


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# Tau HLT

Complete: 

## Goal of this page

This page provides instructions for running the tau High Level Trigger.

## Tau triggers

The following trigger paths have been implemented:

- HLT1Tau: single Tau trigger
- HLT1Tau1MET: Single Tau plus MET trigger (as the above one but with lower thresholds due to the presence of a MET selection even at L1)
- HLT2Tau: Double Tau trigger (uses pixel tracks for isolation).
- HLTXElectronTau: Electron+Tau trigger.
- HLTXMuonTau: Muon+Tau trigger (uses pixel tracks for isolation).

On how to use the trigger bits to select events in the output module, please look at: [EDM Paths SWGuide](#)

## Instructions for running the Tau HLT with CMSSW\_1\_3\_1\_HLT6

```
scramv1 project CMSSW CMSSW_1_3_1_HLT6
cd CMSSW_1_3_1_HLT6/src
eval `scramv1 runtime -csh`
project CMSSW
cvs co -r V_HLT6 HLTrigger/btau/test
cd HLTrigger/btau/test
```

Run the cfg file named `hlt_tau_1_3_1_HLT6.cfg` (see it in the [code browser](#)). All the tau triggers will be run. The output is written in the `test.root` file in the local area.

For samples with two tau leptons in the final states (as  $Z \rightarrow \tau\tau$  and  $qqH \rightarrow \tau\tau$ ) the `TauJetMCFilter` module can be used to select only desired tau decays and apply MC fiducial cuts:

```
module tauHadrFilter = TauJetMCFilter{
  InputTag GenParticles = VtxSmearred
  double EtTau = 0.0
  double EtaTauMin = 0.0
  double EtaTauMax = 2.5
  double EtaElecMax=2.5
  double EtaMuonMax=2.5
  double PtElec =0.
  double PtMuon=0.
  vstring includeList ={"tautau"}
#   vstring includeList ={"etau"}
#   vstring includeList ={"mutau"}
}
```

## Instructions for running the Tau HLT with CMSSW\_1\_6\_0

```
scramv1 project CMSSW CMSSW_1_6_0
cd CMSSW_1_6_0/src
eval `scramv1 runtime -csh`
project CMSSW
cvs co -r V00-00-02 RecoTauTag/HLTAnalyzers
cvs co -r V_1_6_0 HLTrigger/btau/test
scramv1 b
cd HLTrigger/btau/test
```

Run the cfg file named `hlt_tau.cfg` (see it in the code browser<sup>?</sup>). All the tau triggers will be run. The output is written in the `test.root` file in the local area.

For samples with two tau leptons in the final states (as  $Z \rightarrow \text{tautau}$  and  $qqH \rightarrow \text{tautau}$ ) the `TauJetMCFilter` module can be used to select only desired tau decays and apply MC fiducial cuts:

```
module tauHadrFilter = TauJetMCFilter{
  InputTag GenParticles = source
    double EtTau = 0.0
    double EtaTauMin = 0.0
    double EtaTauMax = 2.5
    double EtaElecMax=2.5
    double EtaMuonMax=2.5
    double PtElec =0.
    double PtMuon=0.
    vstring includeList ={"tautau"}
#   vstring includeList ={"etau"}
#   vstring includeList ={"mutau"}
}
```

Both cases 1 and 2 in `HLTSetup` (under `HLTrigger/Configuration/data/common`) are currently working, corresponding to running off a normal digi file or a raw (+L1) file.

**ATTENTION:** the default is case 2 in `HLTSetup` - running off Raw files as will be standard procedure. Thus you need to provide a file containing Raw (e.g., look at the catalog DBS2) or create a Raw file yourself (using `RelVal_Digi_DigiToRaw.cfg`), and then run `HLTtable.cfg` or `RelVal_HLTFromRaw.cfg` off that file. Alternatively, edit `HLTrigger/Configuration/data/common/HLTSetup.cff` to switch to case 1 and run off a digi file, but this works only for a 152 (or higher) data/digi file. If the digi file is older, then run `RelVal_Digi_DigiToRaw.cfg` first to make a Raw file, and run the HLT in its default setting (case 2) from that Raw file. In any case, 13x or older files can't be used as they can't be read by 16x.

## Instructions for analysing the Tau HLT with CMSSW\_1\_6\_0

In order to analyze HLT output, the following code is a good skeleton to start with:

```
scramv1 project CMSSW CMSSW_1_6_0
cd CMSSW_1_6_0/src
eval `scramv1 runtime -csh`
project CMSSW
cvs co -r v00-01-05 RecoTauTag/HLTAnalyzers
scramv1 b -j 4 BUILDVERBOSE=''
cd RecoTauTag/HLTAnalyzers/test
cmsRun RunHLTTauAnalyzer.cfg
```

Tau-trigger paths and different collections as well as monte-carlo tau decays can be tuned from the `RunHLTTauAnalyzer.cfg` file. `RecoTauTag/HLTAnalyzers/HLTTauAnalyzer.cc` is extensively commented

for trigger/CMSSW beginners

## Review Status

Reviewer/Editor and Date (copy from screen)	Comments
SimoneGennai - 02 Apr 2007	last content editor
JennyWilliams - 10 Apr 2007	non-twiki word tidying

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