Status of ECL-TRG Readout

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TRG DAQ Workshop

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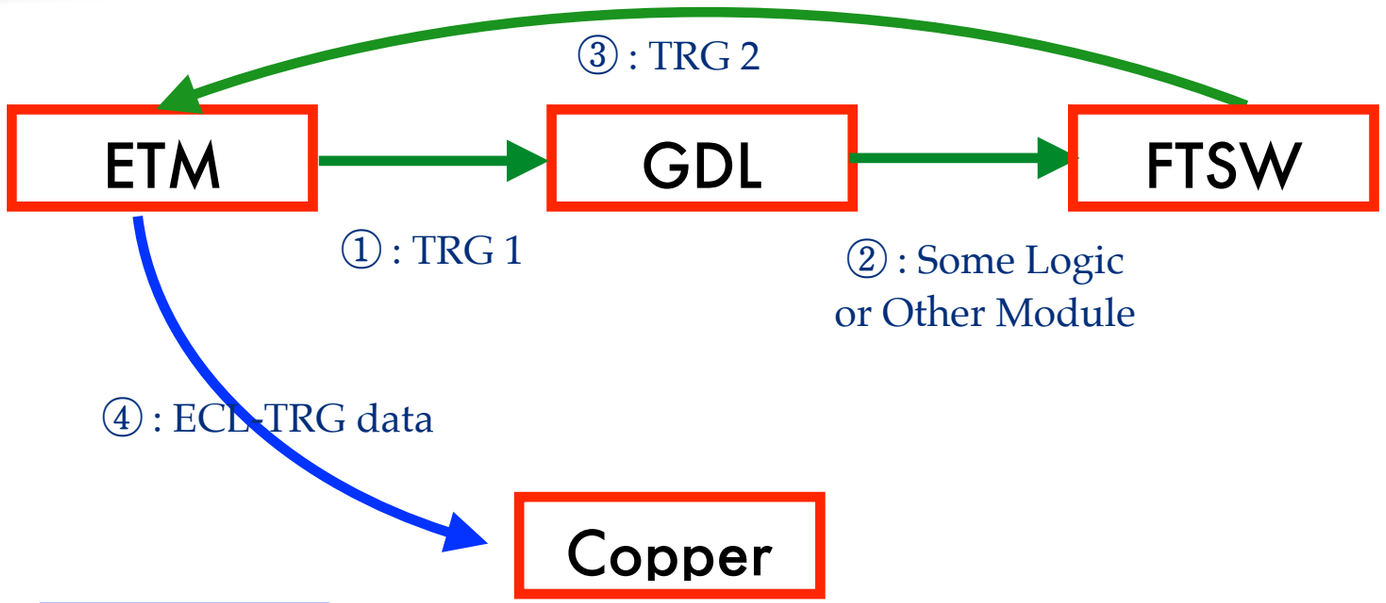
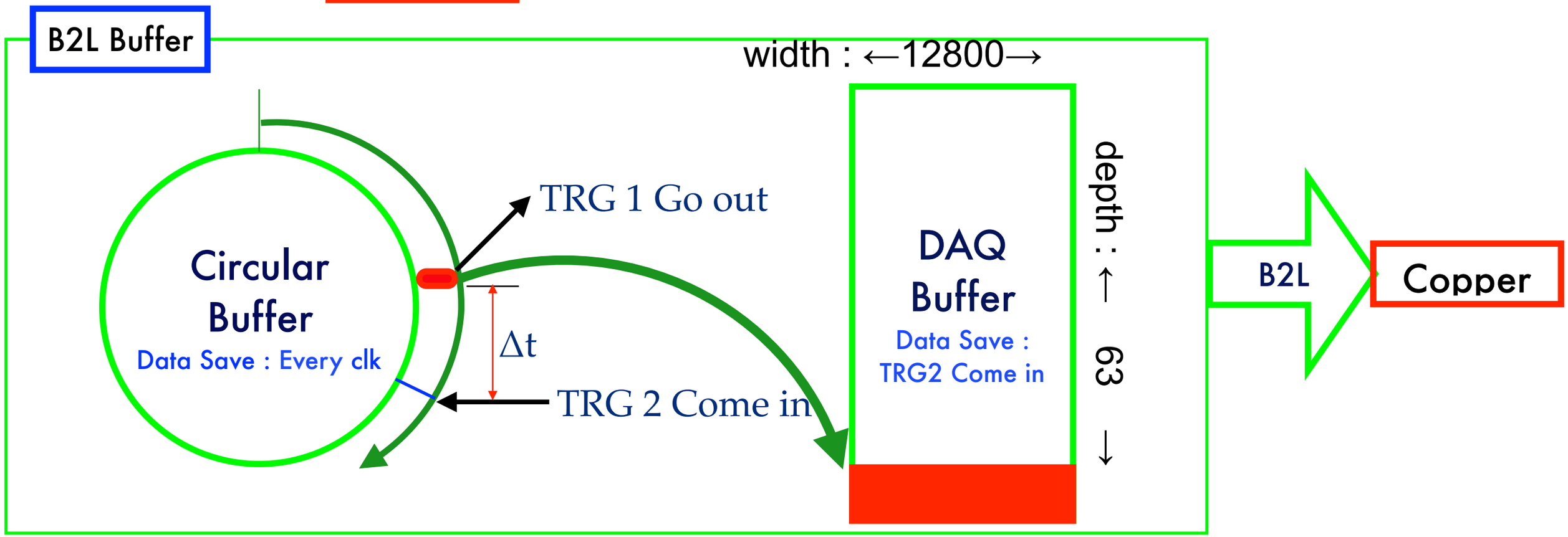
- ETM data
- Cosmic Run study
- Plan

