Update of Limit Package on 81X

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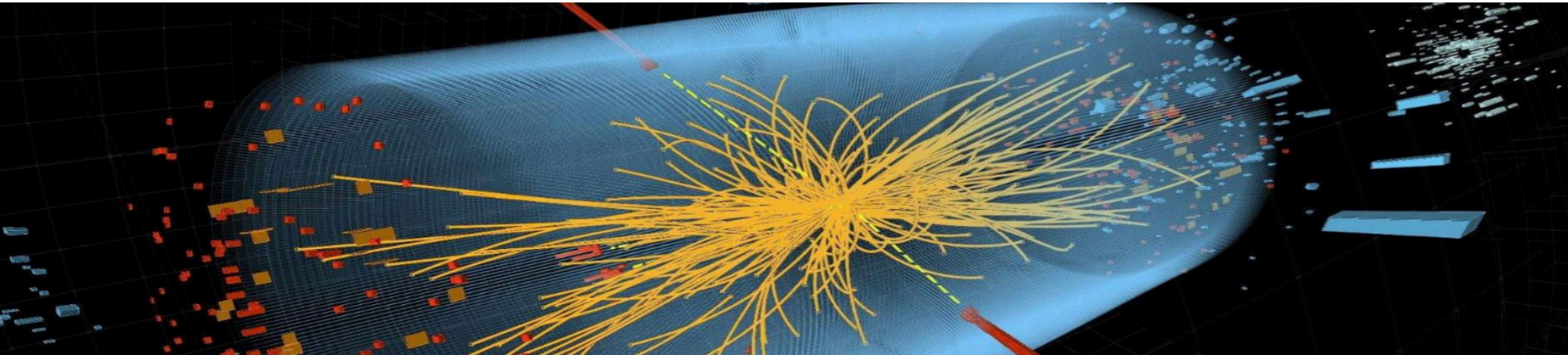

Outline

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- Summary

CombinedLimit

ROOT6 SLC6 release (CMSSW_8_1_X) - recommended version

Setting up the environment (once)

```
export SCRAM_ARCH=slc6_amd64_gcc530
cmsrel CMSSW_8_1_0
cd CMSSW_8_1_0/src
cmsenv
git clone https://github.com/cms-analysis/HiggsAnalysis-CombinedLimit.git HiggsAnalysis/CombinedLimit
cd HiggsAnalysis/CombinedLimit
```

Update to a reccomended tag - currently the reccomended tag is v7.0.7

```
cd $CMSSW_BASE/src/HiggsAnalysis/CombinedLimit
git fetch origin
git checkout v7.0.7
scramv1 b clean; scramv1 b # always make a clean build
```

You can generate a diff of any two tags (eg for `v7.0.7` and `v7.0.6`) by using following the url:

https://github.com/cms-analysis/HiggsAnalysis-CombinedLimit/compare/v7.0.6...v7.0.7

Replace the tag names in the url to any tags you which to compare.

https://cms-hcomb.gitbooks.io/combine/content/part1/#for-end-users-that-dont-need-to-commit-or-do-any-development

Fit

- The errors on the fits of these several functions:

CB function: rrv_n_CB

ErfExp function: rrv_c_ErfExp

Exp function: rrv_c_Exp

User1 function: rrv_p0、rrv_p1

ErfExpGaus function: rrv_c_ErfExp

2Exp function: rrv_frac_2Exp

Exp_sr function: rrv_c_Exp

ErfExp_v1/v2/v3 function: rrv_c_ErfExp

ErfExp_v3 function: rrv_high_ErfExp

ErfExpGaus_sp function: rrv_c_ErfExp

ErfExpVoigGaus function: rrv_c_ErfExp

The zero values of left bin or right bin might cause problems

Legend

Obj	objName
0	Powheg Sample
1	TTbar_Powheg
2	Uncertainty

- theObj = plot.getObject(obj)

```
            print objName
            if not (((plot.getInvisible(objName)) and (not TString(ob
jName).Contains("Uncertainty"))) or (obj == 1) or TString(objName).Co
ntains("invisi") or TString(objName).Contains("TLine") or objName ==
objName_before):
                print "############### legend6 ######################
##"
                theObj = plot.getObject(obj)
                print "############### legendcut1 ##################
#####"
```

- theLeg.AddEntry(theObj, objTitle, drawoption)

```
            else :
                print "###AddEntry3###"
                print obj
                print objName
                print drawoption
                print theObj
                try:
                    theLeg.AddEntry(theObj, objTitle, drawoption)
                except:
                    print "###Fail to AddEntry###"
        entryCnt = entryCnt+1
```

