

# Pablo Jacome's Four Top Logbook

More... Close

## References

\* <http://arxiv.org/abs/1001.0221>

\* "Four-heavy-quark hadroproduction", V. Barger, A. L. Stange, and R. J. N. Phillips, Phys. Rev. D 44 (Oct, 1991) 1987–1996, doi:10.1103/PhysRevD.44.1987.

## P) 22-Jul-2013 to 28-Jul-2013

### 1. Playing with ROOT, trying to plot PrimaryVertices histogram:

```
1. TFile* file = new TFile("FourtopsPreSelectionCycle.MC.TTTT.root", "READ");
   TTree* mytree = (TTree*)(file -> Get("AnalysisTree"));
   mytree->Draw("goodOfflinePrimaryVertices.m_nTracks");
```

```
T->StartViewer();
```

### 2. Superimposed and adding histograms:

```
1. TCanvas *c1 = new TCanvas("c1", "hists with different scales", 600, 400);

TFile* f1 = new TFile("FourtopsPreSelectionCycle.DATA.DATA.root", "READ");
TTree* t1 = (TTree*)(f1 -> Get("AnalysisTree"));
```

```
TFile* f2 = new TFile("FourtopsPreSelectionCycle.MC.TTTT.root", "READ");
TTree* t2 = (TTree*)(f2 -> Get("AnalysisTree"));
```

```
t1->Draw("goodOfflinePrimaryVertices.m_nTracks>>h1");
t2->Draw("goodOfflinePrimaryVertices.m_nTracks>>h2");
TH1F *h1 = (TH1F*)gDirectory->Get("h1");
TH1F *h2 = (TH1F*)gDirectory->Get("h2");
TH1F *h3 = (TH1F*)gDirectory->Get("h1");
h1->SetLineColor(kRed);
h3->Add(h2);
h3->Draw();
```

```
h1->Draw();
c1->Update();
h2->Draw("same");
```

## O) 15-Jul-2013 to 21-Jul-2013

### 1. QUESTIONS:

### 2. Reading about PROOF:

1. <http://indico.cern.ch/getFile.py/access?contribId=13&resId=0&materialId=slides&confId=71202>

Write-up on SFrame: <http://sourceforge.net/apps/mediawiki/sframe/> Configuring a small PROOF cluster:

[http://sourceforge.net/apps/mediawiki/sframe/index.php?title=SFrame-PROOF#Example\\_setup\\_of\\_a](http://sourceforge.net/apps/mediawiki/sframe/index.php?title=SFrame-PROOF#Example_setup_of_a)

### 2. Add the following in the config file, inside tag definition:

```
1. RunMode="PROOF" ProofServer="lite://" ProofWorkDir="__CONDOR__"
   RunMode="PROOF" ProofServer="lite" ProofWorkDir=""
```

### 3. Files for sending CONDOR jobs. **sframe\_condor\_exe.csh**:

```
1. #! /bin/csh
   #

   # Modify SFrame config
   cd ${_CONDOR_SCRATCH_DIR}
   cp -r /uscms_data/d3/pjacome/_TEST2/CMSSW_5_3_3/src/SFrame/FITAnalysis/config
   cp config/FourtopsSelectionCycleMuons_config.xml ./temp.xml
```

## LogbookFourTopAnalysisPabloJacome < Sandbox < TWiki

```
sed -i s:__CONDOR__:${_CONDOR_SCRATCH_DIR}:g temp.xml
cp temp.xml config/.
cd config

# Source version of CMSSW associated to SFRAME
source /uscmsst1/prod/sw/cms/cshrc uaf
cd /uscms_data/d3/pjacome/_TEST2/CMSSW_5_3_3/src
eval `scramv1 runtime -csh`

# Setting SFrame
cd /uscms_data/d3/pjacome/_TEST2/CMSSW_5_3_3/src/SFrame
source fullsetupSFrame.csh

# Run the sframe job
cd ${_CONDOR_SCRATCH_DIR}/config
sframe_main temp.xml
cd ${_CONDOR_SCRATCH_DIR}
rm -rf config
```