B2Link Buffer (Diagram)



Latency : ① ~ ③ = Δt

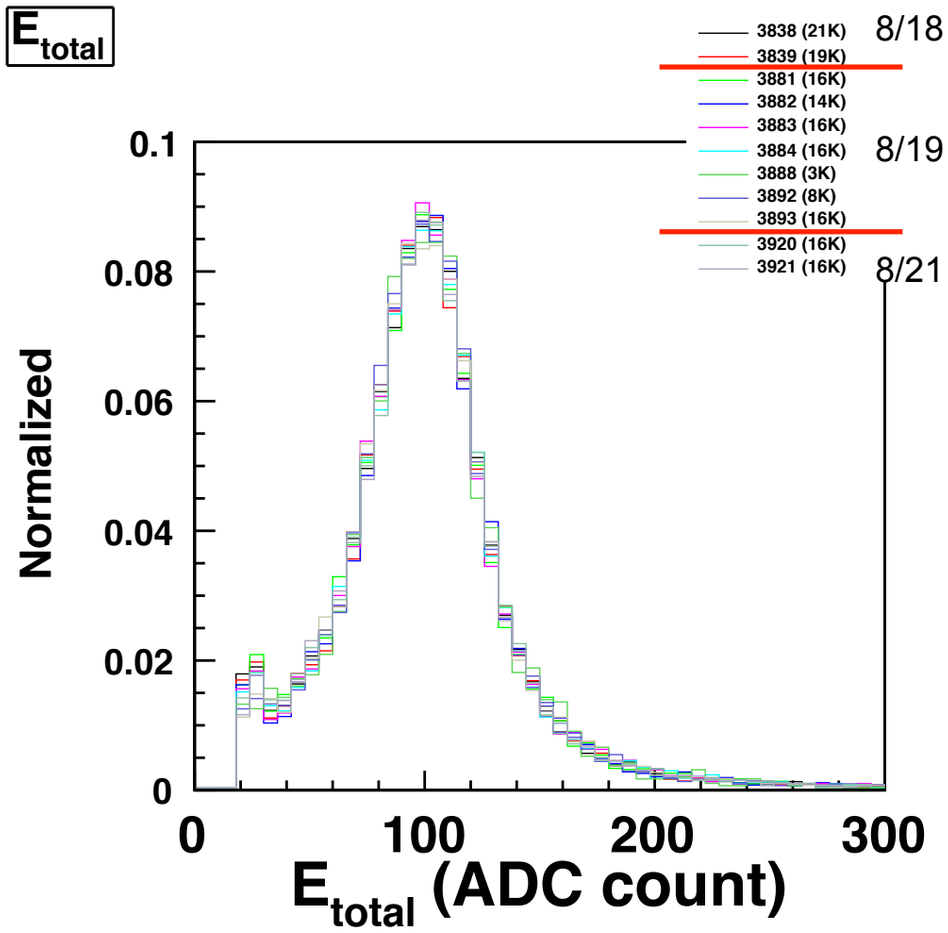


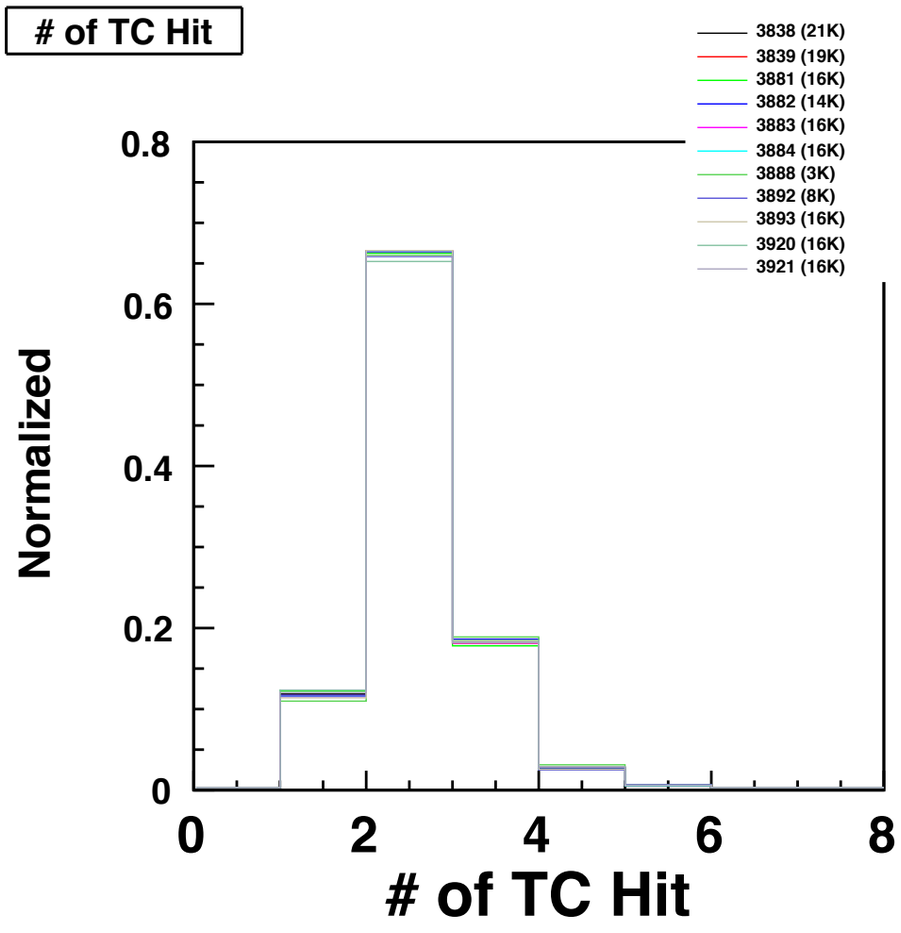
Cosmic Run Status (Local Run)

