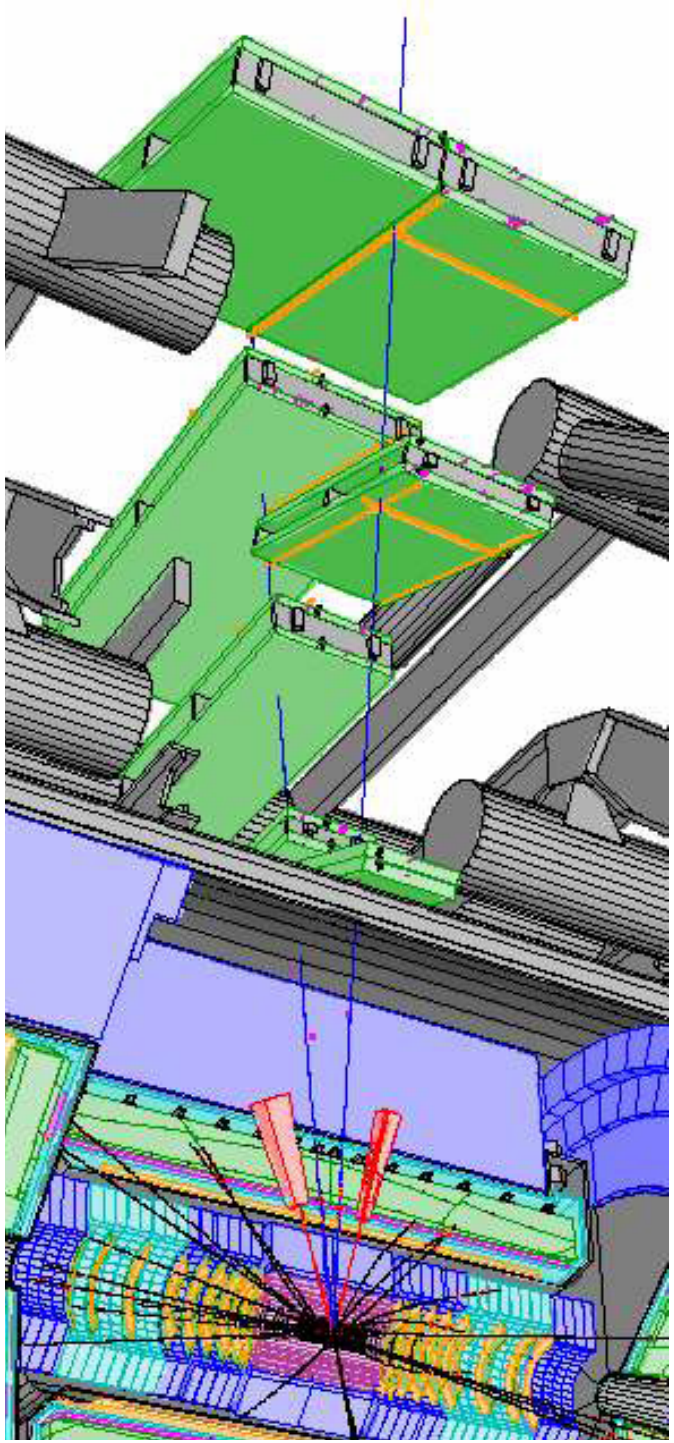

Trigger Validation

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on behalf of trigger community
Physics Validation Meeting – Feb. 13, 2007

Outline:

- New tags in 12.0.5.2
- To come in 12.0.5.3
- Remaining problems

12.0.5.2

Issues from last meeting/12.0.5.1

- e15i: doesn't exist in menu L2_e15iL2_e15i/ EF_e15iEF_e15i is the right signature to search for in TriggerDecision
- L2_e10L2e10: not a separate signature; this is created to feed into L2_Ze10e10; should not be satisfied in TriggerDecision
- L2_Z(e10e10): now called L2_Ze10e10 (more info later)
  - this is not clear at the moment, we may have to live without it
- EF_MuonTRTExt_mu6l: this should be EF_mu6l, which is ok
- Trigger rate on min. bias higher at EF than L2: this was a problem with the plot
- L1_FJ30: just fixed (~20mins ago)… see later in the talk

