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Offline L1 DQM Workflow L1TvsReco

Introduction

The L1 DQM workflow L1TvsReco performs the comparison of the L1 trigger data with reconstructed objects, including efficiency calculation. The modules from the workflow run on Tier-0 in the prompt reconstruction workflow, in re-reconstruction workflow, in release validation and MC production workflows.

DQM Module description

module

Object selection

L1Extra objects

All the L1Extra objects are used, no selection is applied on objects.

Reconstructed objects

Muons

Reco muons as in L1Ntuple

<http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/L1TriggerDPG/src/L1MuonRecoTreeProducer.cc?view=log>
, e.g.:

```
edm::Handle<reco::MuonCollection> mucand;  
iEvent.getByLabel("muons", mucand);
```

Cuts on muon objects taken from "Tight Muons" definition (see MuonID from the Muon POG):

- Muon of type Global (evaluate to ask Global && Tracker)
- At least two muon stations associated to the standalone part of the muon
- At least 1 valid muon hit in the muon system
- At least 10 valid hits in the silicon tracker
- At least 1 valid hit in the pixels
- A χ^2/ndof for the global track less than 10

Matching to L1Extra can be done, with increasing level of precision:

- using the reco muon phi coordinate. This coordinate is at vertex thus a large matching cone is required. Matching inefficiency can show up at low Pt.
- using the reco muon coordinates obtained propagating the muon trajectory to the second muon station. This is the L1 Muon reference cylinder/plane and a more precised matching is allowed.
- using second muon station with exceptions in the CSC region where depending on the track mode different planes can be reference. See code in L1MuonRecoTreeProducer to see how this is done.

Jets

Reco Jets as in L1Ntuple

<http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/L1TriggerDPG/src/L1AnalysisRecoJet.cc?revision=1.4&view=>
.

*Jet corrections are:

```
jetCorrectorServiceName = cms.untracked.string("ak5CaloL1L2L3")
```

Cuts on Jet objects :

- Jet with $pt > 10$ GeV.
- Passing Loose ID defined as:
 - ◆ $EMF > 0.01$.
 - ◆ $n90hits > 1$.
 - ◆ $fHPD < 0.98$.

Matching to L1Extra

- Reco Jets are matched to L1Extra Jets using a delta R cut of 0.5.
- The 'Matched' Jet is defined as the Jet with the minimum delta R

Review status

Reviewer/Editor and Date	Comments
VasileGhete - 06-Oct-2011	First version

Responsible: VasileGhete, PasqualeMusella, LuigiGuiducci

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