- Data taking @ EH with stability check
  - 24. Nov. 2016 : 8M (~1K Hz, ECL & ECL-TRG data)
  - 31. Mar. 2017 : 60M (~1K Hz = 16.7 hour, ECL-TRG only)
  - 8. May 2017 : 80M (~1K Hz = 22.2 hour, ECL-TRG only)
  - These data are used for ECL-TRG timing & energy calibration.
- In order to store one data, we need ~12.320 μs (theoretically).
  - If Average TRG rate is less than ~80 KHz, ETM B2L buffer will not be full.
- Nov. 2016, we performed stress test (w/o GDL) short time (~X min)
  - 68 KHz condition : (O)
  - 74 KHz condition : (O)

Cosmic Run Status (Global Run)

- Performance Test
  - Quickly check some GCR after shutdown.

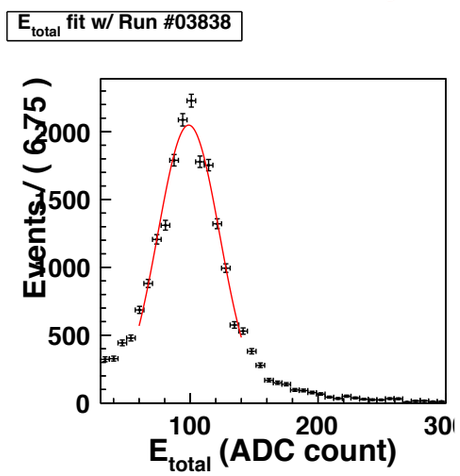


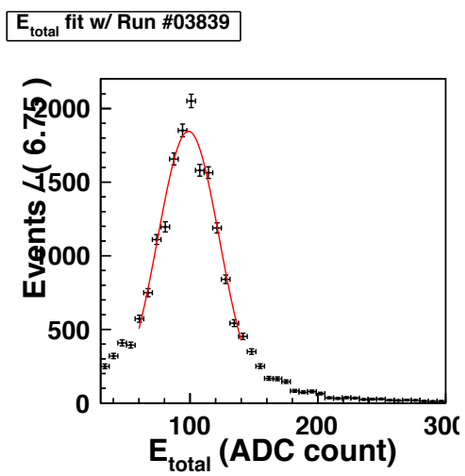


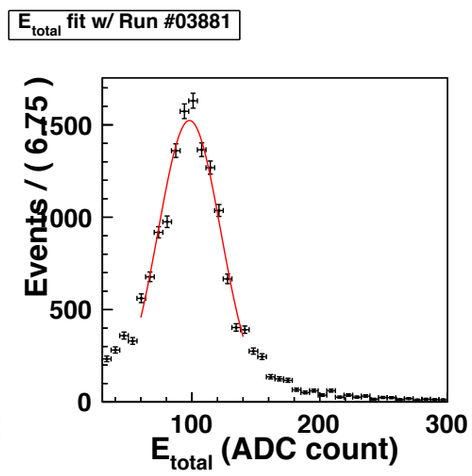
- Data set : qasrv01:/data2/storage/srootfiles/00001/run # /XZXCASR.f00000.sroot

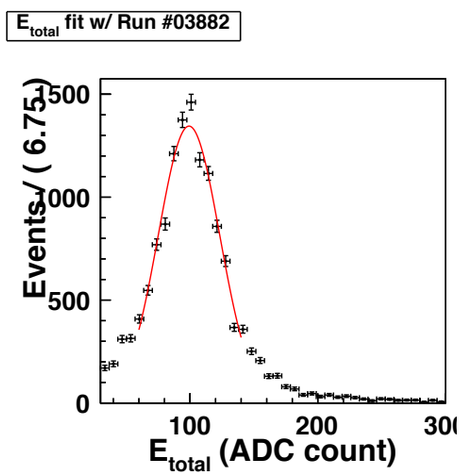
Cosmic Run Status (cont'd)

