

Table of Contents

Cristina's Sandbox.....	1
Commands.....	2
Git.....	2
Commit.....	2
New branch.....	2
Screen (for analyzer.py).....	2
Polgrid LLR.....	3
Polgrid IRFU.....	3
Dasgoclient.....	3
Xrootd.....	3
Vim.....	3
Notes.....	4
ttH multileptons.....	4
LLR framework.....	4
Private production.....	4
Crab production.....	4
Helpers convert.....	5
Tree splitter.....	6
Datacard computation.....	6
Combine.....	6
Editing the AN.....	6
MEM.....	7
Installation.....	7
Package:.....	7
Instructions:.....	7
Adding new variables:.....	8
Commit to Git.....	8
GPU Platform @ CC-IN2P3.....	8
Log-in.....	9
Run interactively.....	9
Run on batch.....	9
LSI @ LLR.....	10
Log-in.....	10
Polui @ LLR.....	10
MEM output.....	10
L1 Tau Trigger.....	11
Production of ntuples.....	11
Merging offline and L1 taus.....	11
Matching offline and L1 taus.....	11
Create compressed tree.....	11
Produce the calibration LUT.....	11
Apply the calibration LUT.....	12
Produce the isolation LUT.....	12
Rate studies.....	12
Apply the isolation LUT.....	12
Combine - control analysis.....	12
Setup.....	12
Combined card.....	12
Workspaces.....	13
Significance:.....	13
Signal strength.....	13
Likelihood scan.....	14

Table of Contents

Notes

Impacts.....	14
Table of systematics.....	15
2D contours.....	15
Prefit plots.....	16
Postfit plots.....	17

Cristina's Sandbox

Commands

Git

Commit

git branch

git commit # get list of files that changed

git add < files > (or . for all files modified in the current directory)

git commit -m < comment > < files > (or without < files >)

git push origin < branch >

New branch

git checkout < oldbranch > #make sure you are in old branch

git checkout -b < newbranch > #create new branch and move into it

do your work

git commit -m < comment >

git push origin < newbranch >

Screen (for analyzer.py)

screen

/opt/exp_soft/vo.gridcl.fr/singularity/ui_sl6

voms-proxy-init -voms cms

source /cvmfs/cms.cern.ch/cmsset_default.sh

cd /home/ljr/cms/mperez/CMSSW_10_2_14/src/LLRHiggsTauTau/NtupleProducer/test

cmsenv

cmsRun *.py

Ctrl+A Ctrl+D

screen -list

screen -r < screen >

Kill screen: once connected to the session (screen -r) press Ctrl + A then type :quit.

Polgrid LLR

```
rmdir /path/to/folder
```

```
rmdir /dpm/in2p3.fr/home/cms/trivcat/store/user/cmartinp/
```

```
rfrm -r /path/to/folder
```

Remove folder without timeout errors (leave in the background):

```
gfal-rm -r -v
```

```
srm://polgrid4.in2p3.fr:8446/srm/managerv2?SFN=/dpm/in2p3.fr/home/cms/trivcat/store/user/cmartinp/ttH_Legacy/D  
> deletion.log
```

Check how much space I use in dpm:

```
/opt/exp_soft/cms/t3/gfal-du --path /dpm/in2p3.fr/home/cms/trivcat/store/user/cmartinp
```

Polgrid IRFU

```
export DPM_HOST=node12.datagrid.cea.fr
```

```
export DPNS_HOST=node12.datagrid.cea.fr
```

```
rmdir /dpm/datagrid.cea.fr/home/cms/trivcat/store/user/cmartinp/
```

```
root -l root://node12.datagrid.cea.fr:1094//dpm/datagrid.cea.fr/home/cms/trivcat/store/user/cmartinp/
```

Dasgoclient

```
dasgoclient --query="file
```

```
dataset=/DYJetsToLL_M-50_TuneCP5_13TeV-amcatnloFXFX-pythia8/RunIIFall17MiniAODv2-PU2017_12Apr201
```

Xrootd

```
root
```

```
root://xrootd-cms.infn.it//store/mc/RunIISummer16MiniAODv3/ttHTtoNonbb_M125_TuneCUETP8M2_ttHtranche3
```

Vim

<https://www.fprintf.net/vimCheatSheet.html> 

Notes

ttH multileptons

Twiki: https://gitlab.cern.ch/ttH_leptons/doc

LLR framework

https://github.com/LLRCMS/LLRHiggsTauTau/tree/94X_ttH

Installation:

https://github.com/LLRCMS/LLRHiggsTauTau/tree/94X_ttH#instructions-for-94x_tth

Ntuple producer:

<https://github.com/LLRCMS/LLRHiggsTauTau/blob/063c6c3be223e0322c2b60a842fae8f26b040449/NtupleProducer>

Run:

```
cmsRun analyzer.py
```

Output:

```
HTauTauAnalysis.root
```

Private production

Run interactively, having in `analyzer.py` :

```
'file:/data_CMS/cms/mperez/ttH_2017/THW/merged_THW001.root'
```

Crab production

Create a python config file for your sample to process: `crab3_XXX.py`

Modify the following entries:

```
config.General.requestName = 'HTauTau_MSSM_GGH300_21_09_15'
```

```
config.Data.inputDataset =  
'/SUSYGluGluToHToTauTau_M-300_TuneCUETP8M1_13TeV-pythia8/RunIISpring15DR74-Asympt25ns_MCRUN2_74_V
```

```
config.Data.outLFNDirBase =  
'/store/user/davignon/EnrichedMiniAOD/MSSM_GGH300_pFMET_prod_21_09_2015/'
```

```
config.Data.publishDataName = 'MSSM_GGH300_HTauTau_21_09_2015'
```

```
=config.Site.storageSite = 'T2_FR_GRIF_LLР' / 'T2_FR_GRIF_IRFU'
```

```
RUN_NTUPLIZER = False
```

```
SVFITBYPASS = False
```

```
IsMC = True
```

```
Is25ns = True
```

For data, specify the golden JSON:

```
config.Data.lumiMask =  
'https://cms-service-dqm.web.cern.ch/cms-service-dqm/CAF/certification/Collisions17/13TeV/ReReco/
```

Source crab:

```
voms-proxy-init -voms cms
```

```
source /cvmfs/cms.cern.ch/crab3/crab.sh
```

Launch production:

```
crab submit -c crab3_XXX.py
```

Monitor jobs:

```
crab status -d crab3//
```

or in:

<http://dashb-cms-job-task.cern.ch/dashboard/request.py/taskmonitoring>

Relaunch failed jobs:

```
crab resubmit -d crab3//
```

Delete jobs:

```
crab kill -d
```

Grid space (LLR):

```
rfdird /dpm/in2p3.fr/home/cms/trivcat/store/user/cmartinp/
```

Grid space (IRFU):

```
gfal-ls  
root://node12.datagrid.cea.fr//dpm/datagrid.cea/home/cms/trivcat/store/user/cmartinp/
```

Helpers convert

This step will add additional variables with respect to the LLRHiggsTauTau NtupleProducer.

<https://github.com/cmarper/ttH/tree/master/macros>/https://github.com/cmarper/ttH/blob/master/macros/Helpers_convert

To run on LLR Tier3:

https://github.com/tstreble/MEM_Analysis/blob/master/ttH/macros/Helpers_convert_ttH_v6.C

Tree splitter

This step takes care of skimming the existing ntuples, building different trees for the different regions used for the signal and background estimations (both for the ttH multilepton and tau categories).

https://github.com/cmarper/ttH/blob/master/macros/tree_splitter_2017_v9.C

To run on LLR Tier3:

https://github.com/tstreble/MEM_Analysis/blob/master/ttH/macros/launch_split_jobs_tier3.C

Datacard computation

Compute datacards combining the yields/systematics from all the ntuples (one per category):

https://github.com/cmarper/ttH/blob/master/macros/datacard_maker_2lSS1tau_2017_antiEle_v2.C

Combine

Installation:

<https://github.com/cms-analysis/CombineHarvester>

<https://twiki.cern.ch/twiki/bin/viewauth/CMS/SWGuideHiggsAnalysisCombinedLimit>

Install in `CMSSW_7_4_7/src/CombineHarvester/ttH_htt/bin/` the code like in:

https://github.com/tstreble/MEM_Analysis/blob/master/ttH/macros/WriteDatacards_2lss_1tau_ttH_comb.cpp

This can be used then with standard combine commands like the ones in:

https://github.com/tstreble/MEM_Analysis/blob/master/ttH/macros/make_ttH_htt_ttH_comb.sh

Editing the AN

AN: AN-19-111 (<https://gitlab.cern.ch/tdr/notes/AN-19-111>)