12.0.5.2

- Fixed Savannah bugs:
  - 23272: now possible to distinguish electron and photon containers in ESD/AOD; see Valeria's talk in last meeting: http://indico.cern.ch/conferenceDisplay.py?confId=11374
  - 23399: L2_Z(e10e10) signature name changed to L2_Ze10e10 plus branch/leaf names in CBNT_TriggerDecision to avoid problems with ROOT::MakeClass()
  - 23374: segfault in e/γ CBNT makers caused by ID tracks being removed from ESD (to reduce size)
  - 23477: TrigVertexFitter fix for rare (1/10,000) failed assertion in B-physics code

12.0.5.2 (cont)

Other issues:

- Please remember to always use CSC-06 or CSC-06-900GeV with 12.0.5.2!
  - **Problems reported this morning when using wrong configuration**

- Feature: efficiency of muon signatures:
  - Care must be taken when interpreting the L1 muon signatures: L1 sends to L2 only the highest threshold passed
    - If L1_MU06 and L1_MU20 passed then only L1_MU20 is passed to L2
    - If L1_MU06 and L1_MU08 passed, L1_MU06L1_MU06 fails!

- New tag to fix forward jet signature L1_FJ30 not seen in TriggerDecision:
  - Ongoing work: new problem identified last night
  - New TrigT1Calo tag fixed L1_FR10 (i.e. right) but L1_FL10 (left) still not working: can't get left+right L1_FJ30
  - There is now a fix for this…

Trigger configuration in 12.0.5.2

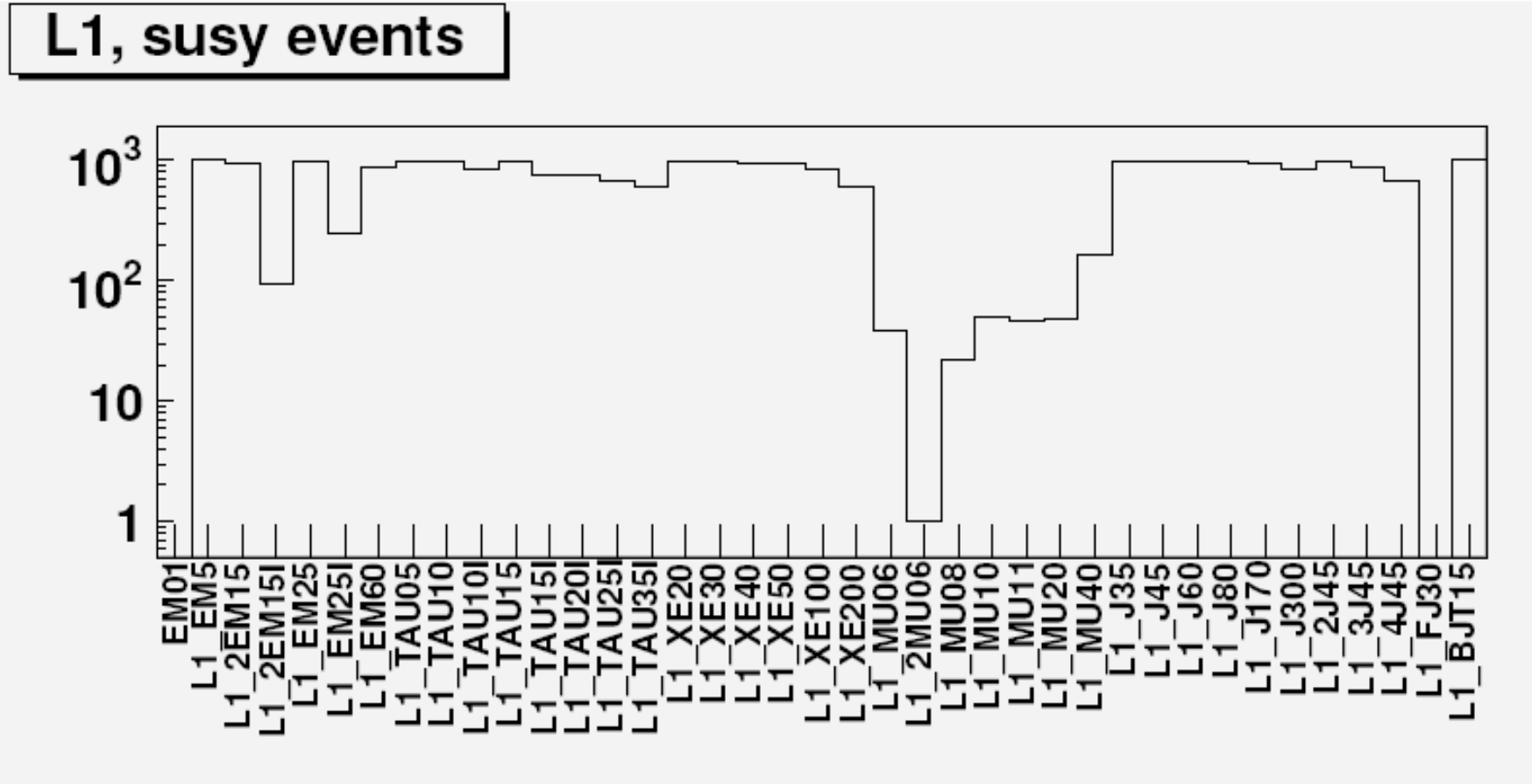
- Two trigger configurations available:
  https://twiki.cern.ch/twiki/bin/view/Atlas/TriggerMenuVersions