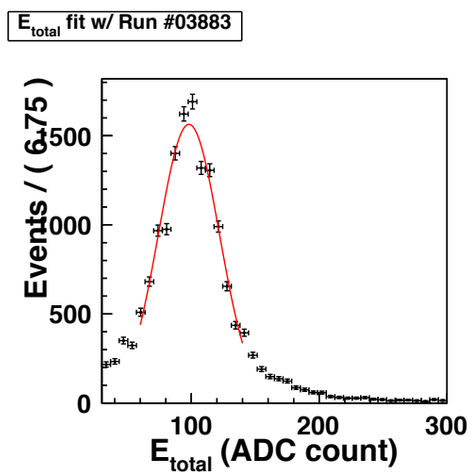
- Performance Test
  - Quickly check some GCR after shutdown.

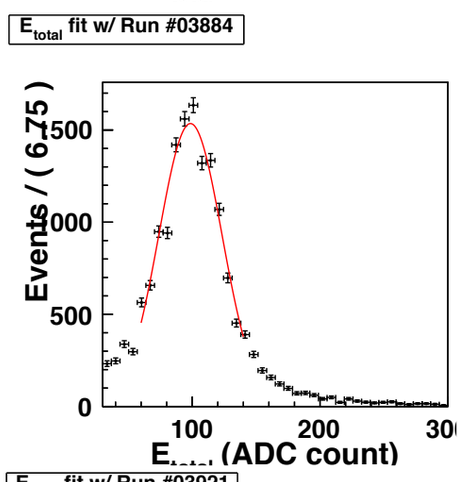


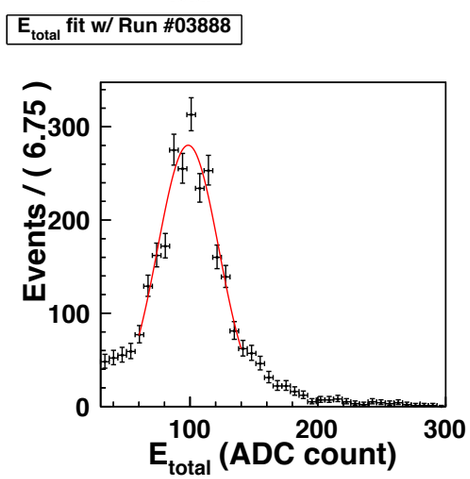


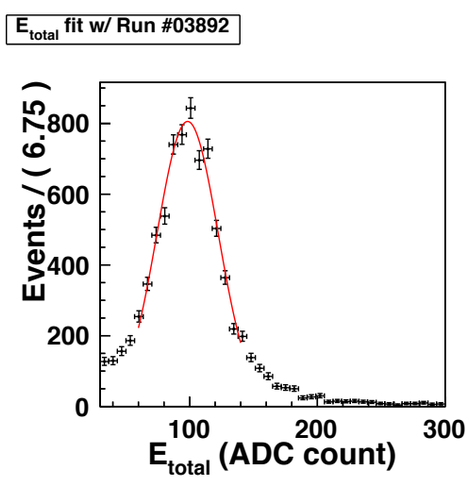


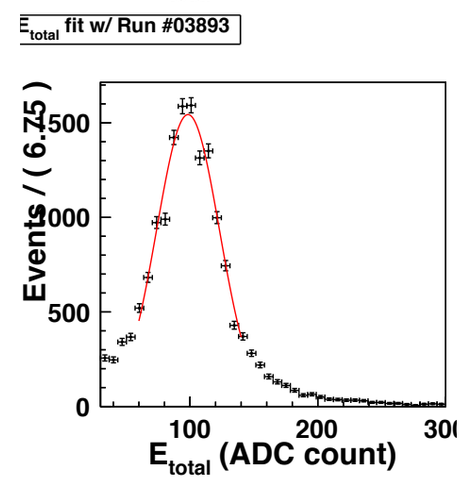


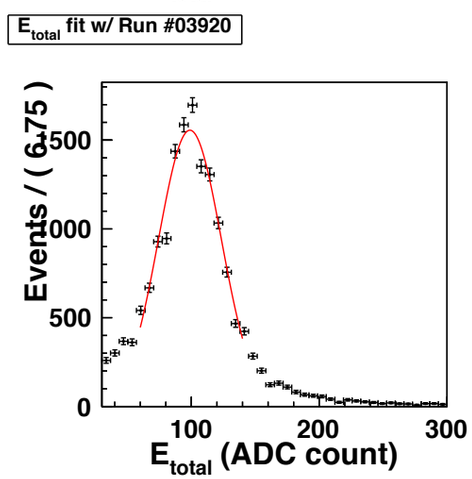