Configure git client:

```
scl enable rh-git29 bash # this allows you to access a recent version of git. It will place you in a bash shell.
```

```
git config --global user.name "Cristina Martin Perez"
```

```
git config --global user.email "cmartinp@cern.ch"
```

```
# failure to set the next option can lead to the message
```

```
# 'Basic: Access denied'
```

```
# if you use KRB access (http)
```

```
git config --global http.emptyAuth true
```


Edit the AN:

```
=git clone --recursive https://:@gitlab.cern.ch:8443/tdr/notes/AN-19-111.git =
```

```
cd /afs/cern.ch/user/c/cmartinp/Legacy/AnalysisNote/AN-19-111
```

```
eval utils/tdr runtime # add -sh for bash; -csh for csh; -fish for fish. Default is csh  
(for now).
```

```
# (edit the template, then to build the document)
```

```
./utils/tdr --style=note b # the local document with the name of the directory is the default build  
target=
```

```
# we also recommend setting the output directory using either the command line option --temp_dir or the env  
var TDR_TMP_DIR (new from svn version)
```

```
# to commit changes back...
```

```
git add . # add all files modified in current directory
```

```
git commit -m "add my new changes" # to stage your changes
```

```
git push # to send them back to the repo
```

MEM

Installation

Package:

https://llrgit.in2p3.fr/mem-group/CMS-MEM/tree/OpenCL_ttH_Run2_2017

Instructions:

```
mkdir MEM-Project
```

```
cd MEM-Project
```

```
git clone git@llrgitNOSPAMPLEASE.in2p3.fr:mem-group/CMS-MEM.git
```

```
cd CMS-MEM
```

```
git checkout OpenCL_ttH_Run2_2017
```

```
#ln -s Env/CC_slc7_amd_amd64_gcc530.env cms-mem.env #this will create the wrong CUDA  
environment for compilation!
```

```
#ln -s Env/make.inc.cc make.inc #this will create the wrong CUDA environment for compilation!
```

```
cd xxx/CMS-MEM
```

```
./cms-mem.env
```

```
cd MGMEM/
```

TestTopic11111180 < Sandbox < TWiki

```
qlogin before compiling: qlogin -l GPU=1 -l GPUtype=K80 -q mc_gpu_interactive -pe multicores_gpu 4
```

```
make clean; make
```

Adding new variables:

Changes to be made in directory ./IOLib/ :

- Scalar variables:

```
EventReader_impl_Run2.cpp: ok = ok && ! tchain->SetBranchAddress( "bTagSF_weight_up", &_bTagSF_weight_up );
```

```
EventReader_impl_Run2.cpp: eventData._bTagSF_weight_up = _bTagSF_weight_up;
```

```
IntegralsOutputs_Run2.cpp: ttree->Branch("bTagSF_weight_up", &_bTagSF_weight_up, "bTagSF_weight_up/F");
```

```
IntegralsOutputs_Run2.cpp: _bTagSF_weight_up = ev->_bTagSF_weight_up;
```

```
Run2EventData_t.cpp: _bTagSF_weight_up = evData->_bTagSF_weight_up;
```

```
Run2EventData_t.h: float _bTagSF_weight_up;
```

- Vectorial variables:

```
EventReader_impl_Run2.cpp: ok = ok && ! tchain->SetBranchAddress( "recotauh_sel_phi", &p_recotauh_sel_phi);
```

```
EventReader_impl_Run2.cpp: eventData._recotauh_sel_phi = _recotauh_sel_phi;
```

```
IntegralsOutputs_Run2.cpp: ttree->Branch("recotauh_sel_phi", &_recotauh_sel_phi);
```

```
IntegralsOutputs_Run2.cpp: _recotauh_sel_phi = ev->_recotauh_sel_phi;
```

```
Run2EventData_t.cpp: _recotauh_sel_phi = evData->_recotauh_sel_phi;
```

```
Run2EventData_t.cpp: p_recotauh_sel_phi = &_recotauh_sel_phi;
```

```
Run2EventData_t.h: vector _recotauh_sel_phi;
```

```
Run2EventData_t.h: vector* p_recotauh_sel_phi;
```

Commit to Git

```
git status
```

```
git commit -a -m comment
```

```
git push -v -u origin OpenCL_ttH_Run2_2017
```

GPU Platform @ CC-IN2P3

Twiki: <https://llrgit.in2p3.fr/mem-group/CMS-MEM/wikis/batch-CC-cluster>

Instructions:

Log-in

```
ssh -XY mperez@ccaNOSPAMPLEASE.in2p3.fr
```

```
qlogin -l GPU=1 -l GPUtype=K80 -q mc_gpu_interactive -pe multicores_gpu 4
```

```
. /usr/local/shared/bin/ge_env.sh
```

```
. ./cms-mem.env
```

Log-in with cmsf group:

```
groups
```

```
newgrp cmsf
```

Config file:

```
MGMEM/cristina.py
```

Input file: InputFileList

Output file: FileOfIntegrals

sps space:

```
/sps/cms/mperez
```

Run interactively

```
cd MGMEM/
```

```
mpirun -n 2 ./MG-MEM-MPI cristina.py
```

with:

```
OCLConfig.py:
```

```
SelectedQueues = [ True, False, False, False, False, False, False]
```

```
KernelExecMode = 1
```

Run on batch

```
cd BatchModel /
```

2 nodes:

```
qsub -l GPU=4 -l GPUtype=K80 -q pa_gpu_long -pe openmpigpu_4 8 batch.sh
```

1 node:

```
qsub -l GPU=4 -l GPUtype=K80 -q pa_gpu_long -pe openmpigpu_4 4 batch.sh
```

with:

```
OCLConfig.py:
```

Log-in

TestTopic11111180 < Sandbox < TWiki

```
SelectedQueues = [ True, True, True, True, False, False, False]
```

```
KernelExecMode = 1
```

Check jobs:

```
qstat
```

More info about batch submission:

https://doc.cc.in2p3.fr/utiliser_le_systeme_batch_ge_depuis_le_centre_de_calcul#jobs_gpu_paralleles

To run multiple jobs:

```
cd CMS-MEM/MGMEM
```

```
cp -rf BatchModel BatchModel _XXX
```

```
cd BatchModel _XXX
```

```
#change cristina.py, OCLConfig.py
```

```
cp batch.sh batch_XXX.sh (useful for job survey)
```

To run interactively: `./batch_XXX.sh`

To run on batch (1 nodes): `qsub -l GPU=4 -l GPUtype=K80 -q pa_gpu_long -pe openmpigpu_4 4 batch_XXX.sh`

To run on batch (2 nodes): `qsub -l GPU=4 -l GPUtype=K80 -q pa_gpu_long -pe openmpigpu_8 4 batch_XXX.sh`

LSI @ LLR

<https://llrlsi-git.in2p3.fr/llrlsi/for-users/wikis/home>

Log-in

```
ssh -XY cmartinp@cmsusrNOSPAMPLEASE.cern.ch
```

sps space:

```
/sps/mperez
```

Polui @ LLR

<https://llrgit.in2p3.fr/mem-group/CMS-MEM/wikis/git-commands>

Installed in `/home/llr/cms/mperez/MEM-Project/CMS-MEM`

MEM output

No missing jet:

```
T->Draw("Integral_ttH/(Integral_ttH+1e-18*(Integral_ttbar_DL_fakelep_tlep+Integral_ttbar_DL_fakel
```

Run on batch

Missing jet:

```
T->Draw("Integral_ttH/(Integral_ttH+5e-15*(Integral_ttbar_DL_fakelep_tlep+Integral_ttbar_DL_fakelep_tlep))  
integration_type==1")
```

L1 Tau Trigger

L1 CMSSW:

<https://twiki.cern.ch/twiki/bin/view/CMSPublic/SWGuideL1TStage2Instructions>

Tau Tag&Probe package:

<https://github.com/davignon/TauTagAndProbe>

Production of ntuples

- Offline: `cmsRun test_noTagAndProbe.py`
- L1 (with re-emulation): `cmsRun reEmulL1_MC_L1Only.py`
- ZeroBias: `reEmulL1_ZeroBias.py`

Merging offline and L1 taus

- config files in `/run/VBFStage2_WithJune2017_Jets_05_10_17.config`
- compile under CMSSW: `make clean; make`
- run: `./merge.exe run/VBFStage2_WithJune2017_Jets_05_10_17.config`

Matching offline and L1 taus

- script: `MakeTreeForCalibration.C`

Create compressed tree

- need the files: `LUTs_06_09_16_NewLayer1_SK1616` and `compressionLuts`
- run: `python produceTreeWithCompressedIetaEShape_NewFormat.py`

