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May 31, 2001

Event Size,
Readout Time,
"Diagnostic" Banks,
...

For each system (except Si)

- **(Raw data banks)**
- **Is the readout time critical, too slow?**
- **Is the amount of data critical?**

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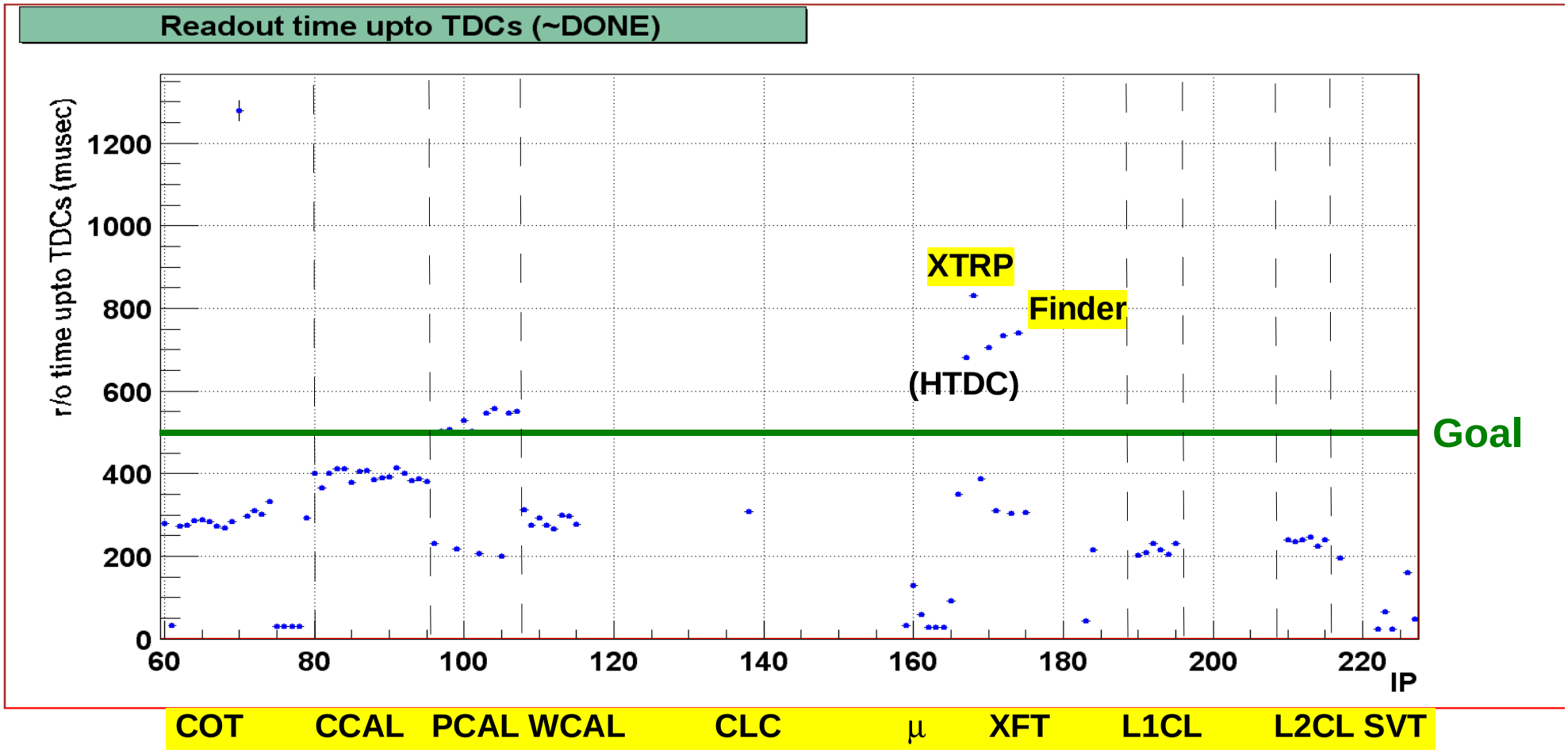
Overview I: Requirements