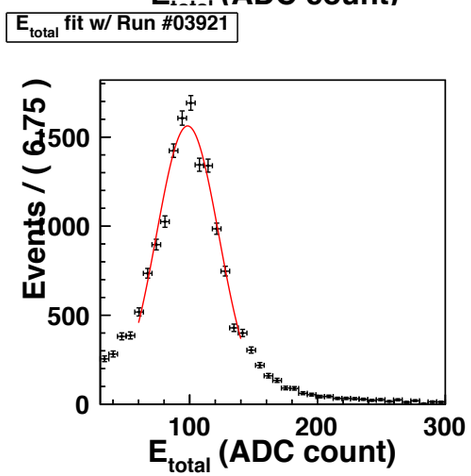








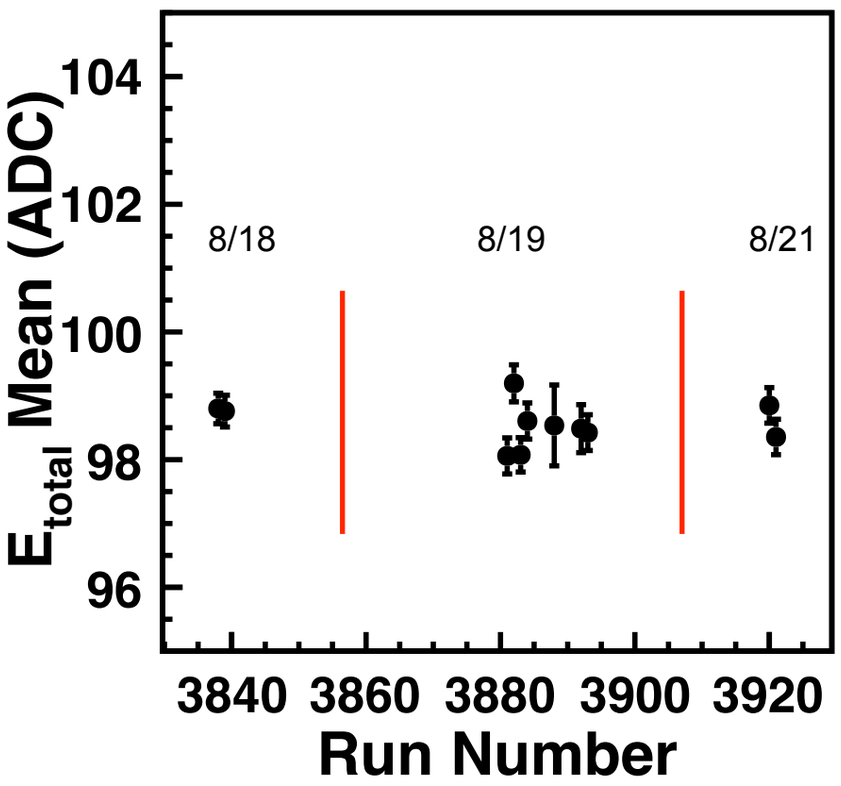




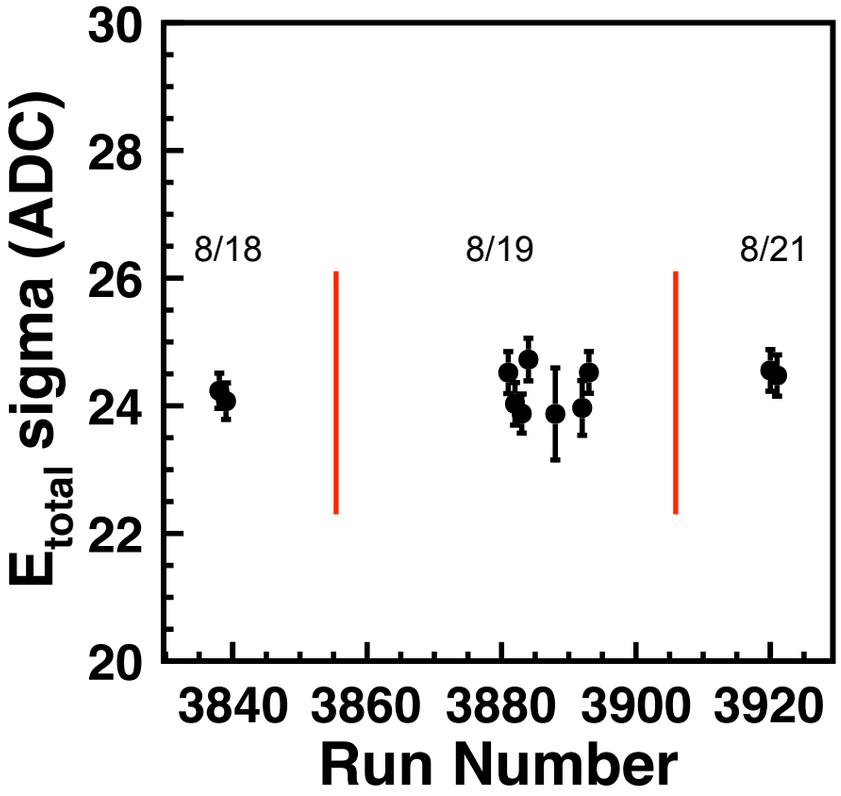
Cosmic Run Status (cont'd)

- Performance Test
  - Quickly check some GCR after shutdown.

E_{total} Mean



E_{total} sigma



- ECL-TRG group will check performance in detail.