Produce the calibration LUT

- directory: `/home/llr/cms/mperez/RegressionTraining/CMSSW_7_6_0/src/RegressionTraining`
- BDT config file:
`GBRFullLikelihood_Trigger_Stage2_2017_compressedieta_compressediet_hasEM_isMerged_MC_SandeepCristina_MC_VBF.config`
- compilation; `=make clean; make'`
- run: `./regression.exe GBRFullLikelihood
_Trigger_Stage2_2017_compressedieta_compressediet_hasEM_isMerged_MC_SandeepCristina_MC_VBF.config`

- make histo with calibration constants: python
makeTH4_Stage2_2017_compressedieta_compressediet_hasEM_isMerged_MC_VBF

- result in corrections/

- produce LUT: MakeTauCalibLUT_MC_NewCompression_WithMarch2017Layer1.C

Apply the calibration LUT

- apply calibration: ApplyCalibration.C

Produce the isolation LUT

- get isolation cuts:

Build_Isolation_WPs_MC_NewCompression_Thomas_nTT_OlivierFlatWP_With2017Layer1.C

- perform the relaxation: Fill_Isolation_TH3_MC_2017Layer1Calibration.C

- produce LUT: MakeTauIsoLUT_MC_NewCompression_WithMarch2017Layer1.C

Rate studies

- Use ZeroBias ntuples.

- Apply calibration: ApplyCalibrationZeroBias.C

- Compute rates: Rate_ZeroBias_Run305310.C

- Plot rate comparison and get thresholds for a certain rate: CompareRates_Run305310.C

Apply the isolation LUT

- Apply isolation: ApplyIsolationForTurnOns.C

- Plot turnons: CompareTurnOns_2017Layer1Calibration_ShapeVeto_AdaptedThreshold.C

Combine - control analysis

Setup

In lxplus. Increase stack memory:

```
cmsenv; ulimit -s unlimited
```

Combined card

Make combined card:

```
combineCards.py $(for fil in `ls *.txt`; do echo -n ${fil/.txt/}=${fil} \ ;done) >  
combined_cards.dat
```

For FitDiagnostics (used in plots) declare the naming of the subcategories use script [here](#)

Workspaces

Inclusive:

```
text2workspace.py combined_cards.dat -o ttHmultilep_WS.root -P
HiggsAnalysis.CombinedLimit.PhysicsModel:multiSignalModel --PO verbose --PO
'map=.*TTW.*:r_ttW[1,0,6]' --PO 'map=.*TTWW.*:r_ttW[1,0,6]' --PO 'map=.*TTZ.*:r_ttZ[1,0,6]' --PO
'map=.*ttH.*:r_ttH[1,-1,3]'
```

Per category:

```
text2workspace.py combined_cards.dat -o ttHmultilep_WS_perchannel.root -P
HiggsAnalysis.CombinedLimit.PhysicsModel:multiSignalModel --PO verbose --PO
'map=.*TTW.*:r_ttW[1,0,6]' --PO 'map=.*TTWW.*:r_ttW[1,0,6]' --PO 'map=.*TTZ.*:r_ttZ[1,0,6]' --PO
'map=.*ttH_2lss_0tau.*:r_ttH_2lss_0tau[1,-5,10]' --PO
'map=.*ttH_3l_0tau.*:r_ttH_3l_0tau[1,-5,10]' --PO 'map=.*ttH_4l.*:r_ttH_4l[1,-5,10]' --PO
'map=.*ttH_2lss_1tau.*:r_ttH_2lss_1tau[1,-5,10]'
```

Significance:

Inclusive:

```
combineTool.py -M Significance --signif ttHmultilep_WS.root --redefineSignalPOI r_ttH (-t
-1 --setParameters r_ttH=1,r_ttW=1,r_ttZ=1) -m 125 -n .significance.all
```