### 4. sframe\_condor\_proof\_cfg.txt

```
1. universe = vanilla
Executable = sframe_condor_exe.csh
Requirements = Memory >= 199 && OpSys == "LINUX"&& Machine == "cmswn1019.fnal.
REQUEST_CPUS = 8
+BigMemoryJob = TRUE
Output = sframe_${Cluster}_${Process}.stdout
Error = sframe_${Cluster}_${Process}.stderr
Log = sframe_${Cluster}_${Process}.log
notify_user = ${LOGNAME}@FNAL.GOV
Arguments =
Queue 1
```

### 5. Send job:

```
condor_submit sframe_condor_proof_cfg.txt
```

### 6. State of the job:

```
condor_q -bet <JOB_ID>
```

### 7. Killing 'idle' jobs that have been more than 24 hours:

```
condor_rm <JOB_ID>
```

### 8. Changing settings of condor job:

```
1. Requirements = Memory >= 199 && OpSys == "LINUX"&& (Arch != "DUMMY" )&& Disk
```

### 3. Playing with ROOT:

```
1. AnalysisTree->Scan("event")
```

### 4. Learning about Histos:

1. <http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/algomez/python/plothistos.py?view=log>
  1. python plotHistos.py -i /eos/uscms/store/user/yumiceva/fourtops/sframePresele
  2. Didn't work. It didn't throw output.root
2. <http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/Yumiceva/TreeAnalyzer/test/Analyzer.C?view=>
3. [https://twiki.cern.ch/twiki/bin/view/Main/FYumicevaTopFwk#Analysis\\_of\\_ntuples](https://twiki.cern.ch/twiki/bin/view/Main/FYumicevaTopFwk#Analysis_of_ntuples)

## N) 08-Jul-2013 to 14-Jul-2013

### 1. QUESTIONS:

1. Do I have to run the PreSelection for every type of filter? (... one for electrons, then one for muons and finally one for jets)
    1. ... muons and electrons seems to be exclusive
  2. What is BaseCycleContainer?
  3. Why Selection doesn't take input data from PreSelection?
2. Exploring `src/FourtopsPreSelectionCycle.cxx` and `src/FourtopsSelectionCycle.cxx`

1. To compare:  
/uscms/home/yumiceva/work/sframe/CMSSW\_5\_3\_3/src/SFrame/FITAnalysis/src
3. Preselection **FourtopsPreSelectionCycle.cxx** :
  1. "At least one good muon"
    1. Changed in the function: FourtopsPreSelectionCycle::BeginInputData
    2. preselection->addSelectionModule(new NElectronSelection(0,0));//no electron  
preselection->addSelectionModule(new NMuonSelection(1,int\_infinity()));
  2. "min pt, max eta , min reliso, and muon ID " for muon, electrons and jets.
    1. Changed in the function: FourtopsPreSelectionCycle::ExecuteEvent
4. Trying **Selection** code:
  1. cp /uscms/home/yumiceva/work/sframe/CMSSW\_5\_3\_3/src/SFrame/FITAnalysis/src/FourtopsS  
cp /uscms/home/yumiceva/work/sframe/CMSSW\_5\_3\_3/src/SFrame/FITAnalysis/include/Fourtop  
cp /uscms/home/yumiceva/work/sframe/CMSSW\_5\_3\_3/src/SFrame/FITAnalysis/config/Fourtop  
make
  2. No problems building. But when executing sframe\_main, It got problems loading  
libFITAnalysis
  3. SFrame/lib/libFITAnalysis.so: undefined symbol:  
\_ZN22FourtopsSelectionCycle11ShowMembersER16TMemberInspector
  4. Tried: c++filt \_ZN22FourtopsSelectionCycle11ShowMembersER16TMemberInspector
  5. Message: FourtopsSelectionCycle::ShowMembers(TMemberInspector&)
  6. nano include/FITAnalysis\_LinkDef.h  
##### ADD  
#pragma link C++ class FourtopsSelectionCycle+;  
rm src/FITAnalysis\_Dict.\*  
rm obj/\*  
rm obj/dep/\*
  7. Other issues (LumiFiles, PileUpHistos and JECFiles) where solved doing the following inside  
./FITAnalysis directory:
    1. cp /uscms/home/yumiceva/work/sframe/CMSSW\_5\_3\_3/src/SFrame/ZprimeAnalysis2012  
cp /uscms/home/yumiceva/work/sframe/CMSSW\_5\_3\_3/src/SFrame/ZprimeAnalysis2012  
cp -r /uscms/home/yumiceva/work/sframe/CMSSW\_5\_3\_3/src/SFrame/ZprimeAnalysis2

