AlCa_HcalPhiSym & AlCa_IsoTrack HLT performance

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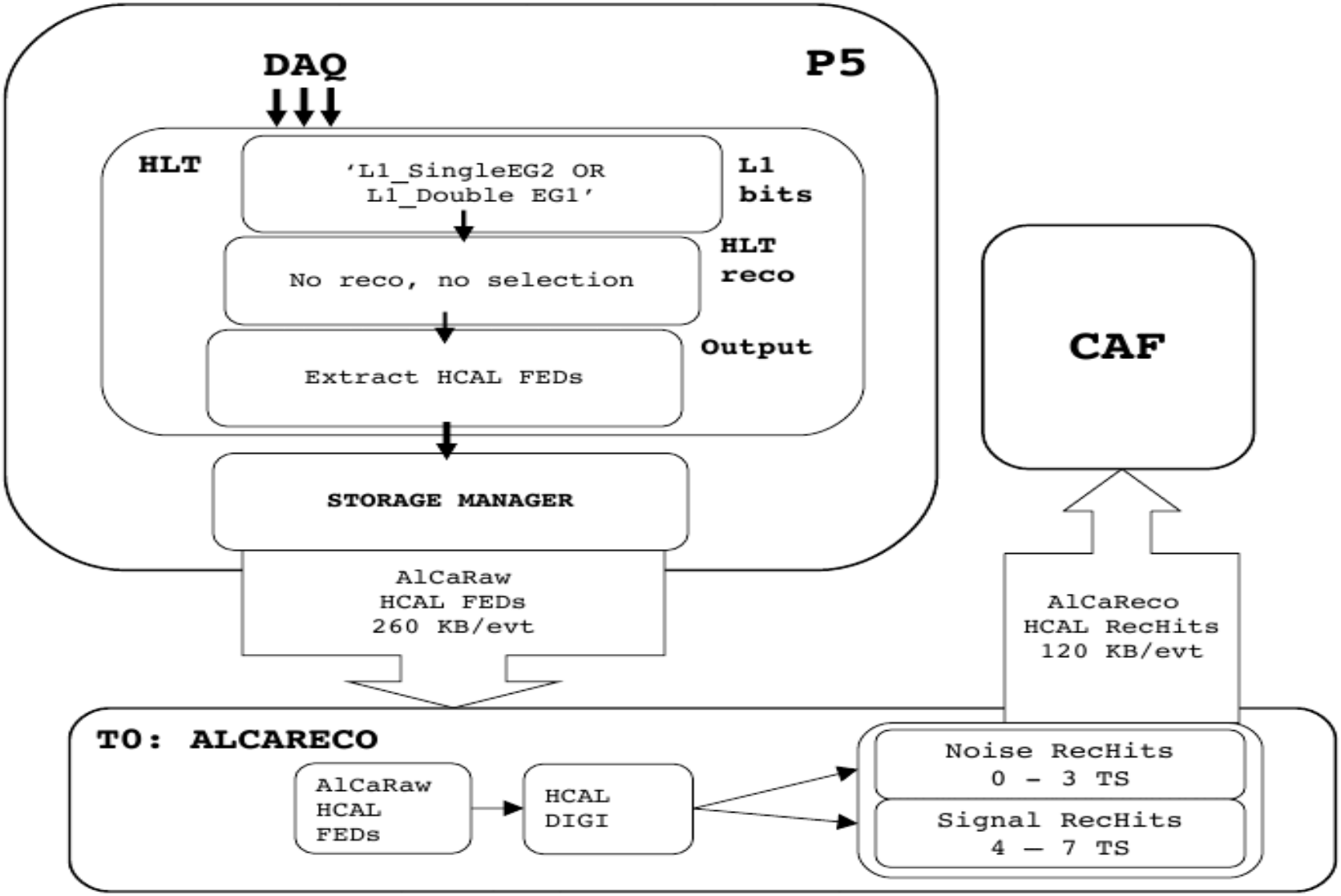
HcalPhiSym workflow



AlCa_HcaPhiSym Performance

- The path is to be used only in HACL HZSP runs
- No reconstruction is done at HLT, only L1 seeding
- The event content is only HCAL FEDs
- The total event size is ~260KB
- Each MB/s of bandwidth allocated gives ~4Hz of rate

AlCa_IsoTrack

HLT logic

- L1 seeds:

'L1_SingleJet30 OR L1_SingleJet50 OR
L1_SingleJet70 OR L1_SingleJet100 OR
L1_SingleTauJet30 OR L1_SingleTauJet40 OR
L1_SingleTauJet60 OR L1_SingleTauJet80'

	Current	Proposed
L2 reco	do pixel reco	do pixel reco
L2 selection		dXY to vertex < 0.05; pixel track pT > 3.5 GeV; isolation pT** < 0.9 GeV; pixel track $\|\eta\|$< 2.0
L3 reco		do on demand tracking seeded by L2 candidates: seeding cone 0.05
L3 selection	dR to L1 tau jet < 0.5; pixel track pT > 20Gev; isolation pT** < 2GeV	require single track with p>14 GeV in unpacked cone

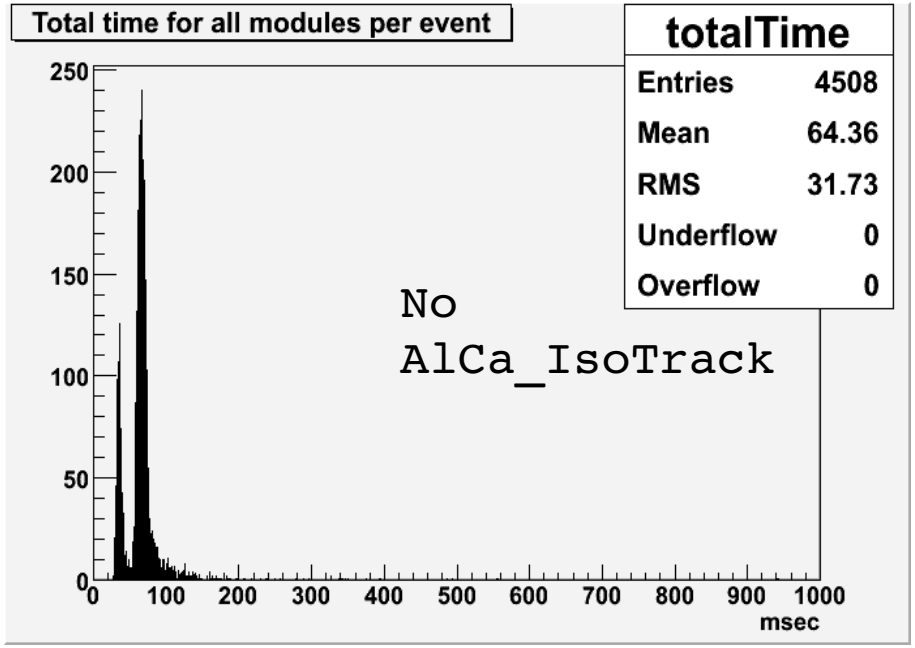
HLT performance

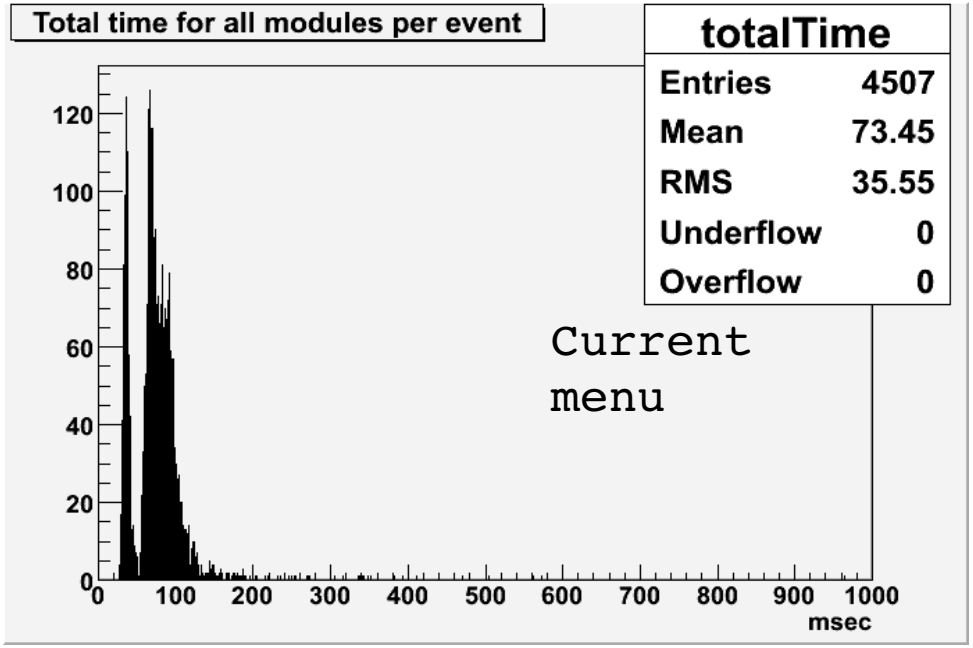
Rates

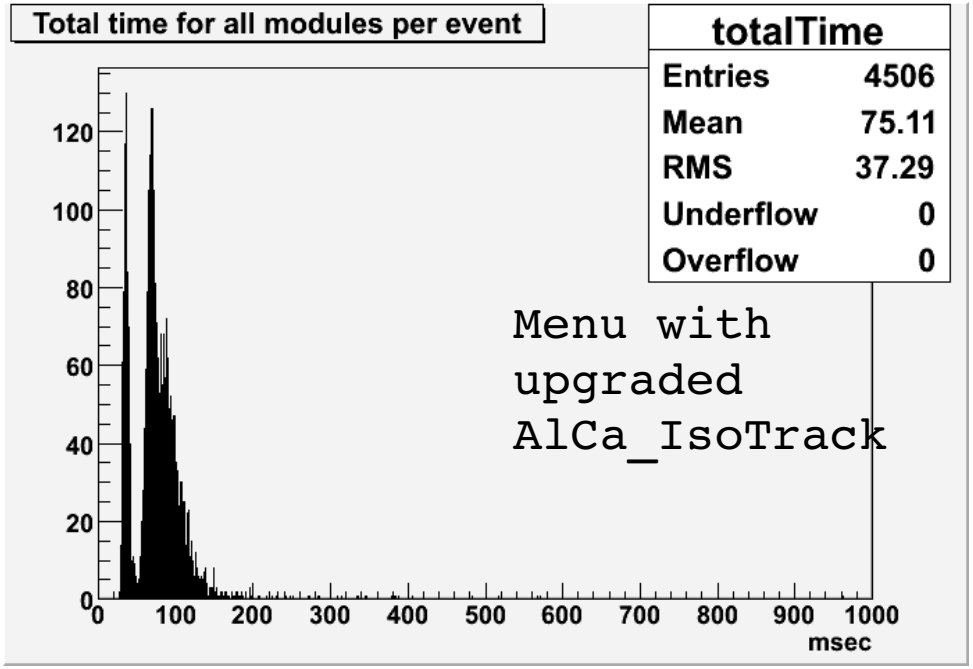
- Rates were evaluated for 8e29 and 2.9e30 luminosity L1 tables, in CMSSW_2_1_7 using CMSSW_2_1_2 STARTUP_V5 RAW
- Total L1 rate means total rate from AlCa_IsoTrack L1 seeds

STARTUP_V5				
Sample	L1 rate** (Hz)	New HLT rate (Hz)	Old HLT rate (Hz)	Luminosity
MinBias	2415	15±1	27±1	2.90E+030
PpEleX	18.7	0.101±0.006	---	
PpMuX	11.6	0.04±0.03	---	
MinBias	680	4.2±0.3	7.6±0.3	8.00E+029