Per category:

```
combineTool.py -M Significance --signif ttHmultilep_WS_perchannel.root
--redefineSignalPOI r_ttH_2lss_0tau (-t -1 --setParameters
r_ttH_2lss_0tau=1,r_ttH_3l_0tau=1,r_ttH_2lss_1tau=1,r_ttH_4l=1,r_ttW=1,r_ttZ=1) -m 125 -n
.significance.2lss0tau
```

```
combineTool.py -M Significance --signif ttHmultilep_WS_perchannel.root
--redefineSignalPOI r_ttH_2lss_1tau (-t -1 --setParameters
r_ttH_2lss_0tau=1,r_ttH_3l_0tau=1,r_ttH_2lss_1tau=1,r_ttH_4l=1,r_ttW=1,r_ttZ=1) -m 125 -n
.significance.2lss1tau
```

```
combineTool.py -M Significance --signif ttHmultilep_WS_perchannel.root
--redefineSignalPOI r_ttH_3l_0tau (-t -1 --setParameters
r_ttH_2lss_0tau=1,r_ttH_3l_0tau=1,r_ttH_2lss_1tau=1,r_ttH_4l=1,r_ttW=1,r_ttZ=1) -m 125 -n
.significance.3l0tau
```

```
combineTool.py -M Significance --signif ttHmultilep_WS_perchannel.root
--redefineSignalPOI r_ttH_4l (-t -1 --setParameters
r_ttH_2lss_0tau=1,r_ttH_3l_0tau=1,r_ttH_2lss_1tau=1,r_ttH_4l=1,r_ttW=1,r_ttZ=1) -m 125 -n
.significance.4l0tau
```

Signal strength

Inclusive:

```
combine -M MultiDimFit --algo singles ttHmultilep_WS.root (-t -1 --setParameters
r_ttW=1,r_ttZ=1,r_ttH=1) -m 125 -n .mu.all
```

Per category:

```
combine -M MultiDimFit --algo singles ttHmultilep_WS_perchannel.root (-t -1
--setParameters
```

```
r_ttW=1,r_ttZ=1,r_ttH_2lss_0tau=1,r_ttH_3l_0tau=1,r_ttH_4l=1,r_ttH_2lss_1tau=1) -m 125 -n .mu.cats
```

Likelihood scan

Inclusive likelihood scan with syst and stats:

```
combineTool.py -M MultiDimFit --algo grid --points 100 --rMin 0 --rMax 3
ttHmultilep_WS.root --alignEdges 1 --floatOtherPOIs=1 -P r_ttH (--setParameters
r_ttH=1,r_ttZ=1,r_ttW=1 -t -1) -n .likelihoodscan --saveWorkspace
```

Plot inclusive likelihood scan:

```
plot1DScan.py all.root --POI r_ttH --y-cut 50 --y-max 50
```

Get statistical only component:

```
combine -M MultiDimFit higgsCombine.likelihoodscan.MultiDimFit.mH125.root -n
.likelihoodscan.freezeAll -m 125 --rMin 0 --rMax 3 --algo grid --points 30
--freezeParameters allConstrainedNuisances --snapshotName MultiDimFit --alignEdges 1
--floatOtherPOIs=1 -P r_ttH
```

Plot breakdown stat and syst:

```
plot1DScan.py higgsCombine.likelihoodscan.MultiDimFit.mH125.root --POI r_ttH --y-cut 50
--y-max 50 --breakdown syst,stat --others
"higgsCombine.likelihoodscan.freezeAll.MultiDimFit.mH125.root:Stat only:2"
```

Impacts

a) Initial fit for each POI:

```
combineTool.py -M Impacts -d ttHmultilep_WS.root --doInitialFit --robustFit 1 (-t -1
--setParameters r_ttH=1,r_ttZ=1,r_ttW=1 -m 125) -n t1 --redefineSignalPOIs r_ttH
--floatOtherPOIs 1
```

b) Comment "FixAll()" in CombineHarvester/CombineTools/python/combine/Impacts.py and CombineHarvester/CombineTools/combine/utils.py

c) Fit scan for each nuisance:

```
combineTool.py -M Impacts -d ttHmultilep_WS.root --robustFit 1 --doFits (-t -1
--setParameters r_ttH=1,r_ttZ=1,r_ttW=1) -m 125 -n t1 --redefineSignalPOIs r_ttH
--job-mode condor
```

d) Kill the submitted jobs:

```
condor_rm cmartinp
```

e) Add in condor_combine_task.sub the following lines before "queue":

```
periodic_remove = False
```

```
+JobFlavour = "tomorrow" (or "nextweek")
```

f) Submit the jobs:

```
condor_submit condor_combine_task.sub
```


g) Monitor the jobs:

```
condor_q
```

h) Check the failed impacts with this script [↗](#)

Re-run failed impacts with the options: `--cminDefaultMinimizerStrategy 0` or `--X-rtd MINIMIZER_MaxCalls=999999999`

h) Collect outputs when jobs are done:

```
combineTool.py -M Impacts -d ttHmultilep_WS.root -o impactst1.json (-t -l --setParameters r_ttH=1,r_ttZ=1,r_ttW=1) -m 125 -n t1 --redefineSignalPOIs r_ttH
```

i) Plot impacts:

```
plotImpacts.py -i impactst1.json -o impactst1
```

Table of systematics

Take script here [↗](#)

