

Preparations for Robustness Workshop

ID misalignment

Beam-related backgrounds

Trigger Robustness Workshop (04 March 2008) - Windows Internet Explorer

http://indico.cern.ch/conferenceDisplay.py?confId=29007

Trigger Robustness Workshop (04 March 2008)

login

Trigger Robustness Workshop

04 March 2008 CERN

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support

- Trigger Robustness Workshop organised by Andrew Brandt
 - 4th March – 9:00 to 18:00 @ CERN (40-S2-D01)
 - Agenda: <http://indico.cern.ch/conferenceDisplay.py?confId=29007>
 - Trigger Robustness Wiki: <https://twiki.cern.ch/twiki/bin/view/Atlas/TriggerRobustness>
- The aim of the workshop is to compile a list of problems which may affect the trigger and to set up plans to address them
- Would be good to have preliminary results on:
 - Robustness against data corruption/errors
 - ID misalignment
 - Hot/dead cells in LAr/Tile
 - Beam-related backgrounds (beam-gas, beam-halo)
 - Other types of results welcome (e.g. muon alignment/calibration, contact Andrew)

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Start TAPM-Open18Sep07 Trigger Robustne... Machine_Backgroun... robustness_align.ppt 13:36

ID misalignment

- Misaligned samples generated with **DetDescrVersion-01-00-00**
 - Corresponds roughly to a 5mm shift of the whole ID (need to check this...)
 - Too big for normal running: laser alignment can do better than this
 - But needs to be investigated: beam position shift from run to run
- ID Si alignment is corrected back to nominal in the normal misaligned RDO samples by **DetDescrVersion-01-02-00**
 - Brings back perfect alignment: not realistic, especially for initial data
- More realistic misalignment using FDR alignment constants obtained after 1 iteration
- Three levels of ID alignment:
 - level 1: each **ID subsystem** displacement wrt nominal
 - level 2: each **layer/disk** displacement wrt nominal
 - level 3: each **modules** displacement wrt nominal
 - <https://twiki.cern.ch/twiki/bin/view/Atlas/SiliconMisaCSC>
- FDR alignment constants correspond to level 2 alignment of the ID

What to do...

- Each slice is being requested to run their **efficiency measurements** with misaligned ID and compare with aligned data
 - Should be especially relevant for: B physics, B jets, taus, e/gamma, (perhaps) muons
- Recipe: run on “misal_*” RDOs with the lines:

```
IOVDbSvc = Service("IOVDbSvc")  
IOVDbSvc.GlobalTag="OFLCOND-FDR-01-01-00"  
DetDescrVersion = "ATLAS-CSC-01-00-00"
```
- This can be run at CERN: possible problems running on the grid (right version of the conditions database not necessary available)