ETM Data Format (Aug. 2017)

- ECL-TRG data : 12800 bit
  - TC information : 576 TC × 22 bit
    - 1 bit flag, 9 bit timing, 12 bit energy
  - ECL TRG timing : (ECL & Other group request)
    - FTSW counter, Fine timing

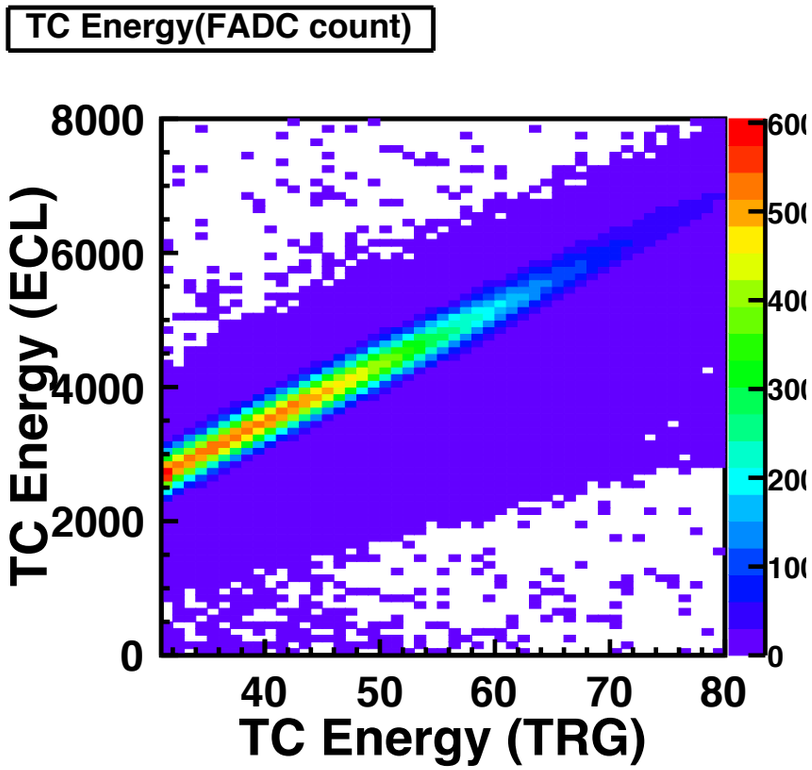
- All informations can be executed by ECL-TRG Unpacker.
  - DQM, timing & energy calibration will be performed from unpacked data.
- Unfortunately, (June & July) 1st GCR data don't include ECL-TRG timing.
  - We can use only ECL-TRG TC information.
- Updated ETM firmware will be used from (Aug.) 2nd GCR.

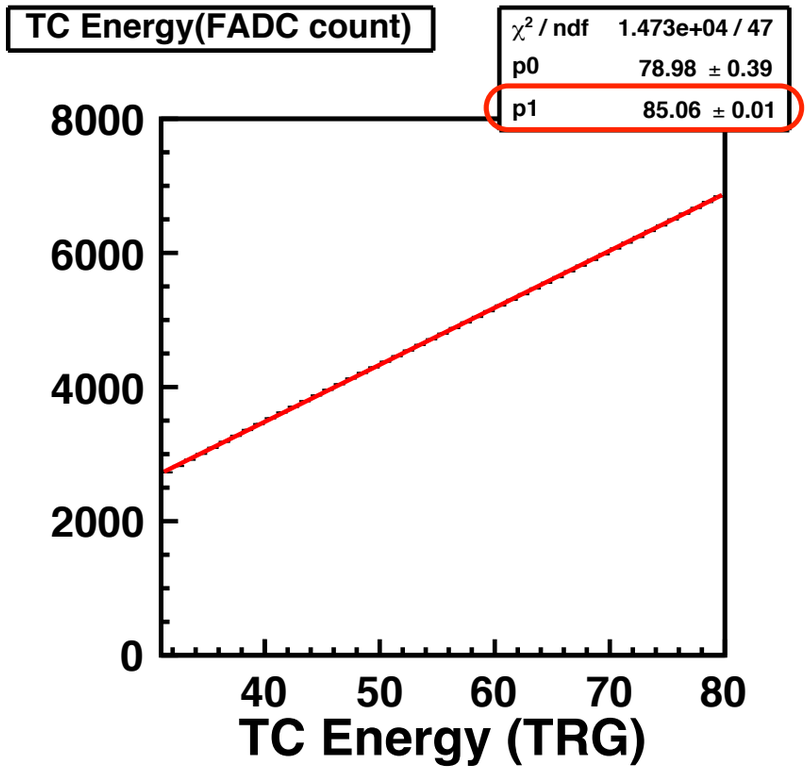
Cosmic Run Study (Local Run data)

