# Slice Studies I

Goals of this session

ID/MS misalignment

Data samples for trigger studies

# Session goals

- The aim for this session is to start listing and evaluating the possible weaknesses of current trigger algorithms
- Two Slice Studies sessions: initially according to potential issues, but now mostly ad-hoc
- First step only! Issues raised here need to be followed up within each working group (slice)
- Should translate list of robustness issues into a list of data samples/code functionality needed for studies
  - A side effect of workshop preparations was getting experience with the data production machinery; this will be useful later

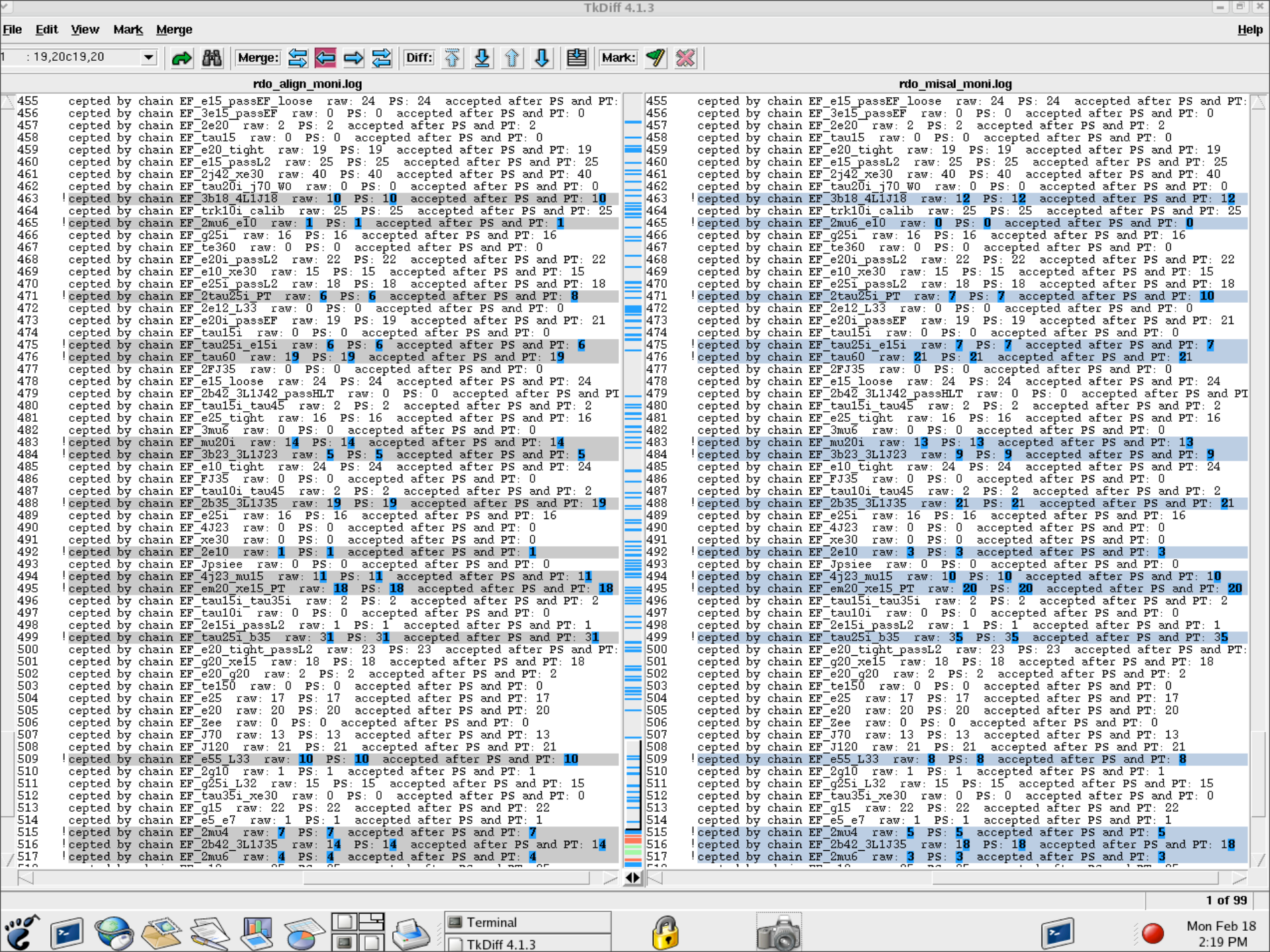
# Misalignment

- CSC Misaligned samples generated with **DetDescrVersion-01-02-00**
  - Corresponds to a 5 mm shift of the whole ID (what else?)
  - Too big for normal running: laser alignment can do better than this
  - But needs to be investigated

