Preparations for Robustness Workshop

ID misalignment

Beam-related backgrounds

- 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)

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

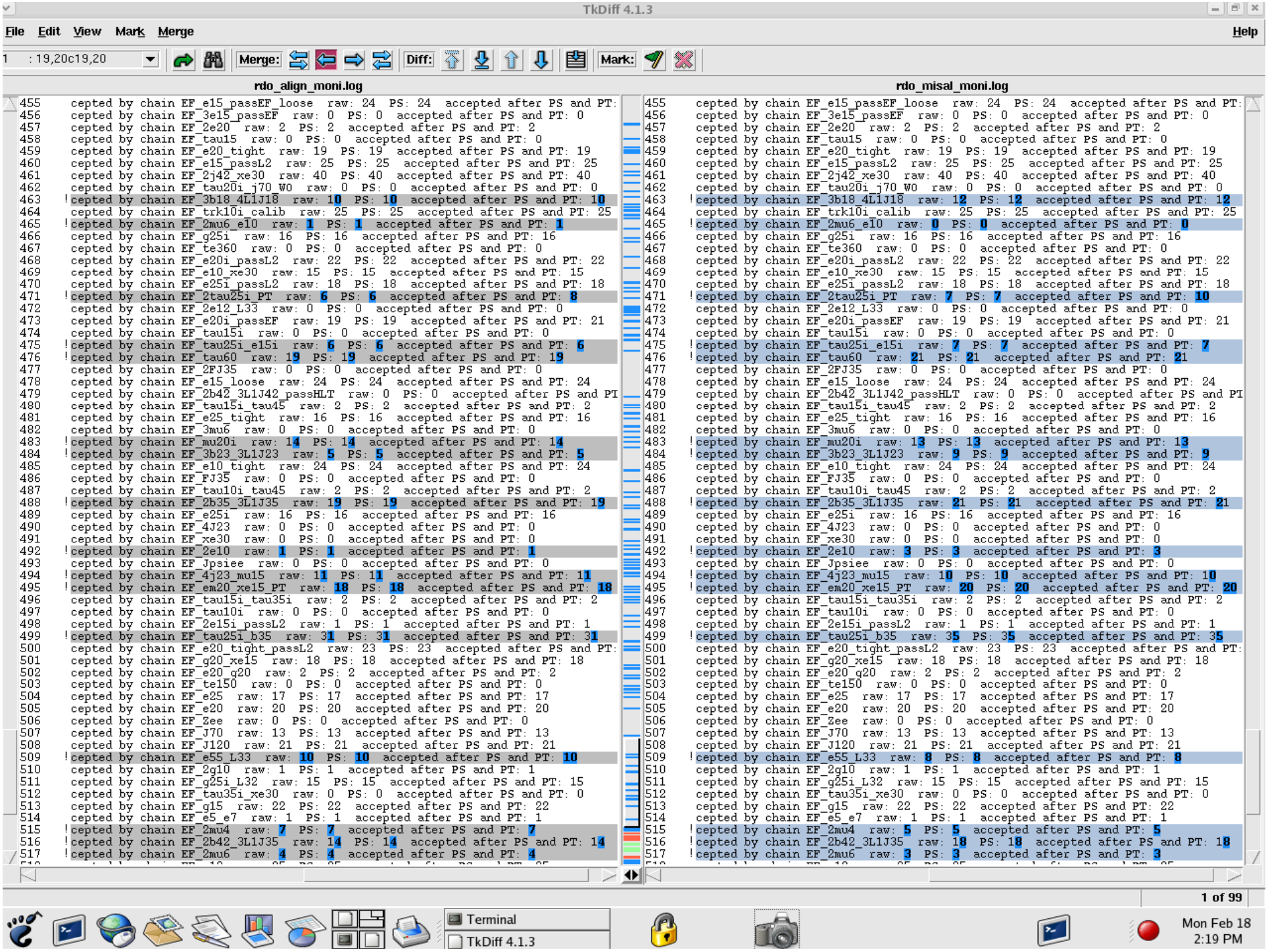
What to do…

- 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 avaibable)


TkDiff 4.1.3
File Edit View Mark Merge Help
1 : 19,20c19,20
Merge:
Diff:
Mark:
rdo_align_moni.log
rdo_misal_moni.log
1 of 99
Terminal
TkDiff 4.1.3
Mon Feb 18
2:19 PM

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

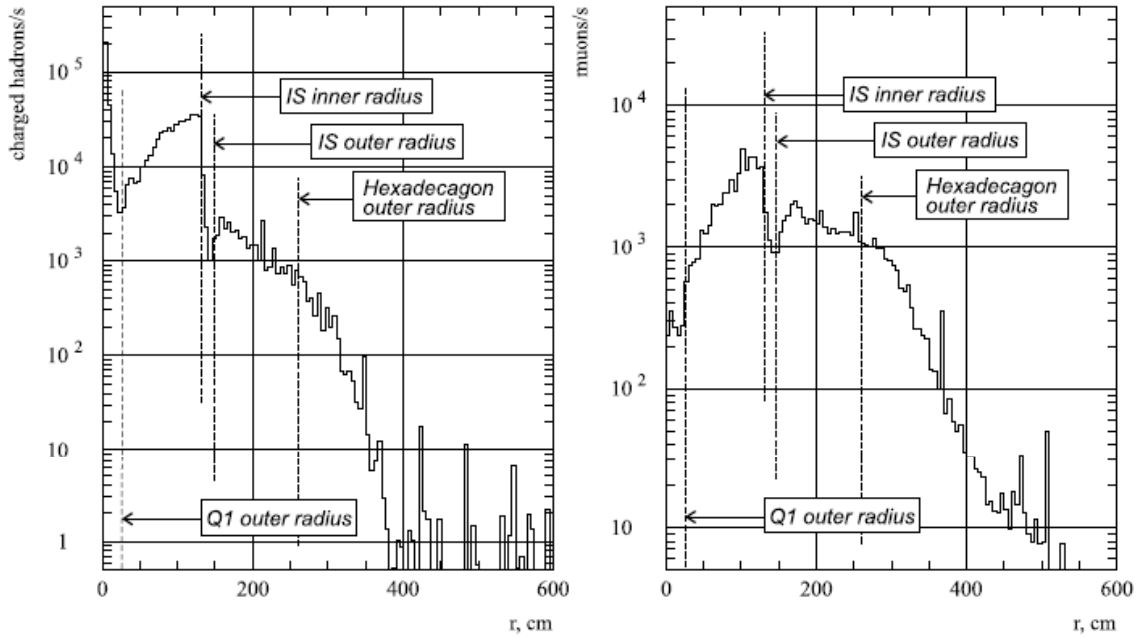


Figure 1: Radial distributions of charged hadron (left) and muon (right) flux at the UX15 entrance. Vertical lines on the plots show the limits of the material of the different elements — Q1 magnet, fixed tube of the inner shielding and hexadecagon of the outer one.

- 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 overlayed 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
```