Step 1: breakdown in different types of systematics

Step 2: plotting

To run:

```
python table_sysys.py > commands_table_sysys.sh
```

```
chmod +x commands_table_sysys.sh
```

```
./commands_table_sysys.sh
```

2D contours

a) Run central fit:

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -l) -n ttH_ttZ_central --fastScan --algo grid --points 1800 --redefineSignalPOIs r_ttH,r_ttZ --setParameterRanges r_ttH=-2,3:r_ttZ=-2,3 (--setParameters r_ttH=1,r_ttZ=1,r_ttW=1)
```

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -l) -n ttH_ttW_central --fastScan --algo grid --points 1800 --redefineSignalPOIs r_ttH,r_ttW --setParameterRanges r_ttH=-2,3:r_ttW=-2,3 (--setParameters r_ttH=1,r_ttZ=1,r_ttW=1)
```

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -l) -n ttZ_ttW_central --fastScan --algo grid --points 1800 --redefineSignalPOIs r_ttZ,r_ttW --setParameterRanges r_ttZ=-2,3:r_ttW=-2,3 (--setParameters r_ttH=1,r_ttZ=1,r_ttW=1)
```

For 1sigma and 2sigma contours take condor submission scripts here [↗](#) and here [↗](#)

b) Run 1sigma contours (68% CL):

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -l) -n ttH_ttZ_cl68 (--fastScan --cminDefaultMinimizerStrategy 0) --cl=0.68 --algo contour2d --points=10 --redefineSignalPOIs r_ttH,r_ttZ --setParameterRanges r_ttH=-2,3:r_ttZ=-2,3
```

TestTopic11111180 < Sandbox < TWiki

```
--setParameters r_ttH=1,r_ttZ=1,r_ttW=1
```

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -1) -n ttH_ttW_cl68 (--fastScan  
--cminDefaultMinimizerStrategy 0) --cl=0.68 --algo contour2d --points=10  
--redefineSignalPOIs r_ttH,r_ttW --setParameterRanges r_ttH=-2,3:r_ttW=-2,3  
--setParameters r_ttH=1,r_ttZ=1,r_ttW=1
```

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -1) -n ttZ_ttW_cl68 (--fastScan  
--cminDefaultMinimizerStrategy 0) --cl=0.68 --algo contour2d --points=10  
--redefineSignalPOIs r_ttZ,r_ttW --setParameterRanges r_ttZ=-2,3:r_ttW=-2,3  
--setParameters r_ttH=1,r_ttZ=1,r_ttW=1
```

c) Run 2sigma contours (68% CL):

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -1) -n ttH_ttZ_cl95 (--fastScan  
--cminDefaultMinimizerStrategy 0) --cl=0.95 --algo contour2d --points=10  
--redefineSignalPOIs r_ttH,r_ttZ --setParameterRanges r_ttH=-2,3:r_ttZ=-2,3  
--setParameters r_ttH=1,r_ttZ=1,r_ttW=1
```

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -1) -n ttH_ttW_cl95 (--fastScan  
--cminDefaultMinimizerStrategy 0) --cl=0.95 --algo contour2d --points=10  
--redefineSignalPOIs r_ttH,r_ttW --setParameterRanges r_ttH=-2,3:r_ttW=-2,3  
--setParameters r_ttH=1,r_ttZ=1,r_ttW=1
```

```
combine -M MultiDimFit ttHmultilep_WS.root (-t -1) -n ttZ_ttW_cl95 (--fastScan  
--cminDefaultMinimizerStrategy 0) --cl=0.95 --algo contour2d --points=10  
--redefineSignalPOIs r_ttZ,r_ttW --setParameterRanges r_ttZ=-2,3:r_ttW=-2,3  
--setParameters r_ttH=1,r_ttZ=1,r_ttW=1
```