- Run 113483 (36x36, 1st store)
- Only TDC's are really sensitive to beam



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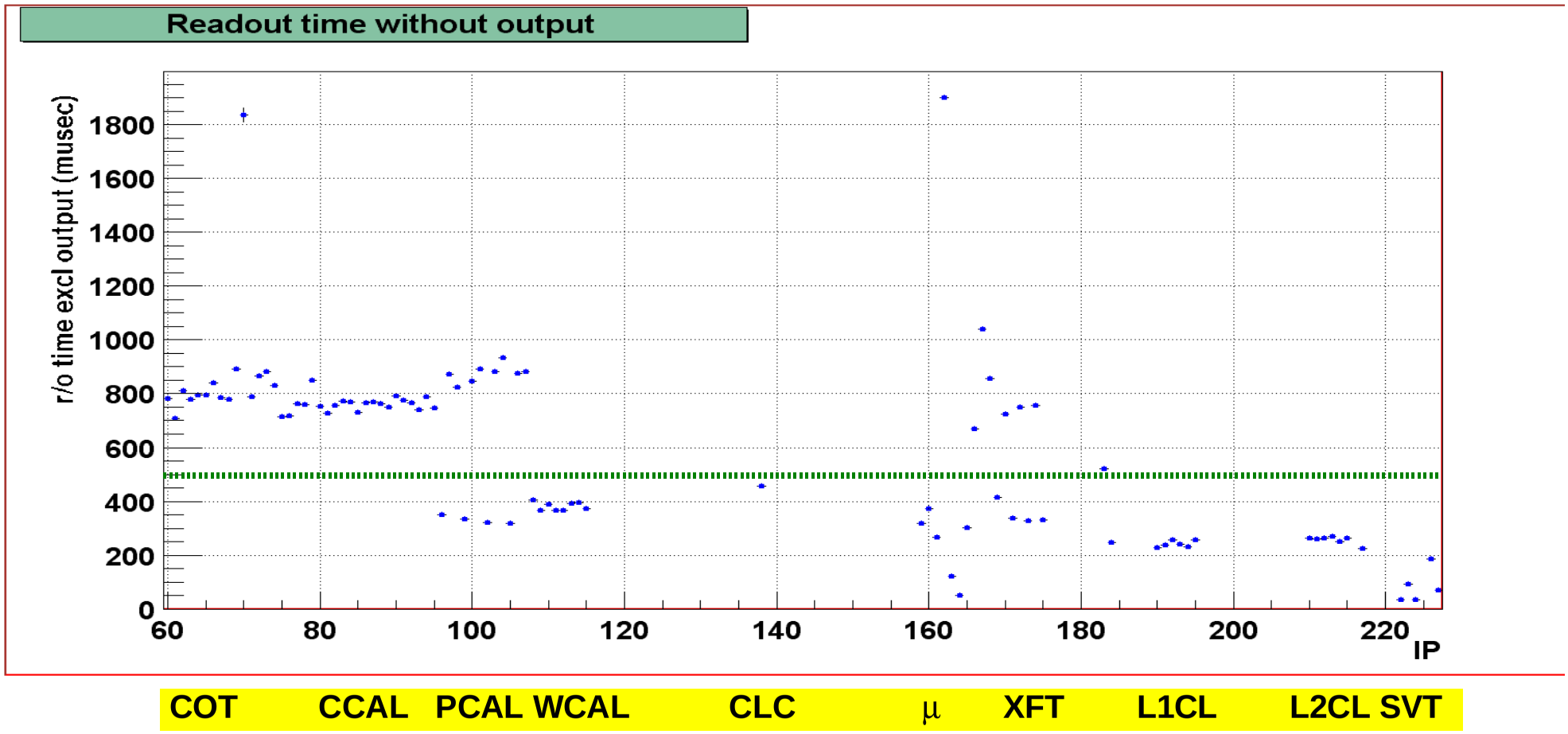
Overview II: Requirements

- Don't know how fast we need to be
- In the short term more important: fix outliers quickly