rdo_align_moni.log

rdo_misal_moni.log

```

455 cepted by chain EF_e15_passEF loose raw: 24 PS: 24 accepted after PS and PT:
456 cepted by chain EF_3e15_passEF raw: 0 PS: 0 accepted after PS and PT: 0
457 cepted by chain EF_2e20 raw: 2 PS: 2 accepted after PS and PT: 2
458 cepted by chain EF_tau15 raw: 0 PS: 0 accepted after PS and PT: 0
459 cepted by chain EF_e20_tight raw: 19 PS: 19 accepted after PS and PT: 19
460 cepted by chain EF_e15_passL2 raw: 25 PS: 25 accepted after PS and PT: 25
461 cepted by chain EF_2j42_xe30 raw: 40 PS: 40 accepted after PS and PT: 40
462 cepted by chain EF_tau20i_j70 WO raw: 0 PS: 0 accepted after PS and PT: 0
463 ! cepted by chain EF_3b18_4L1J18 raw: 10 PS: 10 accepted after PS and PT: 10
464 cepted by chain EF_trk10i_calib raw: 25 PS: 25 accepted after PS and PT: 25
465 ! cepted by chain EF_2mu6_e10 raw: 1 PS: 1 accepted after PS and PT: 1
466 cepted by chain EF_g25i raw: 16 PS: 16 accepted after PS and PT: 16
467 cepted by chain EF_te360 raw: 0 PS: 0 accepted after PS and PT: 0
468 cepted by chain EF_e20i_passL2 raw: 22 PS: 22 accepted after PS and PT: 22
469 cepted by chain EF_e10_xe30 raw: 15 PS: 15 accepted after PS and PT: 15
470 cepted by chain EF_e25i_passL2 raw: 18 PS: 18 accepted after PS and PT: 18
471 ! cepted by chain EF_2tau25i_PT raw: 6 PS: 6 accepted after PS and PT: 6
472 cepted by chain EF_2e12_L33 raw: 0 PS: 0 accepted after PS and PT: 0
473 cepted by chain EF_e20i_passEF raw: 19 PS: 19 accepted after PS and PT: 21
474 cepted by chain EF_tau15i raw: 0 PS: 0 accepted after PS and PT: 0
475 ! cepted by chain EF_tau25i_e15i raw: 6 PS: 6 accepted after PS and PT: 6
476 ! cepted by chain EF_tau60 raw: 19 PS: 19 accepted after PS and PT: 19
477 cepted by chain EF_2FJ35 raw: 0 PS: 0 accepted after PS and PT: 0
478 cepted by chain EF_e15_loose raw: 24 PS: 24 accepted after PS and PT: 24
479 cepted by chain EF_2b42_3L1J42_passHLT raw: 0 PS: 0 accepted after PS and PT
480 cepted by chain EF_tau15i_tau45 raw: 2 PS: 2 accepted after PS and PT: 2
481 cepted by chain EF_e25_tight raw: 16 PS: 16 accepted after PS and PT: 16
482 cepted by chain EF_3mu6 raw: 0 PS: 0 accepted after PS and PT: 0
483 ! cepted by chain EF_mu20i raw: 14 PS: 14 accepted after PS and PT: 14
484 ! cepted by chain EF_3b23_3L1J23 raw: 5 PS: 5 accepted after PS and PT: 5
485 cepted by chain EF_e10_tight raw: 24 PS: 24 accepted after PS and PT: 24
486 cepted by chain EF_FJ35 raw: 0 PS: 0 accepted after PS and PT: 0
487 cepted by chain EF_tau10i_tau45 raw: 2 PS: 2 accepted after PS and PT: 2
488 ! cepted by chain EF_2b35_3L1J35 raw: 19 PS: 19 accepted after PS and PT: 19
489 cepted by chain EF_e25i raw: 16 PS: 16 accepted after PS and PT: 16
490 cepted by chain EF_4j23 raw: 0 PS: 0 accepted after PS and PT: 0