- Data : Nov. 2016 (ECL & ECL-TRG data, ~1K Hz)
  - Energy & Timing calibration were not done.
  - 1 ECL-TRG ADC counter : 3.3 MeV
  - = 1 ECL ADC × 85

ecl trg

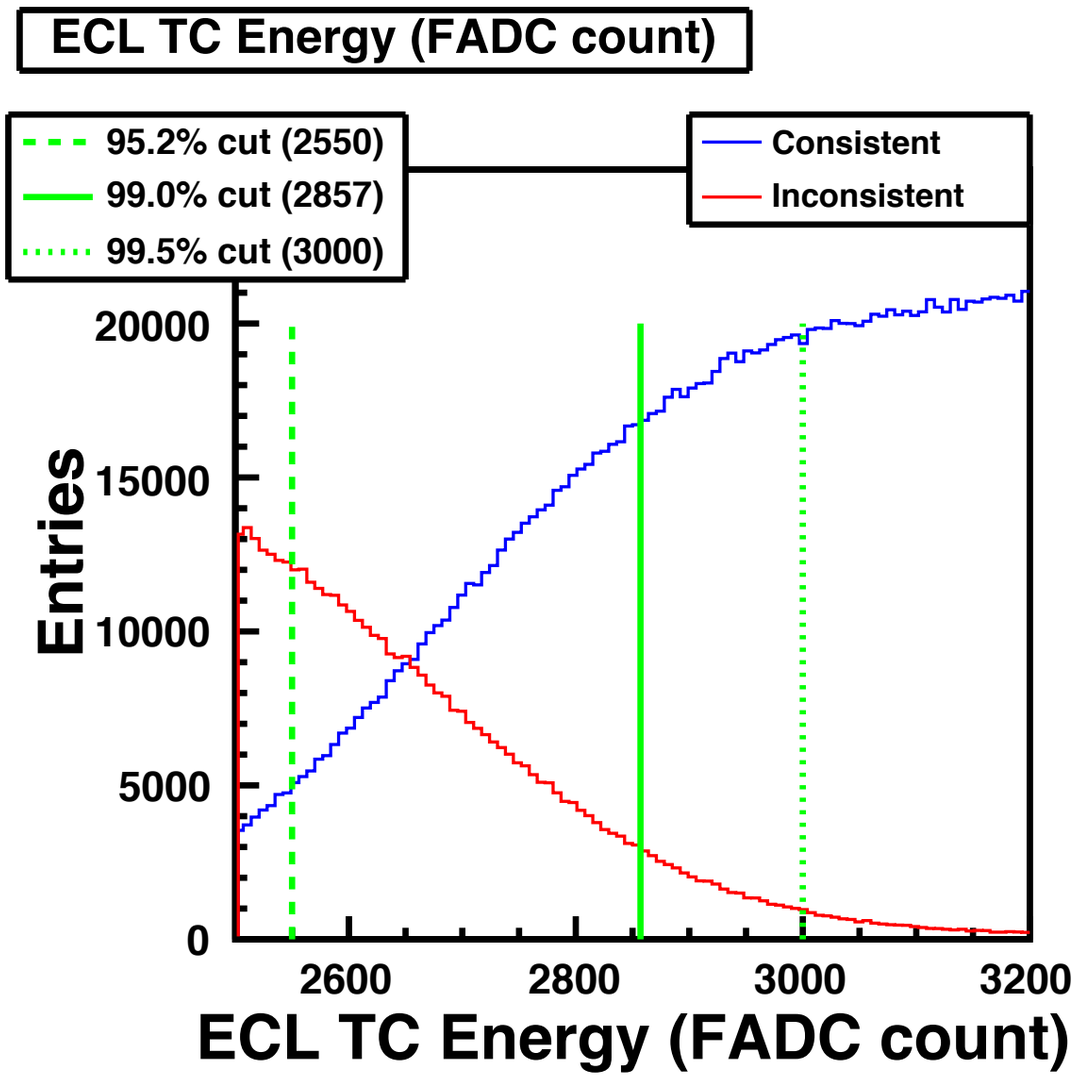
- We apply 100 MeV (2550 & 30) cut for both data.
- 1to1 corresponding rate : 95.2 %





Threshold Energy Boundary

- If we apply more correct number for boundary cut, we'll get good consistency.
- Energy calibration study is needed.