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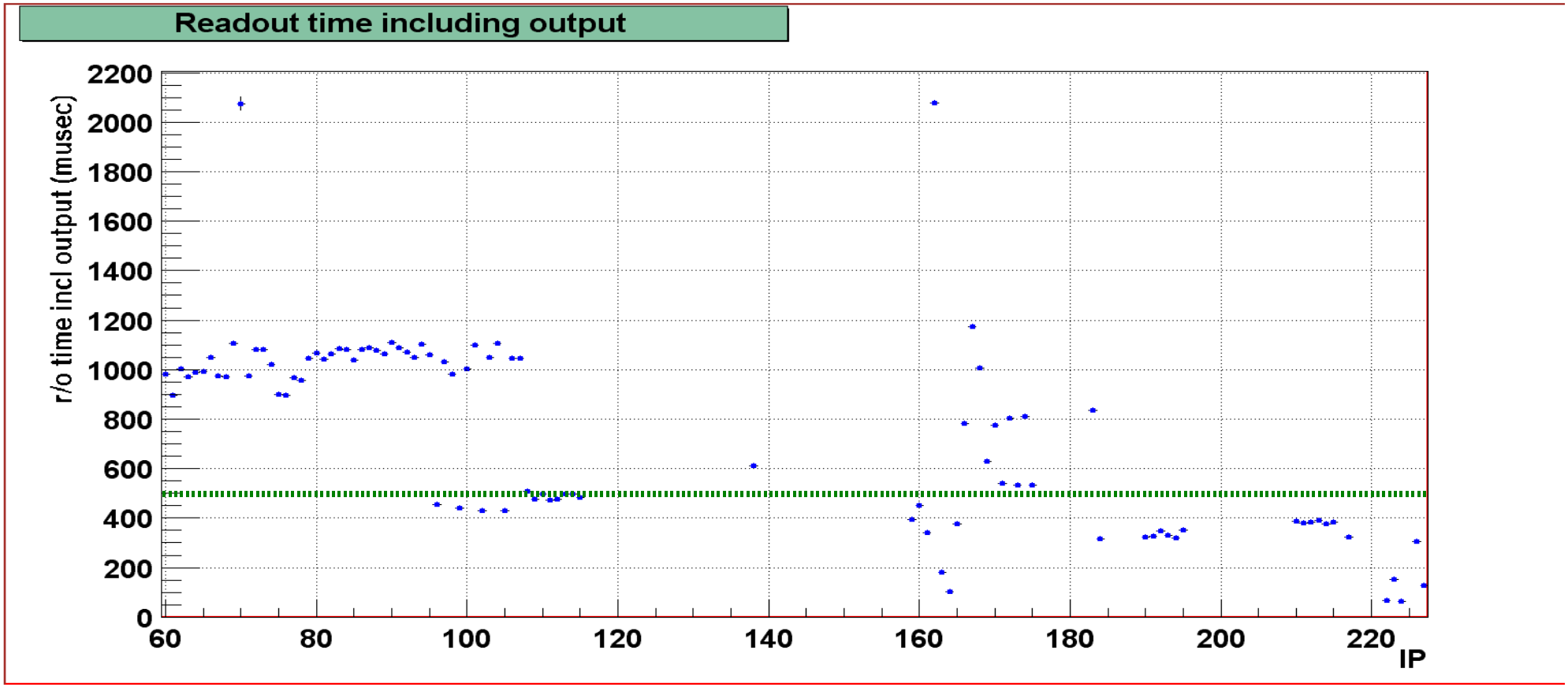
Overview III: Requirements