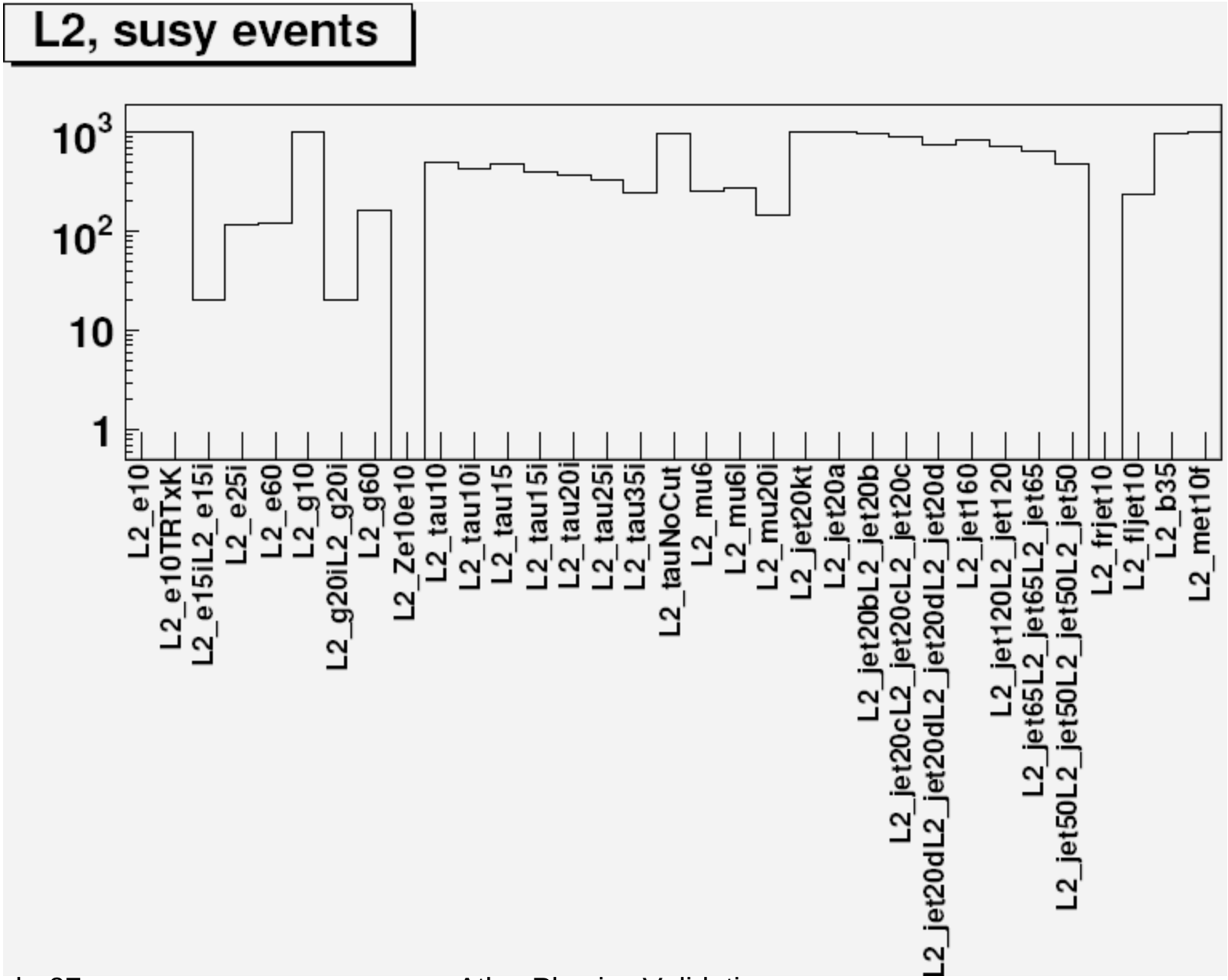
- General MC production: TriggerConfig "CSC-06"
- B-physics MC production: TriggerConfig "CSC-06-900GeV"