- In CSC samples, ID alignment is corrected back to nominal in the normal misaligned RDO samples by using the same geometry tag **DetDescrVersion-01-02-00**
  - Brings back perfect alignment: not realistic, especially for initial data
- Reconstrucing with nominal geometry (**DetDescrVersion-01-00-00**) also not reasonable - too much misalignment
- Three levels of Inner Detector 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
  - http://indico.cern.ch/getFile.py/access?contribId=76&sessionId=s5&resId=1&materialId=slides&confId=a0625
-

# Misalignment

- Several scenarios:
  - Alignment using FDR alignment constants obtained after 1 iteration (OFLCOND-FDR-01-02-00): “day 1” alignment constants used for FDR1 reprocessing
  - Alignment using “good alignment constants”:
    - OFLCOND-CSC-00-01-04: from the ID alignment group; correspond to expected alignment after “some time”
    - OFLCOND-CSC-00-01-05: used for detector paper
    - OFLCOND-CSC-00-01-06: OFLCOND-CSC-00-01-04 + LAR-CSC-000-00 (nominal LAr position)
- With Szymon Gadomski, we produced some (ID) misaligned data to investigate effect on HLT algorithms
  - Use OFLCOND-FDR-01-02-00 (needs DBRelease4.7.1)
  - Many thanks for Szymon, Pavel Nevski and Vakho Tsulaia for help with jobs, production system, and a new DBRelease tag!
- Muon slice used 3 scenarios: misal.ID+aligned MS, aligned ID +misal.MS, misal.ID+misal.MS
  - See talk by Andrea Ventura
- We should assess the trigger needs in terms of special data samples