COT CCAL PCAL WCAL CLC μ XFT L1CL L2CL SVT

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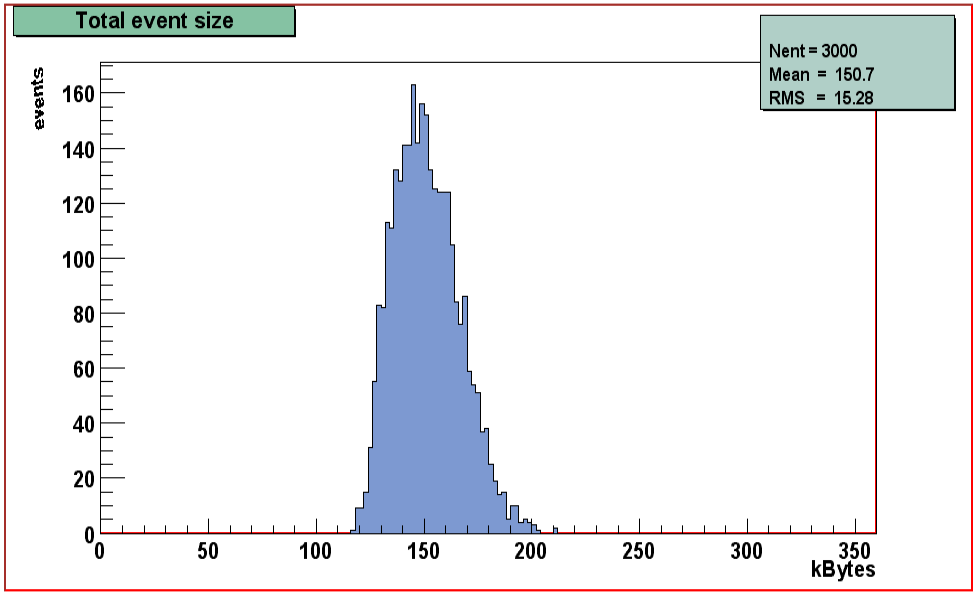
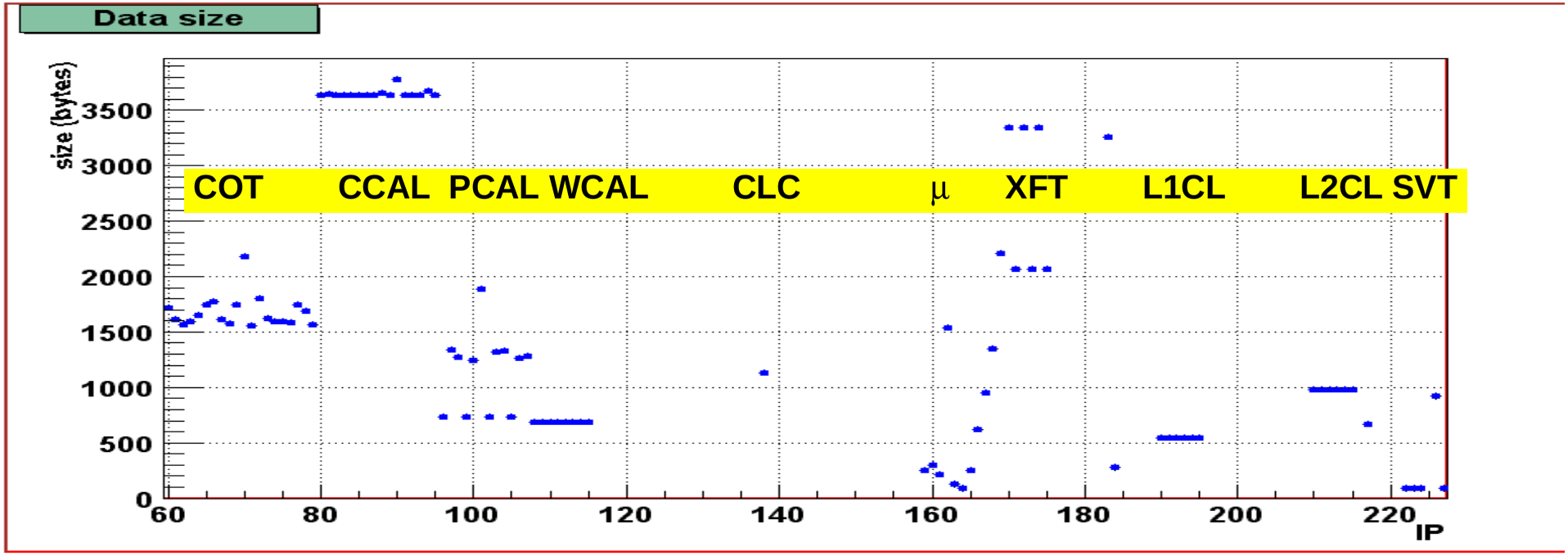
Overview Event Size

- Raw data banks only (no Si)





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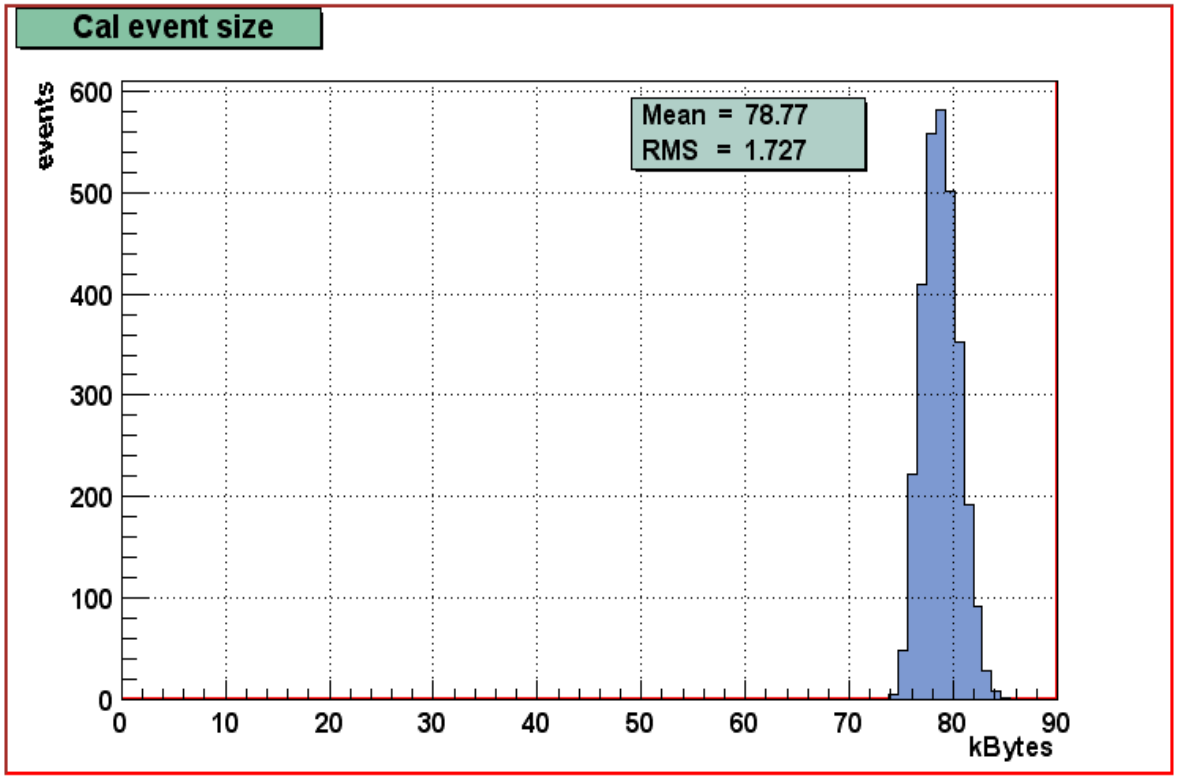
Calorimeter