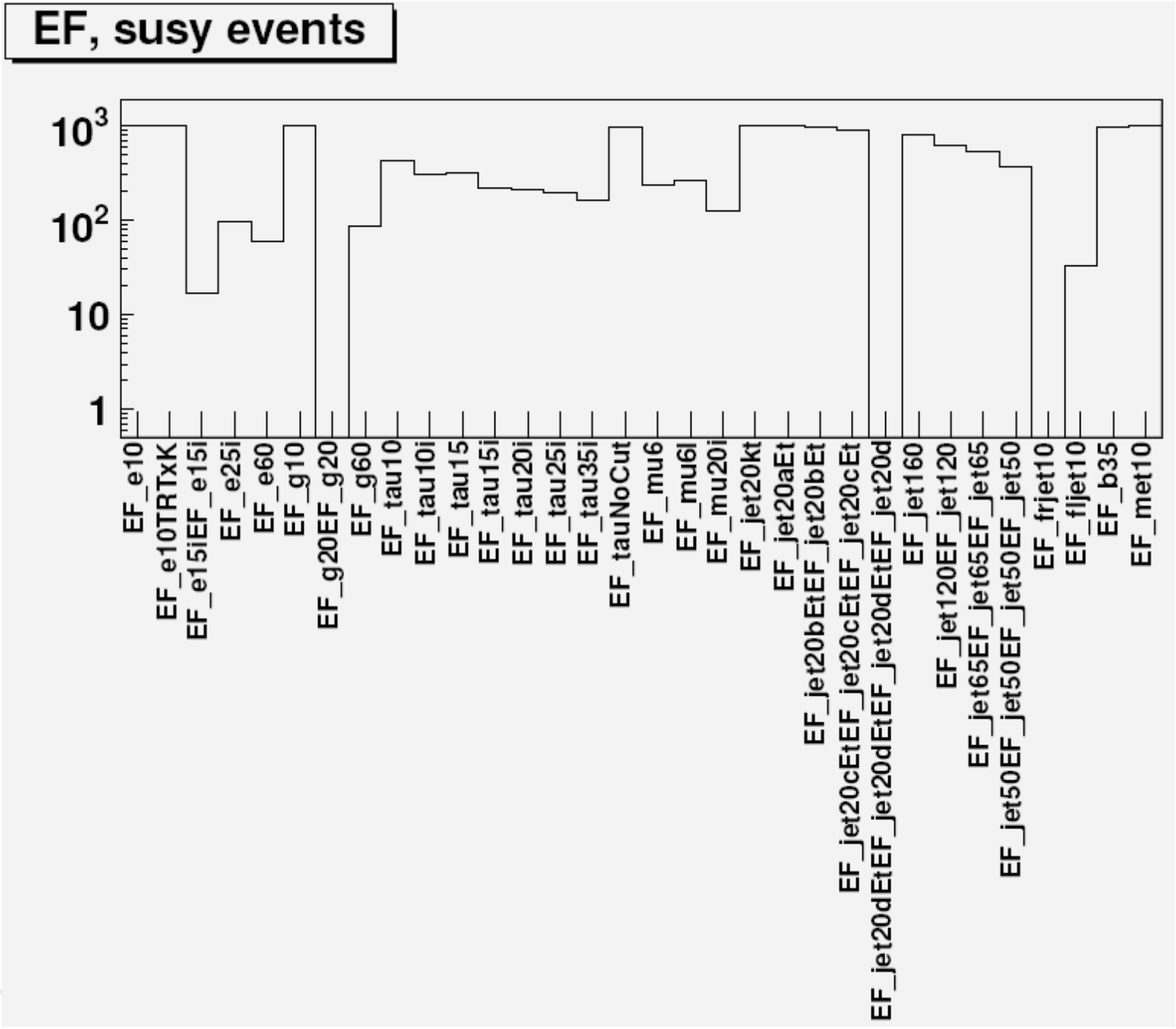
- Only differences wrt "CSC-05":
  - New Level jet 1 thresholds added:
    - L1_J60 (35GeV), L1_J80 (55GeV), L1_J170 (80GeV), L1_J300 (150GeV)
  - HLT:
    - L2_Z(e10e10) changed to L2_Ze10e10
    - Photon signatures now have Event Filter algorithms
    - HLT e15i chains now start from Level 1 EM11I (isolation) instead of EM11