## M) 01-Jul-2013 to 07-Jul-2013

1. **QUESTIONS:**
2. **<Cycle Name=** , in config file , stores the name of the class
3. Trying to install SFrame from the sources:
  1. Following:  
[https://twiki.cern.ch/twiki/bin/viewauth/CMS/B2GZprimeSFrameInstall#Installation\\_of\\_sframe](https://twiki.cern.ch/twiki/bin/viewauth/CMS/B2GZprimeSFrameInstall#Installation_of_sframe)
    1. More... Close x{ fffd}verbatim3\x{ fffd}
4. guide USING GITHUB:
  1. More... Close

```
setenv SCRAM_ARCH slc5_amd64_gcc462
scram project CMSSW CMSSW_5_3_3
cd CMSSW_5_3_3/src
cmsenv
```

```
git clone https://github.com/UHAnalysis/NtupleWriter UHAnalysis/NtupleWriter
cvs co -d EGamma/EGammaAnalysisTools -r V00-00-31 UserCode/EGamma/EGammaAnalysisTool
scram b -j 8
```

```
svn co https://sframe.svn.sourceforge.net/svnroot/sframe/SFrame/tags/SFrame-03-06-11
cd SFrame
source setup.csh
cp ~/fullsetup_SFRAME_from_B2GZ.csh ./
source fullsetup_SFRAME_from_B2GZ.csh
sed -i 's/-lpcpre//g' core/Makefile
make
```

## LogbookFourTopAnalysisPabloJacome < Sandbox < TWiki

```
git clone https://github.com/UHHAnalysis/NtupleWriter.git NtupleWriter
git clone https://github.com/UHHAnalysis/SFrameTools.git SFrameTools
git clone https://github.com/UHHAnalysis/SFrameAnalysis.git SFrameAnalysis

cd NtupleWriter
/bin/sh ./configure.sh
make
cd ..

cp NtupleWriter/include/*.h SFrameTools/include/
cd SFrameAnalysis/include
wget --no-check-certificate https://raw.githubusercontent.com/UHHAnalysis/SFrameAnalysis/v1-00/
cd ..
cd src
wget --no-check-certificate https://raw.githubusercontent.com/UHHAnalysis/SFrameAnalysis/v1-00/
cd ../../

cd SFrameTools/include
wget --no-check-certificate https://raw.githubusercontent.com/UHHAnalysis/SFrameTools/v1-00/incl
cd ..
cd ..
cd src
wget --no-check-certificate https://raw.githubusercontent.com/UHHAnalysis/SFrameTools/v1-00/src
wget --no-check-certificate https://raw.githubusercontent.com/UHHAnalysis/SFrameTools/v1-00/src

cd ..
make
cd JetMETObjects
make
cd ../../SFrameAnalysis
make

git clone git://github.com/yumiceva/FITAnalysis.git
cd FITAnalysis
    nano src/FourtopsPreSelectionCycle.cxx
        comment: if(bcc->electrons) cleaner.ElectronCleaner(35,2.5,0.1,m
        THE PROBLEM IS BECAUSE : m_reversed_electron_selection

make
```

### 5. Messages:

#### 1. libSFrameTools.so: undefined symbol:

\_ZN17LuminosityHandler11ShowMembersER16TMemberInspector

### 6. FINAL GUIDE!! Using CMSSW

#### 1. kserver\_init

```
svn co https://sframe.svn.sourceforge.net/svnroot/sframe/SFrame/tags/SFrame-03-06-11
cd SFrame
echo "#!/bin/csh" > fullsetupSFrame.csh
echo "setenv FASTJETDIR /uscms_data/d3/pjacome/fastjet/3.0.2-install/lib" >> fullset
echo "source setup.csh" >> fullsetupSFrame.csh
echo setenv LD_LIBRARY_PATH \${FASTJETDIR}:\${SFRAME_DIR}/SFrameTools/JetMETOb
source fullsetupSFrame.csh
sed -i 's/-lpre//g' core/Makefile
make
```

```
cvs co -d SFrameAnalysis -r Feb-15-2013-v1 UserCode/UHHAnalysis/SFrameAnalysis
cvs co -d SFrameTools -r Feb-15-2013-v1 UserCode/UHHAnalysis/SFrameTools
cd SFrameTools/include
cvs co -d Objects -r Feb-15-2013-v1 UserCode/UHHAnalysis/NtupleWriter/Objects
cvs co -d HEAD UserCode/UHHAnalysis/SFrameTools/include/
cp ./HEAD/BaseHists.h ./
cd ..
make
cd JetMETObjects
make
cd ../../SFrameAnalysis
make
cd ..
```

```
git clone git://github.com/yumiceva/FITAnalysis.git
cd FITAnalysis
make
```