Timing for 8e29 menus

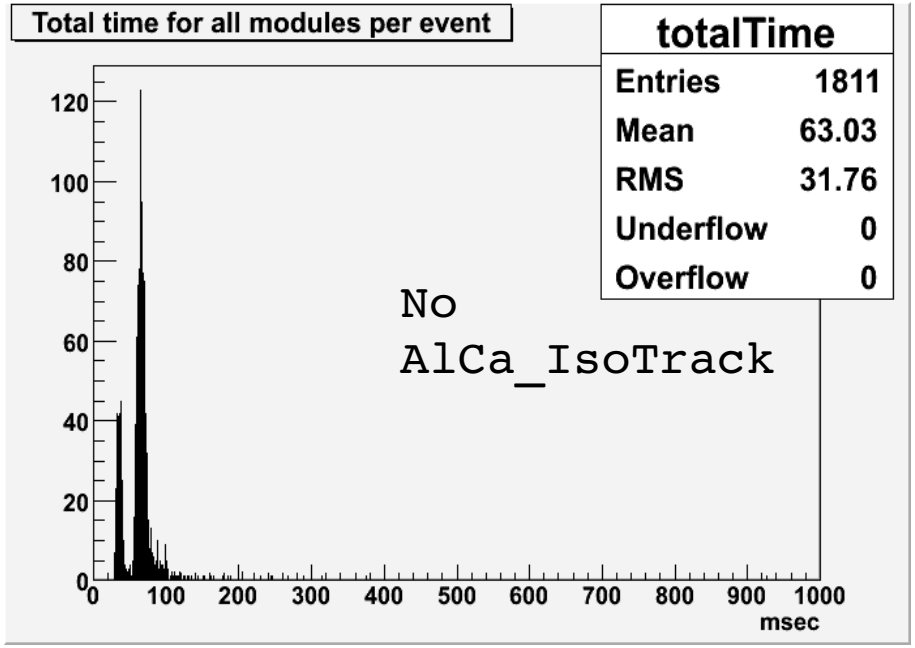


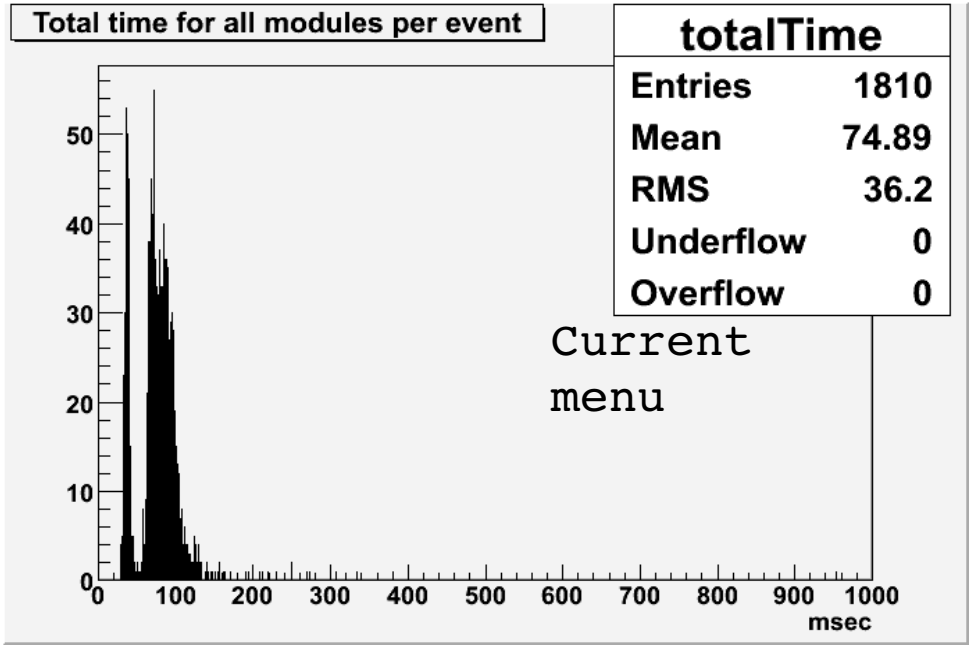




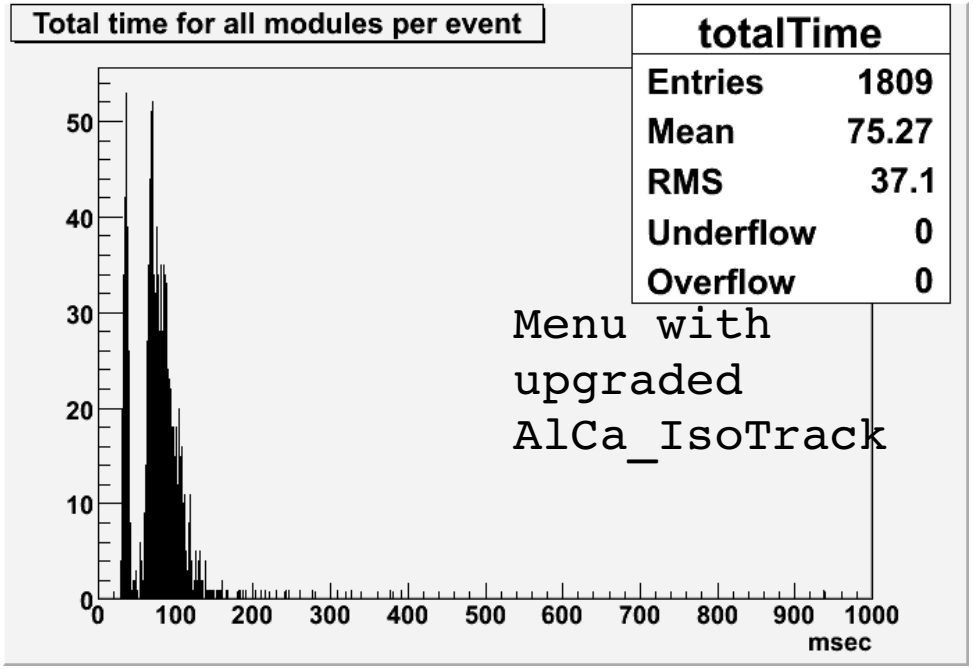
- Timing test was run on lxbuild067 on L1-skimmed STARTUP_V5 minBias sample
- Difference of upgraded vs current timing ~1.66ms

