

**Final Discussion Session
LHC H XS WG
CERN, 25 May 2012**

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Summary of 8 TeV XS

- ggF - ready
- VBF - next week
- VH - soon 1-2 week
- ttH - ready
- MSSM neutral - ready
- MSSM charged - soon

**!!!!!!WE NEED THESE NUMBERS ASAP
FOR ICHEP !!!!!**

ggF

From the study of the subgroup and the work done, the proposal is:

- Work with the numbers provided by dFG at NNLL, since they use the complex pole scheme and run from 80 to 1000 GeV following the LHCHXS prescription (SM inputs, PDF etc)
- iHixs will be cited as a independent calculation at NNLO that agree at 5% level for light Higgs (i.e. within the total uncertainty)

High Mass

- Lineshape:
implemented in Powheg and dFG code for inclusive XS.
- Interference: computed in gg2VV, MCFM (only WW) and HTO. Soon in aMC@NLO.

NEED A PRESCRIPTION on HOW TO INTERPRET HIGH MASS $H \rightarrow VV$ SEARCH taking into account the S+B interference

Low Mass

- Properties:

Present Data Precision:

SM couplings fitted naively

Future:

- 1) an effective Lagrangian that allow to test generally coupling that differ from 1.
- 2) Fit anomalous couplings at LO (~model independent approach)

Jets

New group: active!

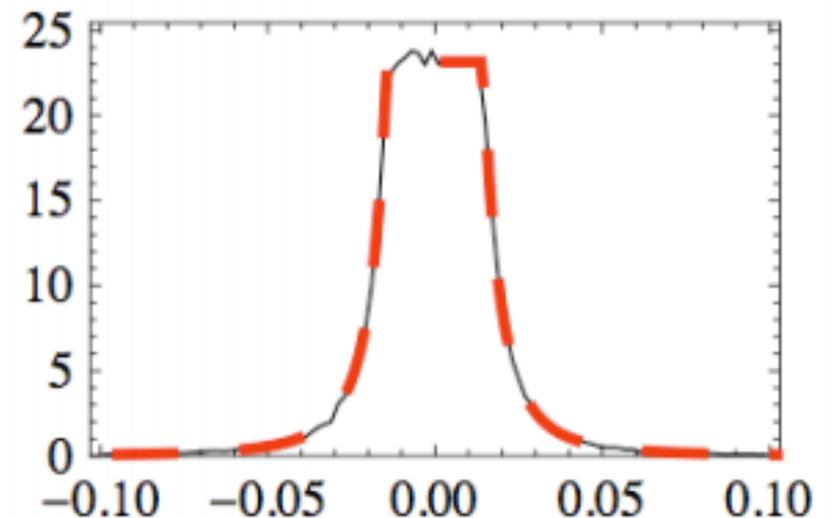
Exp need prescriptions but not always easy to do in a “general” way for all the cases.

TH need to know what we are doing to better help and give prescriptions.

→ need close collaboration between analyses experts, Jets experts and MC experts

THU

- Uncertainties from PDF will be treated separately for the need to correlate g and q PDF across processes.
- Scale Uncert: Log-norm ? Flat? ..?
a solution can be to use a distribution that is flat in the central part and has 2 tails
-> each XS group should give the size of:
the flat part (68% or 90% or ...?)
the tails.



Input to European Strategy

- Accelerator benchmark scenarios

LHC	\sqrt{s}	Luminosity
before upgrades	14 TeV	300 fb ⁻¹
High Luminosity	14 TeV	3000 fb ⁻¹
Energy Upgrade	33 TeV	300 fb ⁻¹

we need numbers before end of June!

CERN Report 3 ?

- Things might go fast in 2012 for light Higgs discovery or exclusion at ICHEP/Cracow/Council/Moriond.
- EXP's (and TH's) will be ultra-busy for this year.
- But it would be better to have CERN Report 3 as general guide for Higgs physics in coming years.
- New subgroups should make progresses soon, Higgs coupling, BSM, heavy Higgs, Jets, etc.
- Aim CERN Report 3 by Jan-Mar 2013 ?

Next meeting

- In October in conjunction with the TH institute at CERN ?
- Later on at the end of the LHC data taking ?
- UK, Lisbon, Hamburg ?

**THANKS TO ALL FOR THIS
VERY LIVELY MEETING**