## L) 24-Jun-2013 to 30-Jun-2013

### 1. QUESTIONS:

1. LHE\_NtupleWriter.C in Newer versions of NtupleWriter
  2. In B2GZ they use other versions of software, ex: **git clone**  
**<https://github.com/UHHAnalysis/NtupleWriter>** [UHHAnalysis/NtupleWriter](#)
  3. What is PROOF run mode in config.xml files
  4. ERROR when executing SFrame\_main:
    1. `\x{ffff}verbatim6\x{ffff}`
  5. I think I know how to do the cuts with NtupleWriter:
    1. What is minreliso ?
    2. At least 6 jets?
  6. Don't know how to do cuts with FITAnalysis
2. Finally I solved all the problems:
1. Just copy the whole SFrame directory:
    1. `\x{ffff}verbatim7\x{ffff}`
  2. With the previous step all works ok. But I also try to change some references without success so, don't do the following:
    1. Go to SFrame directory:
      1. `\x{ffff}verbatim8\x{ffff}`
    2. Change SFrame references:
      1. `\x{ffff}verbatim9\x{ffff}`
    3. Changing FASTJET references:
      1. `\x{ffff}verbatim10\x{ffff}`
    4. Now check again for other references:
      1. `\x{ffff}verbatim11\x{ffff}`
    5. To keep PileUp information, Lumi files, etc. Copy again config files:
      1. `\x{ffff}verbatim12\x{ffff}`
3. Finish with:
1. `\x{ffff}verbatim13\x{ffff}`
4. Creating Ntuples from PATuples using Francisco's recipe:
1. Using my PATuples: I got errors:
    1. More... Close `\x{ffff}verbatim14\x{ffff}`
  2. Using PATuples from Titas Roy, it succeeded!:
    1. `\x{ffff}verbatim15\x{ffff}`
    2. Note: I just changed the source file. I didn't change any other code line.
      1. `\x{ffff}verbatim16\x{ffff}`
5. **Skimmed Analysis ntuples (Preselection)**
1. Edit: config/FourtopsPreSelectionCycleMuons\_config.xml
    1. Leave `<!ENTITY TTTT` line. Delete the other ENTITIES definitions
    2. Edit `config/53xNTuples-v2/TTTT.xml` and put the location of the Ntuple (Ntuple made using NtupleWriter)

## K) 17-Jun-2013 to 23-Jun-2013

1. Following new prescription: <https://twiki.cern.ch/twiki/bin/view/Main/FYumicevaSFrameFwk>
  1. SFrame installation:
    1. ROOT (**OK**)
    2. CMSSW 5 3 3 (**OK**)
    3. Ntuple writer (in CMSSW) (**OK**)

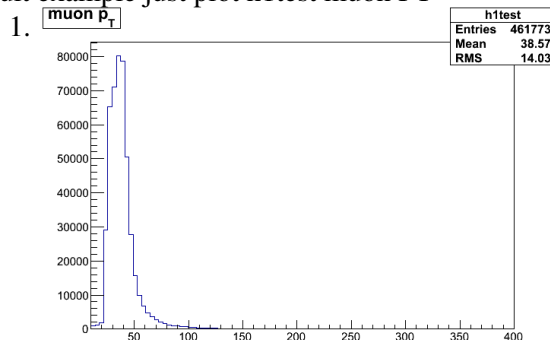
4. FastJet (**OK**) -> Next time could be installed in other directory, outside /CMSSW\_5\_3\_3/src
2.
  1. fastjet-3.0.4.tar.gz
  2. More... Close \x{fffd}verbatim17\x{fffd}
2. SFrame (**OK**)