TkDiff 4.1.3
File Edit View Mark Merge Help
: 19,20c19,20
Merge:
Diff:
Mark:
rdo_align_moni.log
rdo_misal_moni.log
cepted by chain EF_e15_passEF_loose raw: 24 PS: 24 accepted after PS and PT:
cepted by chain EF_3e15_passEF raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_2e20 raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_tau15 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e20_tight raw: 19 PS: 19 accepted after PS and PT: 19
cepted by chain EF_e15_passL2 raw: 25 PS: 25 accepted after PS and PT: 25
cepted by chain EF_2j42_xe30 raw: 40 PS: 40 accepted after PS and PT: 40
cepted by chain EF_tau20i_j70_W0 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_3b18_4L1J18 raw: 10 PS: 10 accepted after PS and PT: 10
cepted by chain EF_trk10i_calib raw: 25 PS: 25 accepted after PS and PT: 25
cepted by chain EF_2mu6_e10 raw: 1 PS: 1 accepted after PS and PT: 1
cepted by chain EF_g25i raw: 16 PS: 16 accepted after PS and PT: 16
cepted by chain EF_te360 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e20i_passL2 raw: 22 PS: 22 accepted after PS and PT: 22
cepted by chain EF_e10_xe30 raw: 15 PS: 15 accepted after PS and PT: 15
cepted by chain EF_e25i_passL2 raw: 18 PS: 18 accepted after PS and PT: 18
cepted by chain EF_2tau25i_PT raw: 6 PS: 6 accepted after PS and PT: 8
cepted by chain EF_2e12_L33 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e20i_passEF raw: 19 PS: 19 accepted after PS and PT: 21
cepted by chain EF_tau15i raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_tau25i_e15i raw: 6 PS: 6 accepted after PS and PT: 6
cepted by chain EF_tau60 raw: 19 PS: 19 accepted after PS and PT: 19
cepted by chain EF_2FJ35 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e15_loose raw: 24 PS: 24 accepted after PS and PT: 24
cepted by chain EF_2b42_3L1J42_passHLT raw: 0 PS: 0 accepted after PS and PT
cepted by chain EF_tau15i_tau45 raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_e25_tight raw: 16 PS: 16 accepted after PS and PT: 16
cepted by chain EF_3mu6 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_mu20i raw: 14 PS: 14 accepted after PS and PT: 14
cepted by chain EF_3b23_3L1J23 raw: 5 PS: 5 accepted after PS and PT: 5
cepted by chain EF_e10_tight raw: 24 PS: 24 accepted after PS and PT: 24
cepted by chain EF_FJ35 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_tau10i_tau45 raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_2b35_3L1J35 raw: 19 PS: 19 accepted after PS and PT: 19
cepted by chain EF_e25i raw: 16 PS: 16 accepted after PS and PT: 16
cepted by chain EF_4J23 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_xe30 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_2e10 raw: 1 PS: 1 accepted after PS and PT: 1
cepted by chain EF_Jpsiee raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_4j23_mu15 raw: 11 PS: 11 accepted after PS and PT: 11
cepted by chain EF_em20_xe15_PT raw: 18 PS: 18 accepted after PS and PT: 18
cepted by chain EF_tau15i_tau35i raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_tau10i raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_2e15i_passL2 raw: 1 PS: 1 accepted after PS and PT: 1
cepted by chain EF_tau25i_b35 raw: 31 PS: 31 accepted after PS and PT: 31
cepted by chain EF_e20_tight_passL2 raw: 23 PS: 23 accepted after PS and PT:
cepted by chain EF_g20_xe15 raw: 18 PS: 18 accepted after PS and PT: 18
cepted by chain EF_e20_g20 raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_te150 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e25 raw: 17 PS: 17 accepted after PS and PT: 17
cepted by chain EF_e20 raw: 20 PS: 20 accepted after PS and PT: 20
cepted by chain EF_Zee raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_J70 raw: 13 PS: 13 accepted after PS and PT: 13
cepted by chain EF_J120 raw: 21 PS: 21 accepted after PS and PT: 21
cepted by chain EF_e55_L33 raw: 10 PS: 10 accepted after PS and PT: 10
cepted by chain EF_2g10 raw: 1 PS: 1 accepted after PS and PT: 1
cepted by chain EF_g25i_L32 raw: 15 PS: 15 accepted after PS and PT: 15
cepted by chain EF_tau35i_xe30 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_g15 raw: 22 PS: 22 accepted after PS and PT: 22
cepted by chain EF_e5_e7 raw: 1 PS: 1 accepted after PS and PT: 1
cepted by chain EF_2mu4 raw: 7 PS: 7 accepted after PS and PT: 7
cepted by chain EF_2b42_3L1J35 raw: 14 PS: 14 accepted after PS and PT: 14
cepted by chain EF_2mu6 raw: 4 PS: 4 accepted after PS and PT: 4
cepted by chain EF_e15_passEF_loose raw: 24 PS: 24 accepted after PS and PT:
cepted by chain EF_3e15_passEF raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_2e20 raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_tau15 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e20_tight raw: 19 PS: 19 accepted after PS and PT: 19
cepted by chain EF_e15_passL2 raw: 25 PS: 25 accepted after PS and PT: 25
cepted by chain EF_2j42_xe30 raw: 40 PS: 40 accepted after PS and PT: 40
cepted by chain EF_tau20i_j70_W0 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_3b18_4L1J18 raw: 12 PS: 12 accepted after PS and PT: 12
cepted by chain EF_trk10i_calib raw: 25 PS: 25 accepted after PS and PT: 25
cepted by chain EF_2mu6_e10 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_g25i raw: 16 PS: 16 accepted after PS and PT: 16
cepted by chain EF_te360 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e20i_passL2 raw: 22 PS: 22 accepted after PS and PT: 22
cepted by chain EF_e10_xe30 raw: 15 PS: 15 accepted after PS and PT: 15
cepted by chain EF_e25i_passL2 raw: 18 PS: 18 accepted after PS and PT: 18
cepted by chain EF_2tau25i_PT raw: 7 PS: 7 accepted after PS and PT: 10
cepted by chain EF_2e12_L33 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e20i_passEF raw: 19 PS: 19 accepted after PS and PT: 21
cepted by chain EF_tau15i raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_tau25i_e15i raw: 7 PS: 7 accepted after PS and PT: 7
cepted by chain EF_tau60 raw: 21 PS: 21 accepted after PS and PT: 21
cepted by chain EF_2FJ35 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e15_loose raw: 24 PS: 24 accepted after PS and PT: 24
cepted by chain EF_2b42_3L1J42_passHLT raw: 0 PS: 0 accepted after PS and PT
cepted by chain EF_tau15i_tau45 raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_e25_tight raw: 16 PS: 16 accepted after PS and PT: 16
cepted by chain EF_3mu6 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_mu20i raw: 13 PS: 13 accepted after PS and PT: 13
cepted by chain EF_3b23_3L1J23 raw: 9 PS: 9 accepted after PS and PT: 9
cepted by chain EF_e10_tight raw: 24 PS: 24 accepted after PS and PT: 24
cepted by chain EF_FJ35 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_tau10i_tau45 raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_2b35_3L1J35 raw: 21 PS: 21 accepted after PS and PT: 21
cepted by chain EF_e25i raw: 16 PS: 16 accepted after PS and PT: 16
cepted by chain EF_4J23 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_xe30 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_2e10 raw: 3 PS: 3 accepted after PS and PT: 3
cepted by chain EF_Jpsiee raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_4j23_mu15 raw: 10 PS: 10 accepted after PS and PT: 10
cepted by chain EF_em20_xe15_PT raw: 20 PS: 20 accepted after PS and PT: 20
cepted by chain EF_tau15i_tau35i raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_tau10i raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_2e15i_passL2 raw: 1 PS: 1 accepted after PS and PT: 1
cepted by chain EF_tau25i_b35 raw: 35 PS: 35 accepted after PS and PT: 35
cepted by chain EF_e20_tight_passL2 raw: 23 PS: 23 accepted after PS and PT:
cepted by chain EF_g20_xe15 raw: 18 PS: 18 accepted after PS and PT: 18
cepted by chain EF_e20_g20 raw: 2 PS: 2 accepted after PS and PT: 2
cepted by chain EF_te150 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_e25 raw: 17 PS: 17 accepted after PS and PT: 17
cepted by chain EF_e20 raw: 20 PS: 20 accepted after PS and PT: 20
cepted by chain EF_Zee raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_J70 raw: 13 PS: 13 accepted after PS and PT: 13
cepted by chain EF_J120 raw: 21 PS: 21 accepted after PS and PT: 21
cepted by chain EF_e55_L33 raw: 8 PS: 8 accepted after PS and PT: 8
cepted by chain EF_2g10 raw: 1 PS: 1 accepted after PS and PT: 1
cepted by chain EF_g25i_L32 raw: 15 PS: 15 accepted after PS and PT: 15
cepted by chain EF_tau35i_xe30 raw: 0 PS: 0 accepted after PS and PT: 0
cepted by chain EF_g15 raw: 22 PS: 22 accepted after PS and PT: 22
cepted by chain EF_e5_e7 raw: 1 PS: 1 accepted after PS and PT: 1
cepted by chain EF_2mu4 raw: 5 PS: 5 accepted after PS and PT: 5
cepted by chain EF_2b42_3L1J35 raw: 18 PS: 18 accepted after PS and PT: 18
cepted by chain EF_2mu6 raw: 3 PS: 3 accepted after PS and PT: 3
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