- "STR-01" configuration added for streaming tests

At a glance…


L1, susy events
10^3
10^2
10
1
EM01
L1_EM5
L1_2EM15
L1_2EM15I
L1_EM25
L1_EM25I
L1_EM60
L1_TAU05
L1_TAU10
L1_TAU10I
L1_TAU15
L1_TAU15I
L1_TAU20I
L1_TAU25I
L1_TAU35I
L1_XE20
L1_XE30
L1_XE40
L1_XE50
L1_XE100
L1_XE200
L1_MU06
L1_2MU06
L1_MU08
L1_MU10
L1_MU11
L1_MU20
L1_MU40
L1_J35
L1_J45
L1_J60
L1_J80
L1_J170
L1_J300
L1_2J45
L1_3J45
L1_4J45
L1_FJ30
L1_BJT15


L2, susy events
10^3
10^2
10
1
L2_e10
L2_e10TRTxK
L2_e15iL2_e15i
L2_e25i
L2_e60
L2_g10
L2_g20iL2_g20i
L2_g60
L2_Ze10e10
L2_tau10
L2_tau10i
L2_tau15
L2_tau15i
L2_tau20i
L2_tau25i
L2_tau35i
L2_tauNoCut
L2_mu6
L2_mu6l
L2_mu20i
L2_jet20kt
L2_jet20a
L2_jet20bL2_jet20b
L2_jet20cL2_jet20cL2_jet20c
L2_jet20dL2_jet20dL2_jet20dL2_jet20d
L2_jet160
L2_jet120L2_jet120
L2_jet65L2_jet65L2_jet65
L2_jet50L2_jet50L2_jet50L2_jet50
L2_frjet10
L2_fljet10
L2_b35
L2_met10f


EF, susy events
10^3
10^2
10
1
EF_e10
EF_e10TRTxK
EF_e15iEF_e15i
EF_e25i
EF_e60
EF_g10
EF_g20EF_g20
EF_g60
EF_tau10
EF_tau10i
EF_tau15
EF_tau15i
EF_tau20i
EF_tau25i
EF_tau35i
EF_tauNoCut
EF_mu6
EF_mu6l
EF_mu20i
EF_jet20kt
EF_jet20aEt
EF_jet20bEtEF_jet20bEt
EF_jet20cEtEF_jet20cEtEF_jet20cEt
EF_jet20dEtEF_jet20dEtEF_jet20dEtEF_jet20d
EF_jet160
EF_jet120EF_jet120
EF_jet65EF_jet65EF_jet65
EF_jet50EF_jet50EF_jet50EF_jet50
EF_frjet10
EF_fljet10
EF_b35
EF_met10

e/gamma Validation (Valeria)