## J) 12-Jun-2013 to 16-Jun-2013

1. Stat I - Hands-on Tutorial Session (HATS) at LPC:  
<https://indico.cern.ch/conferenceDisplay.py?confId=253180>
  1. Is it mandatory to create a parameter with a defined range?
  2. Page 7,  
<https://indico.cern.ch/getFile.py/access?sessionId=1&resId=1&materialId=0&confId=253180>
  3. Created a signal Gaussian using parameters without ranges and works perfectly.
2. Reading "Training and classification of BDT" for thesis plan.
3. Reading "Hypothesis testing" from CLASHEP Perú slides:  
<http://indico.cern.ch/getFile.py/access?contribId=20&resId=0&materialId=slides&confId=208901>
4. Analysis of Ntuples:
  1. Source: [https://twiki.cern.ch/twiki/bin/view/Main/FYumicevaTopFwk#Analysis\\_of\\_ntuples](https://twiki.cern.ch/twiki/bin/view/Main/FYumicevaTopFwk#Analysis_of_ntuples)
  2. After executing "cvs co ..." code, do (this avoids dependencies problems):
    1. cvs co -r V00-03-03 -d Yumiceva/Top7TeV UserCode/Yumiceva/Top7TeV
    2. scram b
  3. Another Error messages:
    1. 20:03:15 8637 Wrk-0.17 | Error in <TFile::TFile>: file /query-result.root do
    - 20:03:15 8637 Wrk-0.17 | Info in <TProofServLite::HandleArchive>: file canno
    - 20:03:15 8572 Wrk-0.10 | Error in <TFile::TFile>: file /query-result.root do
    - 20:03:15 8572 Wrk-0.10 | Info in <TProofServLite::HandleArchive>: file canno
4. To plot root histograms:
  1. root -l results\_data.root
    1. 

```
__file0->GetListOfKeys()->Print();
TH1F *h = (TH1F*)_file0->Get("h1test");
h->Draw();
```

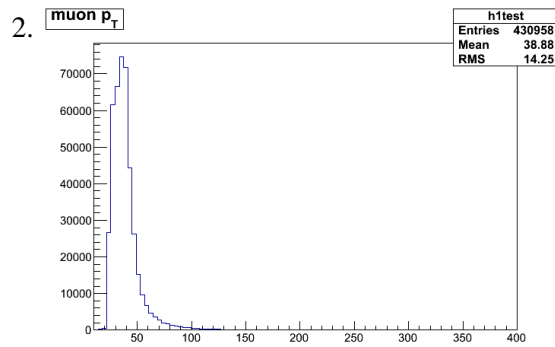
### 2. Default example just plot h1test muon PT



### 3. Plotting leading muon histogram. Change SimpleAnalyzer.C :

1. 

```
TopMuonEvent max_pt_muon;
max_pt_muon.pt = 0.;
for ( size_t imu=0; imu < total_muons; ++imu) {
    TopMuonEvent muon = muons[imu];
    if ( muon.pt > max_pt_muon.pt){
        max_pt_muon.pt = muon.pt;
    }
}
h1test->Fill( max_pt_muon.pt );
```



### I) 27-May-2013 to 02-Jun-2013

1. Due to problems in FourTop model for MadGraph (low Xsec)

1.

Source	X Sec. SM, 14TeV pp → tt-t-	X Sec. GH 700, 14TeV, pp → GH GH → tt-t-	X Sec. GH 700, 14TeV, pp → GH GH	X Sec. GH 700, 14TeV, pp → GH GH → b-b-b-	Reference
MadGraph	0.00779 pb	0.00337 pb	0.413 pb	problems	
<b>Paper:</b> Massive color-octet ..	-	-	0.4 pb	0.02 pb	<a href="http://arxiv.org/pdf/0709.2378v3.pdf">http://arxiv.org/pdf/0709.2378v3.pdf</a>
<b>Paper:</b> Top compositeness ..	0.0036 pb	-	-	-	<a href="http://arxiv.org/pdf/0712.3057v1.pdf">http://arxiv.org/pdf/0712.3057v1.pdf</a>

### H) 13-May-2013 to 19-May-2013

1. Reading about analysis script:  
[https://twiki.cern.ch/twiki/bin/view/Main/FYumicevaTopFwk#Analysis\\_of\\_ntuples](https://twiki.cern.ch/twiki/bin/view/Main/FYumicevaTopFwk#Analysis_of_ntuples)
- 2.