Combine Options

- combine -M Asymptotic --minimizerAlgo Minuit2 --minosAlgo stepping (-H ProfileLikelihood) (71X)

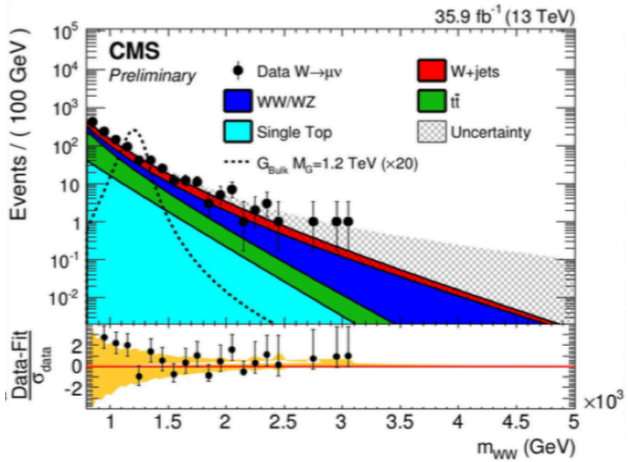
- combine -M AsymptoticLimits -cminDefaultMinimizerType Minuit2 --minosAlgo stepping (81X)

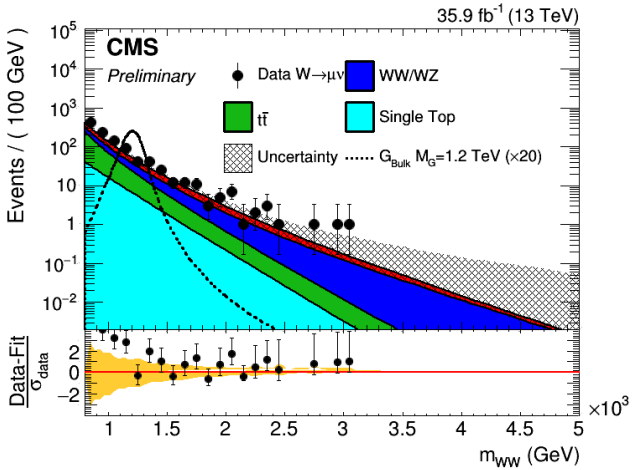
Others: Muon and Electron channel need to be analyzed simultaneously when calculating Limit using 81X

Results

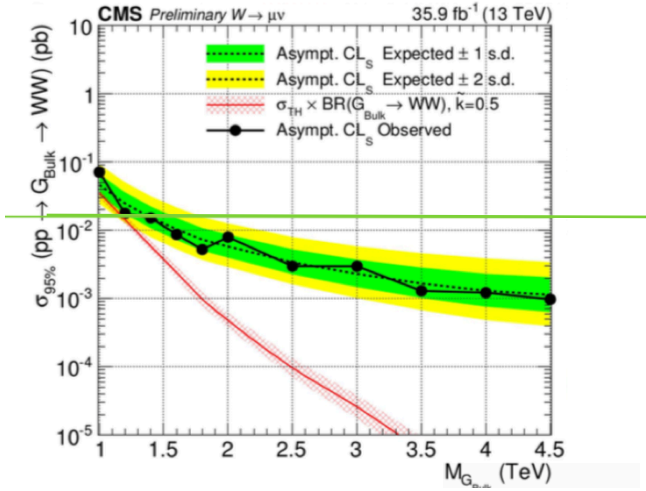
- Data: 2016 Single Muon (DNNW>0.98)

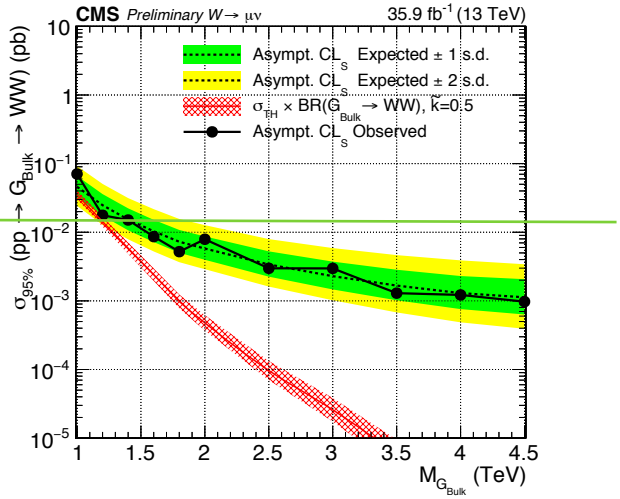
HP





HL





71X 81X

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