- Close to 80kB in total
  - CCAL ~ 58 kB (no (?) zero-suppression in CES)
    CEMD CHAD CESD CPRD CCRD CSSD CSHD CSED
  - CHAD t ~ 1 kB HATD
  - PCAL ~ 14 kB PEMD PHAD PESD PPRD PSHD PSED
  - WCAL ~ 6 kB WHAD TOFD
- TDR: ~ 30 kB
  - (7 kB compressed)



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Level 1 + Level 2 Trigger

- Level 1: ~ 27 kB

XFT Finder	XFFD	~ 10 kB	Too slow	D
XFT Linker	XFLD	~ 6 kB		D
CalTrigger	TC1D	~ 3.3 kB		D
L1 Scalers	SL1D	~ 3.3 kB		
Muon Trigger	TCMD	~ 2.2 kB		
XTRP	XTRD	~ 1.3 kB	Too slow	D
L1 Global	TFRD	~ 0.2 kB		

- Level 2: ~ 8 kB

CalTrigger	TC2D	~ 6 kB		D
SVT	SVTD+X	~ 1.3 kB	(unrealistic setup)	
Level 2 Decision	TL2D	~ 0.7 kB		

(D = "Diagnostic Bank" according to CDF 4152)

- TDR: ~ 30 kB

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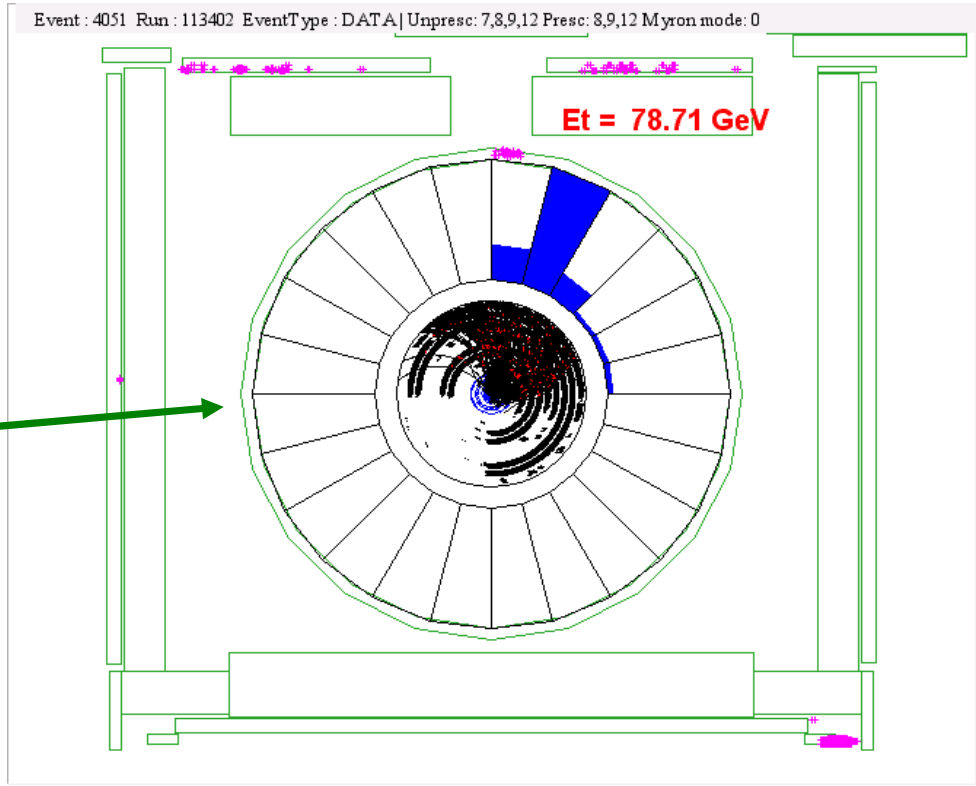
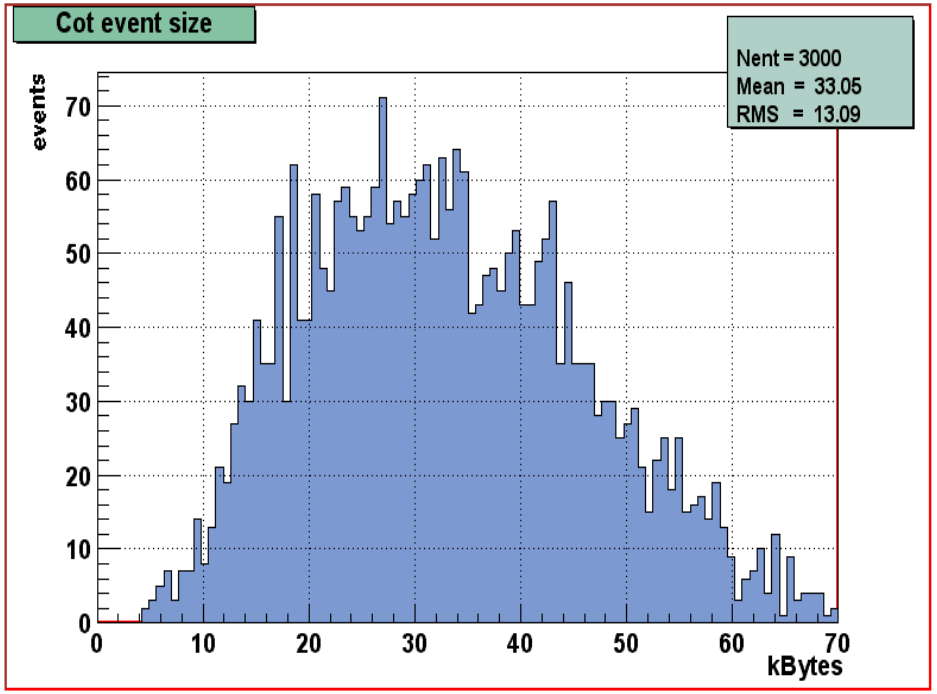
COT Data Volume

- Raw data: ~ 32 kB
- TDR: ~ 26 kB

"Data truncated" example





- Currently: up to 8 hits/channel
- 4 hits/channel → no more data truncation!
- Would also somewhat reduce long tails in TDC readout time

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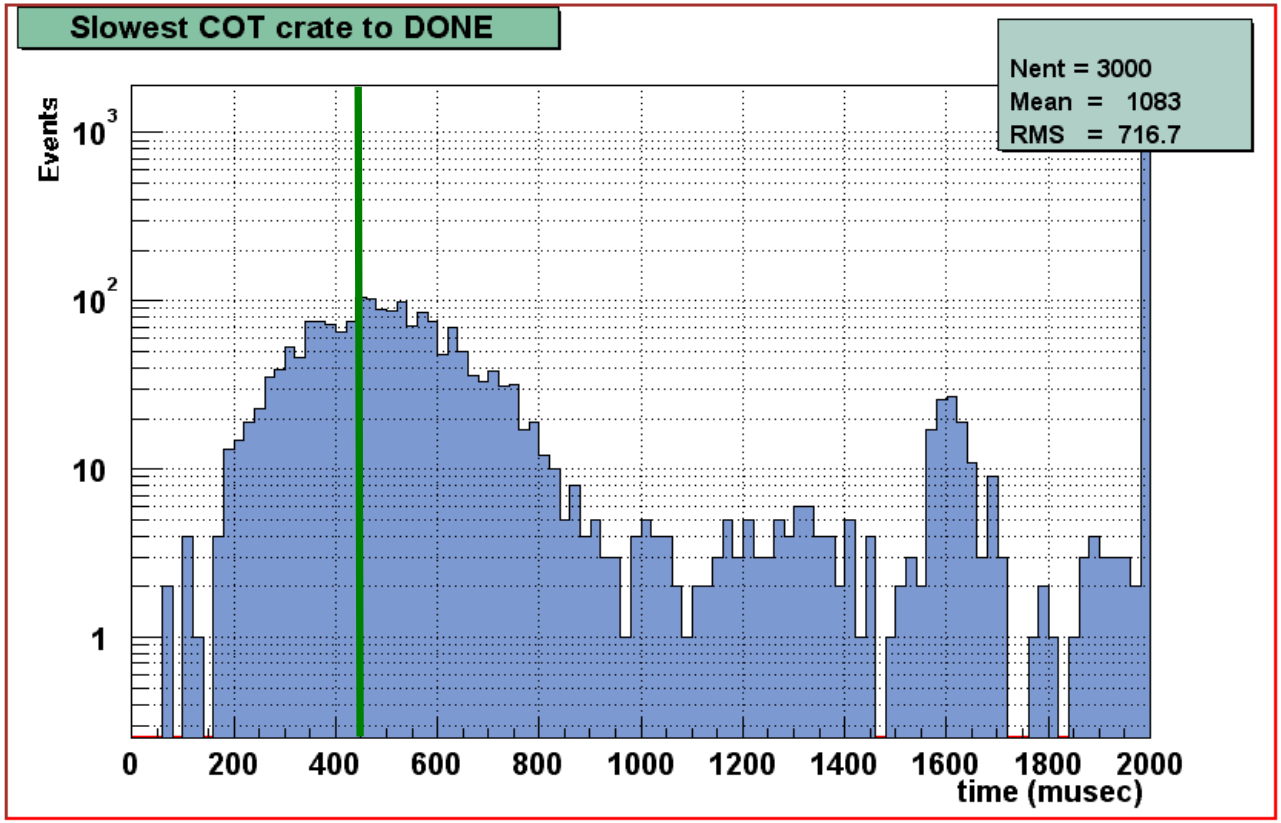
COT Readout Time