### G) 06-May-2013 to 12-May-2013

1. Requesting several letters (to EPN and IECE) for applying a bursary for SENESCYT
2. Making the application
3. Writing paper for EPN magazine
4. Calculating number of events of Four Tops in SM and heavy colorons
  1. pp collisions Xsec

	$\sigma_{Tot}$	$\sigma_{elastic}$	$\sigma_{Inelastic}$	Source
8 Tev	100 mb	28 mb	72 mb	<a href="http://arxiv.org/pdf/1105.4916v3.pdf">http://arxiv.org/pdf/1105.4916v3.pdf</a>
8 Tev	101.7 mb	27.1 mb	74.7 mb	<a href="http://arxiv.org/pdf/1303.2927v2.pdf">http://arxiv.org/pdf/1303.2927v2.pdf</a>
	Xsec/Model using MadGraph5		Standard Model	Heavy scalar octets mGH=700GeV
	$\overline{\sigma_{pp \rightarrow t\bar{t}t\bar{t}}}$		7.133E-4 [pb]	2.32E-4 [pb]
CMS Total			21.79 fb <sup>-1</sup> * 101.7 mb	= 2.21E15 events
SM expected			21.79 fb <sup>-1</sup> * 0.7133 fb	= 15.54 events

### J) 12-Jun-2013 to 16-Jun-2013

Heavy scalar bosons expected	$21.79 \text{ fb}^{-1} * 2.32\text{E-}4 \text{ pb}$	= 5.05 events
------------------------------	---	---------------

## F) 29-April-2013 to 05-May-2013

### 1. Questions:

- ◆ Difference between : GEN,SIM and RECO vs GEN,FASTSIM, HLT

### 2. <https://twiki.cern.ch/twiki/bin/view/Main/FranciscoYumicevaSim>

### 3. Running code for plot histograms of GEN-FASTSIM-HLT root file :

1. `cvs co UserCode/Yumiceva/Scripts`  
`python GenParticleAnalyzer.py -i Hadronizer_TuneZ2star_8TeV_generic_LHE_pythia_tauo1`

### 4. Reading: <https://twiki.cern.ch/twiki/bin/view/CMSPublic/WorkBookPATWorkflow>

1. "The Analysis Tool (AT) group of CMS strongly recommends to use `pat::Tuples` instead of flat ntuples due to the following reasons:"

### 5. Reading log output when created "tlbsm\_53x\_v2\_mc.root" (PatTuple step), found an error: More... Close

```
Begin processing the 1st record. Run 1, Event 1, LumiSection 1 at 18-Apr-2013 09:36:03.058
----- Begin Fatal Exception 18-Apr-2013 09:36:03 CDT-----
An exception of category 'ProductNotFound' occurred while
  [0] Processing run: 1 lumi: 1 event: 1
  [1] Running path 'p0'
  [2] Calling event method for module HBHENoiseFilter/'HBHENoiseFilter'
Exception Message:
  could not find HcalNoiseSummary.
  Additional Info:
    [a] If you wish to continue processing events after a ProductNotFound exception,
    add "SkipEvent = cms.untracked.vstring('ProductNotFound')" to the "options" PSet in the
----- End Fatal Exception -----
```

### 1. Find the strings:

```
# process all the events
process.maxEvents.input = 100
```

### 2. and add: **THIS JUST KEEP ITERATING OVER ALL EVENTS EVEN WHEN AN ERROR HAPPENED IN THE FIRST EVENT.**

```
1. process.options = cms.untracked.PSet(
    SkipEvent = cms.untracked.vstring('ProductNotFound')
)
```

### 3. Add CMSSW package which contains HcalNoiseSummary.cc. **BUT THIS DIDN'T FIX THE PROBLEM**

```
4. kserver_init
addpkg DataFormats/METReco
scram b
```

### 5. Removing all the lines containing: "HBHENoiseFilter", ""

```
1. ## The iso-based HBHE noise filter _____
#process.load('CommonTools.RecoAlgos.HBHENoiseFilter_cfi')
```

```
## The CSC beam halo tight filter _____
#process.load('RecoMET.METAnalyzers.CSCHaloFilter_cfi')
```

```
#####
```

```
process.filtersSeq = cms.Sequence(
  process.primaryVertexFilter *
  process.noscraping *
  # process.HBHENoiseFilter *
  # process.CSCTightHaloFilter *
  process.hcalLaserEventFilter *
  process.EcalDeadCellTriggerPrimitiveFilter *
  process.goodVertices * process.trackingFailureFilter *
  process.eeBadScFilter
```



```
)

#####

#if options.runOnFastSim:
#   process.patseq.remove( process.HBHENoiseFilter )
#   process.patseq.remove( process.CSCTightHaloFilter )
```