491 cepted by chain EF_xe30 raw: 0 PS: 0 accepted after PS and PT: 0
492 ! cepted by chain EF_2e10 raw: 1 PS: 1 accepted after PS and PT: 1
493 cepted by chain EF_Jpsiee raw: 0 PS: 0 accepted after PS and PT: 0
494 ! cepted by chain EF_4j23_mu15 raw: 11 PS: 11 accepted after PS and PT: 11
495 ! cepted by chain EF_em20_xe15_PT raw: 18 PS: 18 accepted after PS and PT: 18
496 cepted by chain EF_tau15i_tau35i raw: 2 PS: 2 accepted after PS and PT: 2
497 cepted by chain EF_tau10i raw: 0 PS: 0 accepted after PS and PT: 0
498 cepted by chain EF_2e15i_passL2 raw: 1 PS: 1 accepted after PS and PT: 1
499 ! cepted by chain EF_tau25i_b35 raw: 31 PS: 31 accepted after PS and PT: 31
500 cepted by chain EF_e20_tight_passL2 raw: 23 PS: 23 accepted after PS and PT:
501 cepted by chain EF_g20_xe15 raw: 18 PS: 18 accepted after PS and PT: 18
502 cepted by chain EF_e20_g20 raw: 2 PS: 2 accepted after PS and PT: 2
503 cepted by chain EF_te150 raw: 0 PS: 0 accepted after PS and PT: 0
504 cepted by chain EF_e25 raw: 17 PS: 17 accepted after PS and PT: 17
505 cepted by chain EF_e20 raw: 20 PS: 20 accepted after PS and PT: 20
506 cepted by chain EF_Zee raw: 0 PS: 0 accepted after PS and PT: 0
507 cepted by chain EF_J70 raw: 13 PS: 13 accepted after PS and PT: 13
508 cepted by chain EF_J120 raw: 21 PS: 21 accepted after PS and PT: 21
509 ! cepted by chain EF_e55_L33 raw: 10 PS: 10 accepted after PS and PT: 10
510 cepted by chain EF_2g10 raw: 1 PS: 1 accepted after PS and PT: 1
511 cepted by chain EF_g25i_L32 raw: 15 PS: 15 accepted after PS and PT: 15
512 cepted by chain EF_tau35i_xe30 raw: 0 PS: 0 accepted after PS and PT: 0
513 cepted by chain EF_g15 raw: 22 PS: 22 accepted after PS and PT: 22
514 cepted by chain EF_e5_e7 raw: 1 PS: 1 accepted after PS and PT: 1
515 ! cepted by chain EF_2mu4 raw: 7 PS: 7 accepted after PS and PT: 7
516 ! cepted by chain EF_2b42_3L1J35 raw: 14 PS: 14 accepted after PS and PT: 14
517 ! cepted by chain EF_2mu6 raw: 4 PS: 4 accepted after PS and PT: 4

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455 cepted by chain EF_e15_passEF loose raw: 24 PS: 24 accepted after PS and PT:
456 cepted by chain EF_3e15_passEF raw: 0 PS: 0 accepted after PS and PT: 0
457 cepted by chain EF_2e20 raw: 2 PS: 2 accepted after PS and PT: 2
458 cepted by chain EF_tau15 raw: 0 PS: 0 accepted after PS and PT: 0
459 cepted by chain EF_e20_tight raw: 19 PS: 19 accepted after PS and PT: 19
460 cepted by chain EF_e15_passL2 raw: 25 PS: 25 accepted after PS and PT: 25
461 cepted by chain EF_2j42_xe30 raw: 40 PS: 40 accepted after PS and PT: 40
462 cepted by chain EF_tau20i_j70 WO raw: 0 PS: 0 accepted after PS and PT: 0
463 ! cepted by chain EF_3b18_4L1J18 raw: 12 PS: 12 accepted after PS and PT: 12
