considered superseded.

For some contributions from WG3, which will enter Moriond analysis, we may also need recommendations in the format of a public note, which can be cited. We should decide at the time of the January meeting, whether and which new recommendations are needed as a pub note as an interim-solution before publication in YR4.

Goals of the Meeting



- Summarise status of activities to be documented in YR4 and discuss open and controversial issues

- Compile and decide on numbers and pre-recommendations to be used for spring 2016 analysis

- Collect and discuss ideas for activities beyond YR4 to keep momentum and to think ahead

- Proposed date for next workshop: 6 to 8 July at CERN (parallel to SUSY 2016, but best option before summer break)

Changes in the Steering Committee

Name	Comment
Charalampos „Babis“ Anastasiou	quit 23 December 2015
Christophe Grojean	succession will be discussed among TAC and SC theory members
Daniel de Florian	
Fabio Maltoni	
Alexandre „Sasha“ Nikitenko	
Chiara Mariotti → Marco Pieri	phasing over with YR4
Reisaburo „Rei“ Tanaka → Pierre Savard	replaced officially on 1st October 2015 Rei stays with us as editor etc for YR4
Markus Schumacher	will be replaced on 1st October 2016

Huge thanks to all SC members leaving / phasing out

In particular to founding members Chiara and Rei

Cordial welcome to Marco and Pierre

Replacement of TAC and theory SC members

Current theory Advisory Committee (TAC) members:

Sally Dawson,	Lance Dixon,	Nigel Glover,	NN
Zoltan Kunszt	Alex Pomarol Clotet,	Gavin Salam,	NN

Proposal developed by theory SC and TAC members

a) The 4 SC theory members have in general a term of 2 years.
2 are replaced each year. The ones leaving will become new TAC members.

b) The 8 TAC members have in general a term of 4 years.
2 are replaced each year by the outgoing SC theory members.

c) The TAC has the responsibility to consult the theory community and to chose new theory SC members

d) In cases where a TAC member leaves earlier than planned, theory SC and TAC members jointly choose a new TAC member

Among the TAC and all SC members (including the experimental ones), there should always be at least one from CERN, in order to provide a link with CERN management

Dinner in the traditional place on Thursday

- Thursday evening starting at 19:30
- Meet at 19:00 in front of building 39
- Chiara will collect money: 35 Euro or 40 CHF
- Please pay today/tomorrow at front-desk during breaks
- Receipt will be provided if required

Access cards

To people who need an access card and registered for it:

the badges will be available at the entrance of the main auditorium.

In Memoriam

Guido Altarelli 1941-- 2015

Scientist and Teacher

Friend and Colleague

We miss you

Instead of final words

Dr. John Watson: I wonder what desperate circumstances could occasion such an appeal.
Sherlock Holmes: I have devised seven separate explanations, each of which would cover the facts as far as we know them.
Dr. John Watson: Oh, and which one do you favour, Holmes?
Sherlock Holmes: At the moment, I have no favourites. Data, data, data! I cannot make bricks without clay!

Dr. John Watson: We cannot theorize without data, I'm afraid.

(A. C. Doyle, The Copper Beeches)

Fruitful and constructive discussions and enjoy the workshop!