6. Doing PatTuple Tutorial with my GEN\_FASTSIM\_HLT.root :

1. <https://twiki.cern.ch/twiki/bin/view/CMSPublic/WorkBookPATTupleCreationExercise>
  1. PhysicsTools/PatAlgos/test/patTuple\_standard\_cfg.py
  2. edmDumpEventContent patTuple.root
2. Exploring my GEN\_FASTSIM\_HLT.root file with ROOT/TBrowser I realized that there is just xxxx\_HLT objects. ( No xxxx\_RECO objects)
3. Success creating **patTuple\_standard.root**

7. Now creating PatTuples following the tutorial:

1. <https://twiki.cern.ch/twiki/bin/view/CMSPublic/WorkBookPATExampleTopQuarks>
  1. PhysicsTools/PatExamples/test/patTuple\_topPreproduction\_cfg.py
  2. edmDumpEventContent patTuple.root

8. Doing NTuples:

1. [https://twiki.cern.ch/twiki/bin/view/CMS/ExoticaWptb#Ntuple\\_Prescription](https://twiki.cern.ch/twiki/bin/view/CMS/ExoticaWptb#Ntuple_Prescription)
2. Modifications:

```
1. $ nano Yumiceva/Top7TeV/test/TuplesFromPAT.py
1. if inputType=="MC":
    process.source = cms.Source("PoolSource",
                                fileNameNames = cms.untracked.vstring(
                                    'file:/uscms_data/d3/pjacome/exercises/ntuple_exoticaWptb/CMSST
                                ))
```

3. \$ cmsRun Yumiceva/Top7TeV/test/TuplesFromPAT.py useData=0 channel=muon events=100 >& ntuple\_100.log

4. Error message: More... Close

```
1. 02-May-2013 11:33:19 CDT Initiating request to open file file:/uscms_data/d3
02-May-2013 11:33:20 CDT Successfully opened file file:/uscms_data/d3/pjacome
02-May-2013 11:33:20 CDT Closed file file:/uscms_data/d3/pjacome/exercises/n
%MSG-s CMSEException: AfterSourceConstruction 02-May-2013 11:33:20 CDT pre-e
cms::Exception caught in cmsRun
---- FatalRootError BEGIN
Error occured while constructing primary input source.
Source is of type "PoolSource"
---- FatalRootError BEGIN
Fatal Root Error: @SUB=TStreamerInfo::Compile
Counter fNClusterRange should not be skipped from class TTree

Error occurred while creating source PoolSource
---- FatalRootError END
---- FatalRootError END
```

%MSG

◇

- Now following new recipe from Francisco Yumiceva: <https://twiki.cern.ch/twiki/bin/view/Main/FYumicevaTopFwk> **IT WORKS**

• SM PatTuples:

1. /eos/uscms/store/user/troy2012/PaTTuples\_v1/

• Questions:

1. DO I have to tuning HCAL signal response?
  1. <https://twiki.cern.ch/twiki/bin/view/CMSPublic/FastSimTuningHCALSignal>

2. Will I have to run EDAnalyzer for patTuple.root to get analyzePatMuons.root?
3. I Did PatTuples using PhysicsTools/PatAlgos/test/patTuple\_standard\_cfg.py
4. Event Selection? analyzerTopSelection\_cfg.py
5. What if I change CMSSW version of the prescription?
6. Learning how to do NTuples:
  1. [https://twiki.cern.ch/twiki/bin/view/CMS/ExoticaWptb#Ntuple\\_Prescription](https://twiki.cern.ch/twiki/bin/view/CMS/ExoticaWptb#Ntuple_Prescription)
7. Do I have to change/install pythia 8 ?
8. If I began using an especific version of CMSSW, Do I have to keep working with this for all the processes (MG, FASTSIM, PatTuples, NTuples) ?