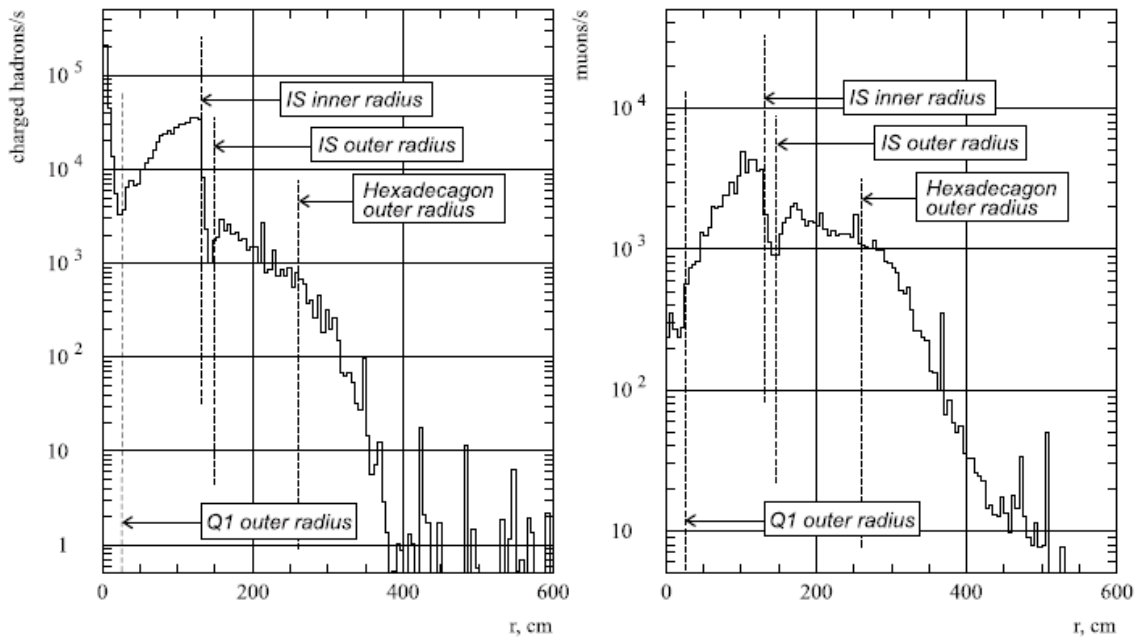



Figure 1: Radial distributions of charged hadron (left) and muon (right) flux at the UX15 entrance. Vertical lines on the plots show the limits of the material of the different elements — Q1 magnet, fixed tube of the inner shielding and hexadecagon of the outer one.

- 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
```