464 cepted by chain EF_trk10i_calib raw: 25 PS: 25 accepted after PS and PT: 25
465 ! cepted by chain EF_2mu6_e10 raw: 0 PS: 0 accepted after PS and PT: 0
466 cepted by chain EF_g25i raw: 16 PS: 16 accepted after PS and PT: 16
467 cepted by chain EF_te360 raw: 0 PS: 0 accepted after PS and PT: 0
468 cepted by chain EF_e20i_passL2 raw: 22 PS: 22 accepted after PS and PT: 22
469 cepted by chain EF_e10_xe30 raw: 15 PS: 15 accepted after PS and PT: 15
470 cepted by chain EF_e25i_passL2 raw: 18 PS: 18 accepted after PS and PT: 18
471 ! cepted by chain EF_2tau25i_PT raw: 7 PS: 7 accepted after PS and PT: 10
472 cepted by chain EF_2e12_L33 raw: 0 PS: 0 accepted after PS and PT: 0
473 cepted by chain EF_e20i_passEF raw: 19 PS: 19 accepted after PS and PT: 21
474 cepted by chain EF_tau15i raw: 0 PS: 0 accepted after PS and PT: 0
475 ! cepted by chain EF_tau25i_e15i raw: 7 PS: 7 accepted after PS and PT: 7
476 ! cepted by chain EF_tau60 raw: 21 PS: 21 accepted after PS and PT: 21
477 cepted by chain EF_2FJ35 raw: 0 PS: 0 accepted after PS and PT: 0
478 cepted by chain EF_e15_loose raw: 24 PS: 24 accepted after PS and PT: 24
479 cepted by chain EF_2b42_3L1J42_passHLT raw: 0 PS: 0 accepted after PS and PT
480 cepted by chain EF_tau15i_tau45 raw: 2 PS: 2 accepted after PS and PT: 2
481 cepted by chain EF_e25_tight raw: 16 PS: 16 accepted after PS and PT: 16
482 cepted by chain EF_3mu6 raw: 0 PS: 0 accepted after PS and PT: 0
483 ! cepted by chain EF_mu20i raw: 13 PS: 13 accepted after PS and PT: 13
484 ! cepted by chain EF_3b23_3L1J23 raw: 9 PS: 9 accepted after PS and PT: 9
485 cepted by chain EF_e10_tight raw: 24 PS: 24 accepted after PS and PT: 24
486 cepted by chain EF_FJ35 raw: 0 PS: 0 accepted after PS and PT: 0
487 cepted by chain EF_tau10i_tau45 raw: 2 PS: 2 accepted after PS and PT: 2
488 ! cepted by chain EF_2b35_3L1J35 raw: 21 PS: 21 accepted after PS and PT: 21
489 cepted by chain EF_e25i raw: 16 PS: 16 accepted after PS and PT: 16
490 cepted by chain EF_4j23 raw: 0 PS: 0 accepted after PS and PT: 0
491 cepted by chain EF_xe30 raw: 0 PS: 0 accepted after PS and PT: 0
492 ! cepted by chain EF_2e10 raw: 3 PS: 3 accepted after PS and PT: 3
493 cepted by chain EF_Jpsiee raw: 0 PS: 0 accepted after PS and PT: 0
494 ! cepted by chain EF_4j23_mu15 raw: 10 PS: 10 accepted after PS and PT: 10
495 ! cepted by chain EF_em20_xe15_PT raw: 20 PS: 20 accepted after PS and PT: 20
496 cepted by chain EF_tau15i_tau35i raw: 2 PS: 2 accepted after PS and PT: 2
497 cepted by chain EF_tau10i raw: 0 PS: 0 accepted after PS and PT: 0
498 cepted by chain EF_2e15i_passL2 raw: 1 PS: 1 accepted after PS and PT: 1
499 ! cepted by chain EF_tau25i_b35 raw: 35 PS: 35 accepted after PS and PT: 35