## E) 22-April-2013 to 26-April-2013

- Stuying QFT
- Writing thesis plan.
- Reading Dobrescu and 4 top papers:
  - ◆ "Weak-triplet, color-octet scalars, and the CDF dijet excess", Dobrescu, Bogdan A. and Krnjaic, Gordan Z.
  - ◆ "Top compositeness at the Tevatron and LHC", Ben Lillie and Jing Shu and Tim M.P. Tait
  - ◆ "Massive color-octet bosons and pairs of resonances at hadron colliders", Dobrescu
  - ◆ "Heavy octets and Tevatron signals with three or four b jets"
  - ◆ "Strong Dynamics and Electroweak Symmetry Breaking", Christopher T. Hill and Elizabeth H. Simmon
- Questions:
  1. What is current state of heavy scalar bosons since the higgs discovery? ( Heavy scalar bosons try to explain electroweak symmetry breaking)
  2. Finding Dobrescu predictions for two pairs of  $t\bar{t}$ , not just heavy scalar bosons x-sec.
  3. Found 3.6 fb for  $t\bar{t}$  in SM. What's energy? It is not visible over background?
  4. Dind't find yet the value for  $t\bar{t}$  x-sec in color-octet model.
  5. Fig 4 of "Massive color-octet bosons and pairs of resonances at hadron colliders"
  6. Fig 2. in "Weak-triplet, color-octet scalars, and the CDF dijet excess", Dobrescu, Bogdan A. and Krnjaic, Gordan Z.,  
doesn't seems to be for Heavy escalar bosons because it says " charged octo-triplet"
  7. It is  $b\bar{b}$  decays greater than  $t\bar{t}$  decay for GH bosons? in "Massive color-octet bosons and pairs of resonances at hadron colliders", Dobrescu,
    1. (Section 5)
      - ...
      - If the coefficient  $c_s$  is flavor independent, GH decays predominantly into  $b\bar{b}$  or  $t\bar{t}$  for masses above 350 GeV. However, it is possible that  $c_s$  is nonzero only for down-type quarks, so that even above the  $t\bar{t}$  threshold the dominant decay is into  $b\bar{b}$
      - ...
    2. (Section 6)
      - ...
      - and a 100% branching fraction of GH to  $b\bar{b}$  (next-to-leading order corrections, which may be sizable, are not included). The production cross section is huge, more than 20 times that for a quark of equal mass, allowing for early discovery.
      - ...

## D) 18-April-2013

- PatTuple creation
  - ◆ \$ cp TopQuarkAnalysis/TopPairBSM/test/ttbsm\_cfg.py TopQuarkAnalysis/TopPairBSM/test/4topbsm\_cfg.py
  - ◆ \$ nano TopQuarkAnalysis/TopPairBSM/test/4topbsm\_cfg.py

```
◇ process.source.fileNames = [  
  #  
  '/store/mc/Summer12_DR53X/TTJets_MassiveBinDECAY_TuneZ2star_8TeV-madgraph-tau  
  'file:/eos/uscms/store/user/pjacome/FOURTOPS_GH750_1000_1/Hadronizer_TuneZ2star_8T  
  ]
```

- ◆ Edit input filename
- ◆ \$ cmsRun TopQuarkAnalysis/TopPairBSM/test/4topbsm\_cfg.py useData=0 >& output.log

## C) 17-April-2013

- Reading about Proca model
- Reading about Local gauge invariance, massless bosons, chiral symmetries, helicity, etc. (... homework for a master's subject)
- Learning how create PATtuple following:
  - ◆ [https://twiki.cern.ch/twiki/bin/viewauth/CMS/B2GTopLikeBSM53X#Version\\_2\\_53x\\_pre\\_Moriond\\_v](https://twiki.cern.ch/twiki/bin/viewauth/CMS/B2GTopLikeBSM53X#Version_2_53x_pre_Moriond_v)

## B) 16-April-2013

- Finish Chapter 2, QFT David Tong
- Testing the scripts. 1 job of 1000 events lasts 2:30 hours.

## A) 15-April-2013

Creating scripts to send several simulation jobs automatically.

- 4top\_mg5.csh , for madgraph
- 4top\_cmssw.csh , for GEN, FASTSIM and HLT

---

This topic: Sandbox > LogbookFourTopAnalysisPabloJacome  
Topic revision: r66 - 2013-09-16 - PabloJacome



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