d) Plot with script [here](#):

```
python plot2Dcontours.py --first "ttH" --second "ttZ" --label " " --plotName  
"contour_ttH_ttZ" --outputFolder "plots" --input  
"higgsCombinettH_ttZ_central.MultiDimFit.mH120.root" --input68  
"higgsCombinettH_ttZ_cl68.MultiDimFit.mH120.root" --input95  
"higgsCombinettH_ttZ_cl95.MultiDimFit.mH120.root"
```

```
python plot2Dcontours.py --first "ttH" --second "ttW" --label " " --plotName  
"contour_ttH_ttW" --outputFolder "plots" --input  
"higgsCombinettH_ttW_central.MultiDimFit.mH120.root" --input68  
"higgsCombinettH_ttW_cl68.MultiDimFit.mH120.root" --input95  
"higgsCombinettH_ttW_cl95.MultiDimFit.mH120.root"
```

```
python plot2Dcontours.py --first "ttZ" --second "ttW" --label " " --plotName  
"contour_ttZ_ttW" --outputFolder "plots" --input  
"higgsCombinettZ_ttW_central.MultiDimFit.mH120.root" --input68  
"higgsCombinettZ_ttW_cl68.MultiDimFit.mH120.root" --input95  
"higgsCombinettZ_ttW_cl95.MultiDimFit.mH120.root"
```

Prefit plots

a) Run fit diagnostics for each subcategory:

```
cd
```

```
/afs/cern.ch/user/c/cmartinp/Legacy/combine/CMSSW_10_2_13/src/CombineHarvester/fits/CA_7Apr_unbli
```

```
combine -M FitDiagnostics ttH_2lss_1tau_nomiss_2016.txt --saveShapes  
--saveWithUncertainties --skipBOnlyFit -n _ttH_2lss_1tau_nomiss_2016 --job-mode condor
```

b) Plot:

TestTopic11111180 < Sandbox < TWiki

```
cd
```

```
~/Legacy/combine/CMSSW_10_2_13/src/HiggsAnalysis/CombinedLimit/signal_extraction_tH_ttH/
```

```
python test/makePlots.py --input
```

```
/afs/cern.ch/user/c/cmartinp/Legacy/combine/CMSSW_10_2_13/src/CombineHarvester/fits/CA_7Apr_unbli
```

```
--odir
```

```
/afs/cern.ch/user/c/cmartinp/Legacy/combine/CMSSW_10_2_13/src/CombineHarvester/fits/CA_7Apr_unbli
```

```
--original
```

```
/afs/cern.ch/user/c/cmartinp/Legacy/combine/CMSSW_10_2_13/src/CombineHarvester/fits/CA_7Apr_unbli
```

```
--era 2016 --nameOut ttH_2lss_1tau_miss_2016 --channel 2lss_1tau --nameLabel " missing
```

```
jet" --do_bottom --unblind --binToRead ttH_2lss_1tau_miss --binToReadOriginal
```

```
ttH_2lss_1tau_miss
```

Postfit plots

a) Run fit diagnostics in the inclusive datacards:

```
combineTool.py -M FitDiagnostics ttHmultilep_WS_naming.root --saveShapes
```

```
--saveWithUncertainties --saveNormalization (--cminDefaultMinimizerStrategy 0)
```

```
--skipBOnlyFit -n _ttHmultilep_WS_standard --job-mode condor
```

b) Plot:

```
cd
```

```
~/Legacy/combine/CMSSW_10_2_13/src/HiggsAnalysis/CombinedLimit/signal_extraction_tH_ttH/
```

```
python test/makePlots.py --input
```

```
/afs/cern.ch/user/c/cmartinp/Legacy/combine/CMSSW_10_2_13/src/CombineHarvester/fits/CA_7Apr_unbli
```

```
--odir
```

```
/afs/cern.ch/user/c/cmartinp/Legacy/combine/CMSSW_10_2_13/src/CombineHarvester/fits/CA_7Apr_unbli
```

```
--era 2016 --nameOut ttH_2lss_1tau_miss_2016 --channel 2lss_1tau --nameLabel " missing
```

```
jet" --do_bottom --unblind --doPostFit --binToRead ttH_2lss_1tau_miss_2016 --original
```

```
/afs/cern.ch/user/c/cmartinp/Legacy/combine/CMSSW_10_2_13/src/CombineHarvester/fits/CA_7Apr_unbli
```

```
--binToReadOriginal ttH_2lss_1tau_miss
```

This topic: [Sandbox > TestTopic11111180](#)

Topic revision: r33 - 2020-05-12 - [CristinaMartinPerez](#)



Copyright &© 2008-2021 by the contributing authors. All material on this collaboration platform is the property of the contributing authors.

or Ideas, requests, problems regarding TWiki? use [Discourse](#) or [Send feedback](#)