- This is purely the DSP processing time, no readout
  - Even assuming no impact of readout on livetime, this might be too slow for Run IIB!
- 0.45ms was mentioned in upgrade meetings as benchmark for Run IIB

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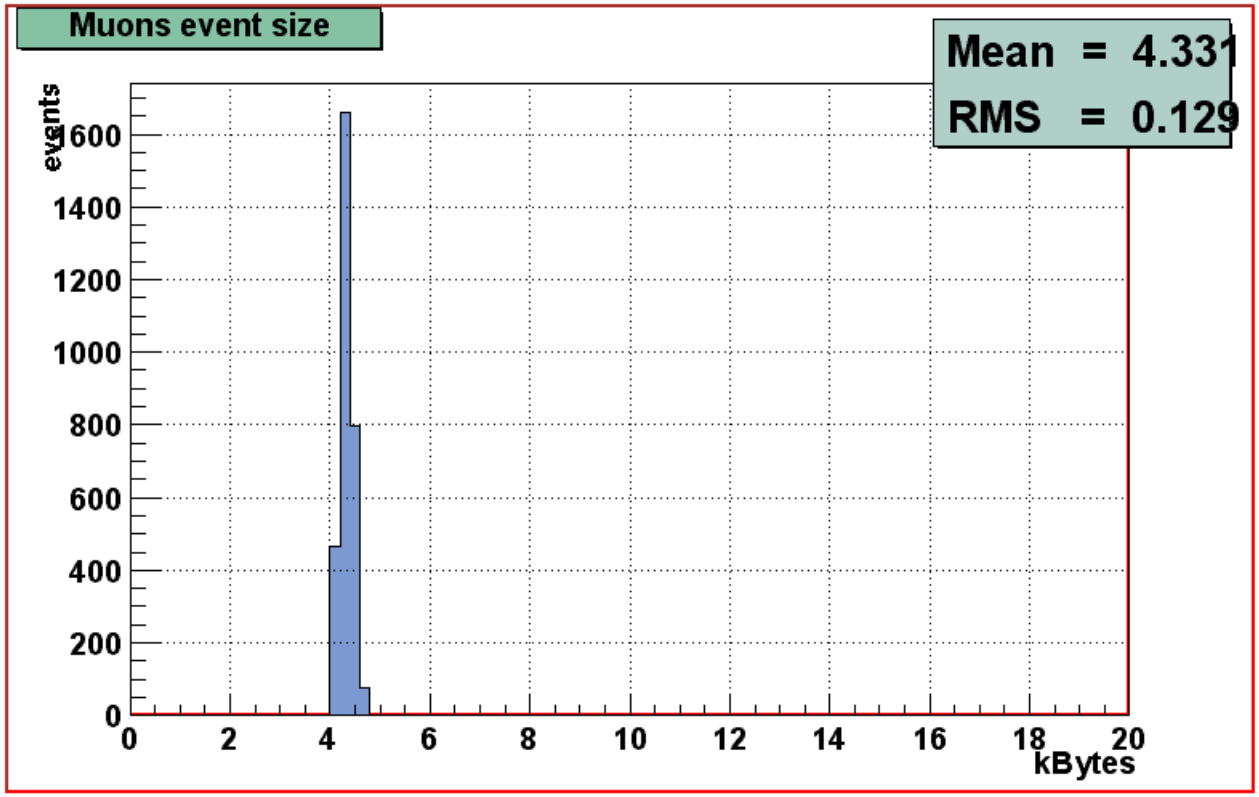
Muon Systems