Timing for 2.9e30 menus

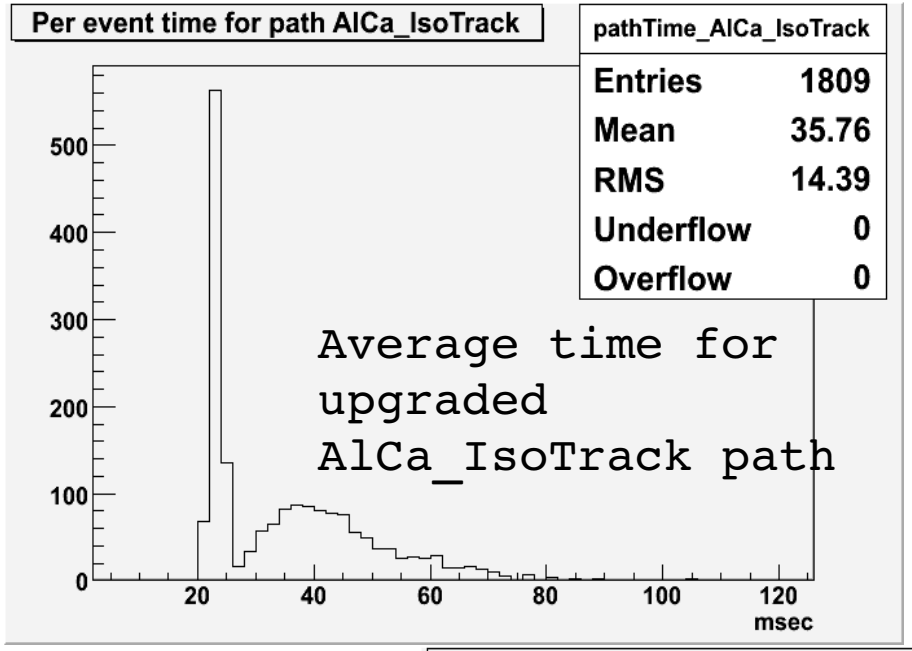


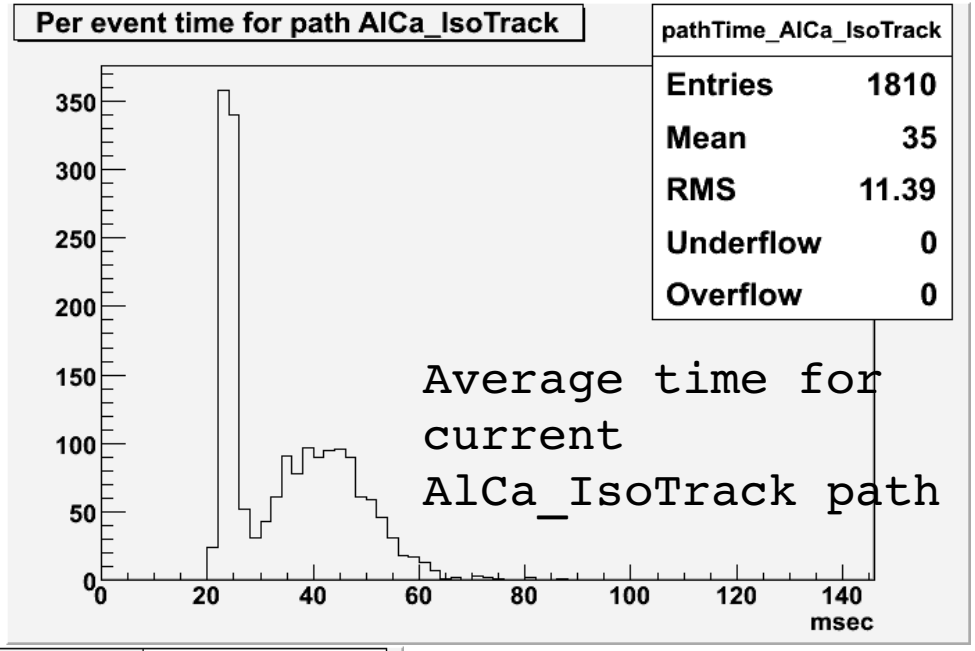


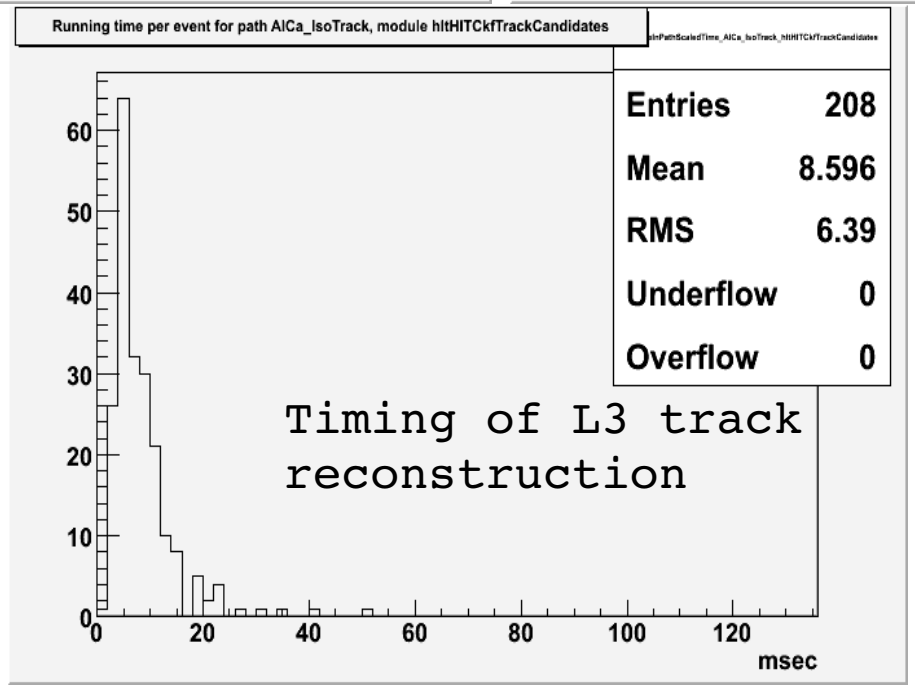
- Timing test was run on lxbuild067 on L1-skimmed STARTUP_V5 minBias sample
- Difference of current configuration vs upgraded is ~0.38ms



Standalone timing







Event size

- Event size was tested on CMSSW_2_1_2 STARTUP_V5 sample with L1 and HLT 2.9e30 menus
- Keep statements for regular HLT event content:

```
'drop *',
'keep FEDRawDatCollection_rawDataCollector_*_*',
'keep edmTriggerResults_*_*_*',
'keep triggerTriggerEvent_*_*_*',
'keep *_hltL1ExtraParticles_*_*',
'keep *_hltL1GtObjectMap_*_*'
```

- Total HLT event size was found to be ~164KB/evt
- AlCa_IsoTrack keep statements:

```
'drop *',
'keep edmTriggerResults_*_*_*',
'keep triggerTriggerEvent_*_*_*',
'keep l1extraL1JetParticles_hltL1extraParticles_*_*',
'keep *_hltIsolPixelTrackProd_*_*',
'keep *_hltPixelTracks_*_*',
'keep *_hltHITCtfWithMaterialTracks_*_*',
'keep *_hltHITIPTCorrector_*_*',
'keep *_hltSubdetFED_*_*',
'keep *_hltEcalRegFED_*_*',
'keep *_hltSiStripRegFED_*_*'
```

- IsoTrack AlCaRaw event size was found to be ~85KB

Summary (concerning IsoTrack)

- AlCa_IsoTrack AlCaRaw event size reduction is ~2
- Absolute AlCa_IsoTrack event size is ~85KB
- Rate of new AlCa_IsoTrack for 8e29 menus is 4.2Hz (~360 KB/s), for 2.9e30 menus (~1.28 MB/s)
- New configuration adds ~ 1.66ms to 8e29 menu and ~0.38ms to 2.9e30 menu

Thanks to Tulika, Bryan, Zeynep, Stephanie for help