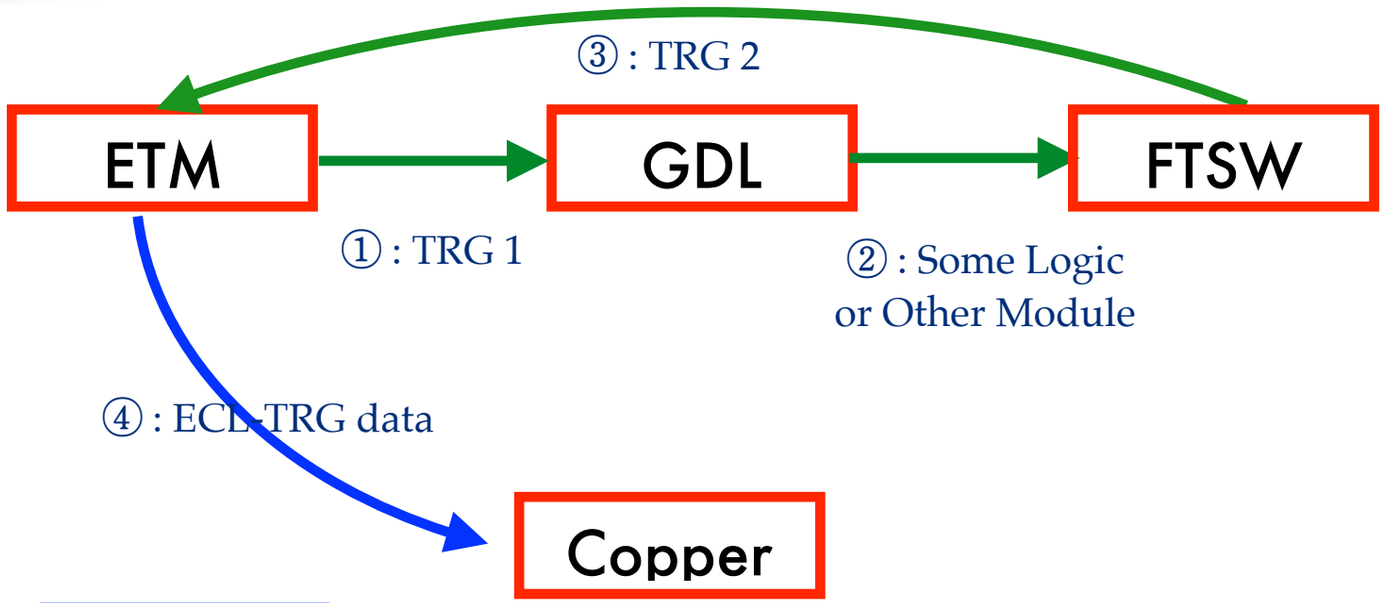


- 2550 : 85 × 30
- 2857 : 100 MeV / 35 keV
- 3000 : Arbitrary number

Plan

- B2Link buffer modification Study
  - Zero suppression study is ongoing.
  - After that B2Link buffer modification is needed.
  - We plan to store more wide ECL-TRG data.
    - Current firmware
      - Timing decision : 3 window
      - Store : 3 window
    - New firmware (plan)
      - Timing decision : 2 window
      - Store : 10 window
- Stress / Stability test with new firmware (plan)
- ECL-TRG timing & energy calibration study (Y.J. Kim)

B2Link Buffer (Diagram) : Plan



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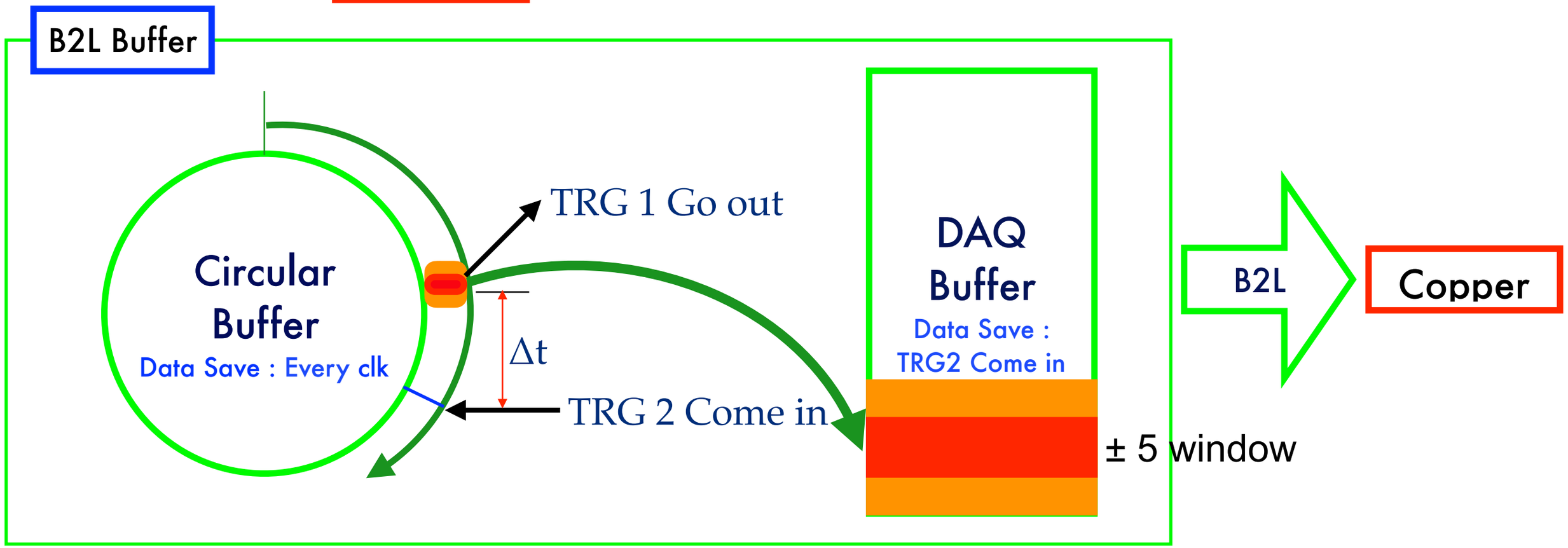

Backup