- CMUD, CMPD, CMXD, CSPD, CSXD, BMUD, TSUD, BSUD
- ~60-70% read out, some noisy TDC's/chambers, ... → too early for conclusions
- TDR: ~ 2 kB



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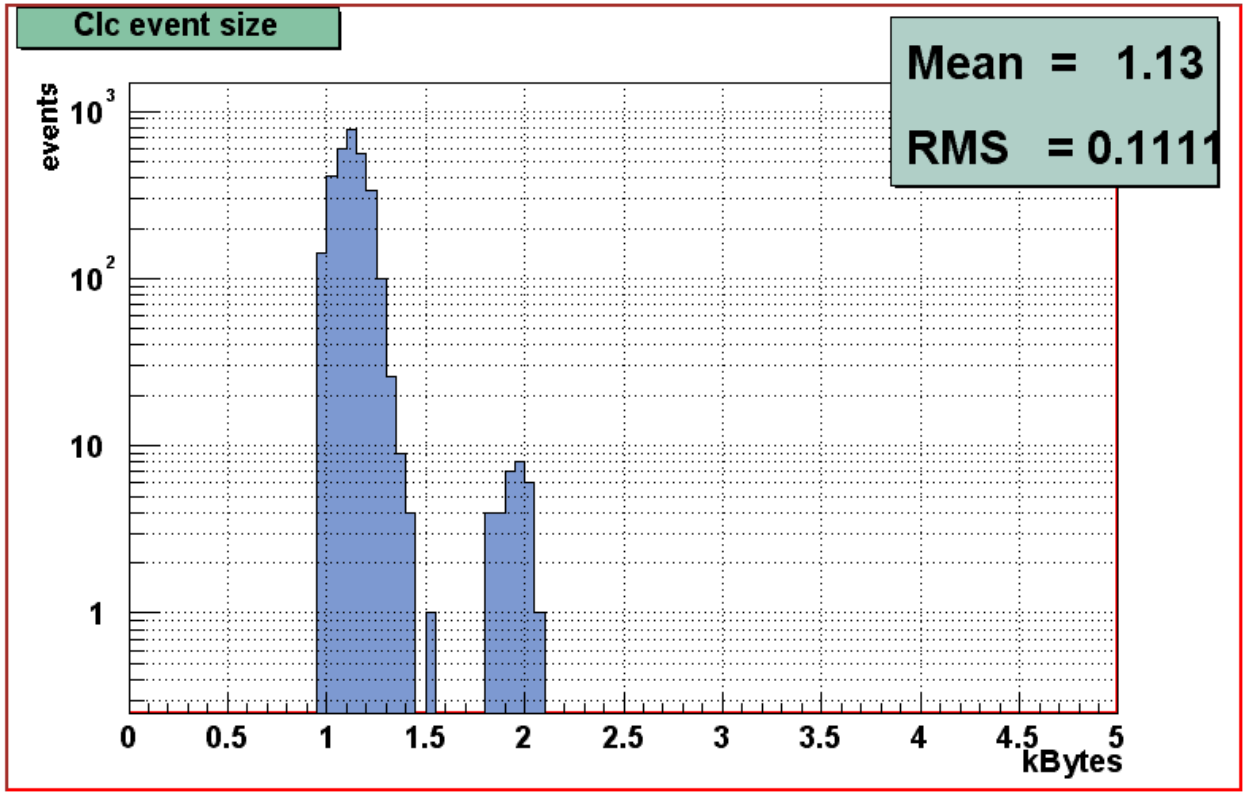
CLC / BSC

- CLC
  - CLAD (AdMems), CLTD (TDC), CLLD (DPM, recently doubled in size)
- BSC
  - FDAD (AdMems), FDLD (DPM)
- Since ~ April 13: FDLD is read out in 1% of all events

- What about CLLD?



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Implementation Notes

- Implementing TS readoutlists in the readout code is straightforward
- Need specification
- Prefer to "hard-code" the list of banks in the code (i.e. not configured from database)
- Until the full implementation (including L2/TS) is fully debugged, should have a default readoutlist that includes all banks
- Can do simple "prescaling" of banks a la FDLD in addition
  - Is this preferable for cases which do not require specific trigger conditions?