MiniAOD Details

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Details

- Small event size (30-50 kb/event).

The main contents of the MiniAOD are:

- High level physics objects (leptons, photons, jets, ETmiss), with detailed information
    - Allow retuning of identification criteria, saved using PAT dataformats.
    - Some preselection requirements (failing implies not stored or stored only with limited information.
    - Some high level corrections are applied: L1+L2+L3(+residual) corrections to jets, type1 corrections to Etmiss.
- The full list of particles reconstructed by the ParticleFlow
    - Only storing the most basic quantities for each object (4-vector, impact parameter, pdg id, some quality flags)
    - Reduced numerical precision; these are useful to recompute isolation, or to perform jet substructure studies.
    - For charged particles with pT> 0.9 GeV, more information about the associated track is saved, including the covariance matrix, so that they can be used for b-tagging purposes.
- MC Truth information: a subset of the genParticles
    - Enough to describe the hard scattering process,
    - Jet flavour information, and final state leptons and photons;
    - GenJets with pT > 8 GeV also stored
    - Other mc summary information (e.g event weight, LHE header, PDF, PU information).
    - All the stable genParticles with mc status code 1 are also saved (allows reclustering of GenJets with different algorithms and substructure studies)
- Trigger information:
    - trigger bits associated to all paths
    - All the trigger objects that have contributed to firing at least one filter within the trigger.
    - all objects reconstructed at L1 and the L1 global trigger summary, prescale values of all the triggers.

Our usage case

- MiniAOD has a very similar implementation to our current framework ntuples
    - PAT based stripped informations
    - Filtered collections (Minimum pT cuts, etc)
- At first look nothing we need is missing
    - Generator information present (including gen jets)
    - Trigger information present (all necessary things L1 and HLT present)
    - Reco quantities also there with enough information to repeat most ID calculations
    - Even all tracks via charged particles (associated track) so track based variables are possible :)
- After yeasterday having a chat with Seth (from H->gamma gamma)
    - They have code in place to access this (he pointed me to it)
    - They have already implemented some new primary vertex calculation with usage of photons (can we do same with HF jets?)
    - We should be able to re-use code and know how for of FW
- No show stoppers up to now except:
    - Current MiniAOD is for CMSSW_7_0_X
    - Trigger studies are at CMSSW_7_2_0 (not likelly to be backported)
    - Not obvious if MiniAOD will work out of the box on CMSSW_7_2_X

Trigger work

- Currently working on replicating L1T behavior
  - Simulating prescales in order to calculate total L1T rate
  - Calculate pure and additional rates
- Currently observing disagreaments
  - Some numbers do not agree with TSG (I also do not thrust them)
  - Some numbers do not agree with my own studies (maybe bugs or CMSSW versions)
  - Mor e to come in the next few days
- More studies to follow on new assymetric triggers
  - Full L1T + HLT optimization studies
  - Generator level studies (Jim is working on that)
  - Reco level studies (need more code and ntuples in place)
- New HLT paths in the way to be included in MC production
  - Based on ETM70
  - Base Path: HLT_DiPFJet40_Deta3p5_MJJ600_PFMETNoMu140_v1
    - Rate: 4.7 Hz Additional efficiency to PFMET170: 10%
  - Systematics Path: HLT_DiPFJet40_Deta3p5_MJJ600_PFMETNoMu80_v1
    - Rate 0.1 Hz prescale 5000 (L1T: 1000 and HLT: 5)