- TriggerConfig **CSC-06** was used in **12.0.5.2** productions
- First look at reconstucted AODs. Produced CBNT from AOD's for the following datasets: **trig1_misal1_mc12.005802.JF17_pythia_jet_filter (6.5k)**
  trig1_misal1_csc11.005310.PythiaH120gamgam (4 K)
  trig1_misal1_csc11.005200.T1_McAtNlo_Jimmy (2.5K)
  - All results compartible with 12.0.5.1
  - Trigger Efficiencies and rates were calculated from TriggerDecision
  - TriggerDecision filled correctly for all electrons and photons signatures

dijets J17

	e25i	2g20i	2e15i	e60	g60
L1	7.9 kHz	558 Hz	558 Hz	1.4 kHz	1.4 kHz

*Cross section * filter efficiency = 0.191 mb*

H →γγ (120 GeV)

Level	2g20i	g60
L1	88.0%	87.0%
L2	71.0%	72.0%
EF	62.0%	68.0%

Top events (2500 ev)

Level	e25i	2e15i
L1	975	250
L2	675	50
EF	575	**

12.0.5.3

For 12.0.5.3

- Fixed: AOD→SAN step required changes in CBNTAA_TriggerDecision (fixes due to Ketevi and Monika, thanks!)

- The following are not (yet?) lined up for 12.0.5.3:
  - A fix for the L1_FJ30 signature exists
  - A fix for exists to change level 2 TRTxK ϕ range from old convention $[0,2\pi]$ to $[-\pi,\pi]$ (Savannah bug 23701)

Remaining problems/features

These will be corrected in rel.13, and many new features added

Minor bugs:

- Some trigger algorithms/objects still follow wrong ϕ-range convention
  - No known problems: values corrected locally where used, but should be fixed to avoid future bugs

- TriggerDecision:
  - TriggerDecision::signatures() – returns 3 times L1 menu instead of all signatures
  - TriggerDecision::ignore_TriggerItems() – works only for 1st signature in the list (if it is an “invisible” signature)
  - Workarounds in: https://twiki.cern.ch/twiki/bin/view/Atlas/TriggerDecision#12_0_5

- Other:
  - L2_Ze10e10: not sure about this one ongoing work

A couple of comments from people doing validation:

1. Access to data is not reliable:
   - When data is being replicated to different sites it becomes temporarily unavailable on original site
   - This usually happens on mondays before the validation meeting ☺ when support response is slow due to many other dq2 requests
   - Maybe these samples should have higher priority

2. It would be a great help if patched releases would be installed in AFS
   1. Many people end up wasting time to set up the patched release by getting all the extra tags
   2. Alternatively getting the cache should be straightforward and well documented

Summary

- 12.0.5.2 validated in several slices
- A few problems found that will be fixed in 12.0.5.3
- Remaining problems are in principle small and hopefully we can live with them (e.g. minor TriggerDecision bugs, workarounds exist)
- The bug fixes mentioned here benefited much from user/validators feedback (thanks!)

Backup

CSC-06 menu

- Level 1 here; HLT next two pages
- CSC-06-900GeV not shown
- Note that these are NOT optimised: some efficiencies and rates are NOT realistic
- The level of realism varies: better ask…
- Some are not physics signatures (e10, tauNoCut, etc)
- That's why we need physics data with trigger information

Name	Threshold (GeV)
EM01	7
L1_EM5	3
L1_2EM15	11
L1_2EM15I	11 + isolation
L1_EM25	18
L1_EM25I	18 + isolation
L1_EM60	50
L1_TAU05	5
L1_TAU10	8
L1_TAU10I	8 + isolation
L1_TAU15	13
L1_TAU15I	13 + isolation
L1_TAU20I	17 + isolation
L1_TAU25I	22 + isolation
L1_TAU35I	30 + isolation
L1_XE20	20
L1_XE30	30
L1_XE40	40
L1_XE50	50
L1_XE100	100
L1_XE200	200

Name	Threshold (GeV)
L1_MU06	6
L1_2MU06	6
L1_MU08	8
L1_MU10	10
L1_MU11	11
L1_MU20	20
L1_MU40	40
L1_J35	15
L1_J45	20
L1_J60	35
L1_J80	55
L1_J170	80
L1_J300	150
L1_2J45	20
L1_3J45	20
L1_4J45	20
L1_FJ30	10
L1_BJT15	4