500 cepted by chain EF_e20_tight_passL2 raw: 23 PS: 23 accepted after PS and PT:
501 cepted by chain EF_g20_xe15 raw: 18 PS: 18 accepted after PS and PT: 18
502 cepted by chain EF_e20_g20 raw: 2 PS: 2 accepted after PS and PT: 2
503 cepted by chain EF_te150 raw: 0 PS: 0 accepted after PS and PT: 0
504 cepted by chain EF_e25 raw: 17 PS: 17 accepted after PS and PT: 17
505 cepted by chain EF_e20 raw: 20 PS: 20 accepted after PS and PT: 20
506 cepted by chain EF_Zee raw: 0 PS: 0 accepted after PS and PT: 0
507 cepted by chain EF_J70 raw: 13 PS: 13 accepted after PS and PT: 13
508 cepted by chain EF_J120 raw: 21 PS: 21 accepted after PS and PT: 21
509 ! cepted by chain EF_e55_L33 raw: 8 PS: 8 accepted after PS and PT: 8
510 cepted by chain EF_2g10 raw: 1 PS: 1 accepted after PS and PT: 1
511 cepted by chain EF_g25i_L32 raw: 15 PS: 15 accepted after PS and PT: 15
512 cepted by chain EF_tau35i_xe30 raw: 0 PS: 0 accepted after PS and PT: 0
513 cepted by chain EF_g15 raw: 22 PS: 22 accepted after PS and PT: 22
514 cepted by chain EF_e5_e7 raw: 1 PS: 1 accepted after PS and PT: 1
515 ! cepted by chain EF_2mu4 raw: 5 PS: 5 accepted after PS and PT: 5
516 ! cepted by chain EF_2b42_3L1J35 raw: 18 PS: 18 accepted after PS and PT: 18
517 ! cepted by chain EF_2mu6 raw: 3 PS: 3 accepted after PS and PT: 3

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Beam-related background

- Are beam-gas and beam-halo events going to affect the trigger rates/purity?
- May affect especially forward muons and missing ET
- Lots of uncertainties on modelling of these backgrounds

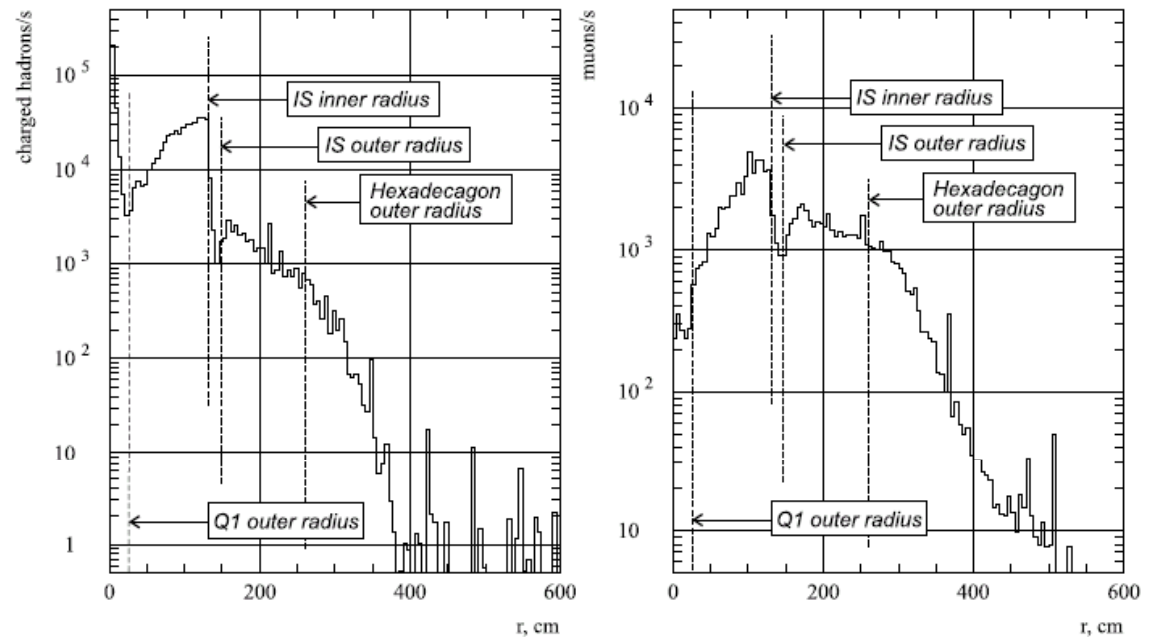


Figure 1: Radial distributions of charged hadron (left) and muon (right) flux at the UX15 entrance. Vertical lines on the plots show the limits of the material of the different elements — Q1 magnet, fixed tube of the inner shielding and hexadecagon of the outer one.

- Only available samples seem to be private ones from Alden Stradling
 - Many thanks to Alden for these samples; they are now becoming very popular! His thesis is nearing completion and expected with lots of interest.
- Looking at 10 beam-halo events overlaid with minimum bias events only!

```
events accepted by chain L2_g3_L33  raw: 1  PS: 1  accepted after PS and PT: 1
events accepted by chain L2_J5      raw: 2  PS: 2  accepted after PS and PT: 5
events accepted by chain L2_tauNoCut raw: 1  PS: 1  accepted after PS and PT: 1
events accepted by chain L2_te150   raw: 5  PS: 5  accepted after PS and PT: 5
events accepted by chain EF_e10TRTxK raw: 0  PS: 0  accepted after PS and PT: 0
events accepted by chain EF_tauNoCut raw: 1  PS: 1  accepted after PS and PT: 1
events accepted by chain EF_te150   raw: 2  PS: 2  accepted after PS and PT: 2
```