From: https://twiki.cern.ch/twiki/bin/genpdf/Atlas/TriggerMenuVersions

trigger item name	L2 name in decision	EF name in decision	started with Level–1 item
e10	L2_e10	EF_e10	EM01
e10TRTxK	L2_e10TRTxK	EF_e10TRTxK	EM01
2e15i	L2_e15iL2_e15i	EF_e25iEF_e25i	L1_2EM15
e25i	L2_e25i	EF_e25i	L1_EM25
e60	L2_e60	EF_e60	L1_EM60
g10	L2_g10	EF_g10	EM01
2g20i	L2_g20iL2_g20i	EF_g20EF_g20	L1_2EM15I
g60	L2_g60	EF_g60	L1_EM60
Zee	L2_Ze10e10	n/a	n/a
tau10	L2_tau10	EF_Tau10	L1_Tau10
tau10i	L2_tau10i	EF_Tau10i	L1_Tau10I
tau 15	L2_tau15	EF_tau15	L1_Tau15
tau15i	L2_tau15i	EF_tau15i	L1_Tau15i
tau20i	L2_tau20i	EF_tau20i	L1_Tau20i
tau25i	L2_tau25i	EF_tau25i	L1_Tau25i
tau35i	L2_tau35i	EF_tau35i	L1_Tau35i
tauNoCut	L2_tauNoCut	EF_tauNoCut	L1_TAU05

trigger item name	L2 name in decision	EF name in decision	started with Level–1 item
mu6	L2_mu6	EF_mu6	L1_MU06
mu6l	L2_mu6l	EF_mu6l	L1_MU06
mu20	L2_mu20i (sic)	EF_mu20i (sic)	L1_MU20
jet20kt	L2_jet20kt	EF_jet20kt	L1_J35
jet20a	L2_jet20a	EF_jet20aEt	L1_J35
jet20b	L2_jet20bL2_jet20b	EF_jet20bEtEF_jet20bEt	L1_J35
jet20c	L2_jet20cL2_jet20cL2_jet20c	EF_jet20cEtEF_jet20cEtEF_jet20cEt	L1_J35
jet20d	L2_jet20dL2_jet20dL2_jet20dL2_jet20d	EF_jet20dEtEF_jet20dEtEF_jet20dEtEF_jet20d	L1_J35
jet160	L2_jet160	EF_jet160	L1_J45
2jet120	L2_jet120L2_jet120	EF_jet120EF_jet120	L1_2J45
3jet65	L2_jet65L2_jet65L2_jet65	EF_jet65EF_jet65EF_jet65	L1_3J45
4jet50	L2_jet50L2_jet50L2_jet50L2_jet50	EF_jet50EF_jet50EF_jet50EF_jet50	L1_4J45
frjet10	L2_frjet10	EF_frjet10	L1_FJ30
fljet10	L2_fljet10	EF_fljet10	L1_FJ30
bjet35	L2_b35	EF_b35	L1_J35
met10	L2_met10	EF_met10f (sic)	L1_TAU05

Trigger tags in 12.0.5.2 wrt 12.0.5.1

- TriggerRelease-00-04-35-26 Trigger/TriggerRelease

Hypothesis algorithms for different slices
- TrigEgammaHypo-00-05-70-15 Trigger/TrigHypothesis/TrigEgammaHypo
- TrigJetHypo-00-01-26-02 Trigger/TrigHypothesis/TrigJetHypo
- TrigMissingETHypo-00-00-08 Trigger/TrigHypothesis/TrigMissingETHypo

Feature Extraction algorithms
- TrigT1Calo-01-22-10-02 Trigger/TrigT1/TrigT1Calo
- TrigVertexFitter-00-00-15 Trigger/TrigTools/TrigVertexFitter

User interface
- TrigDecisionMaker-00-01-07 Trigger/TrigAnalysis/TrigDecisionMaker
- TrigNtEgamma-01-00-07 Trigger/TrigAnalysis/TrigNtEgamma