Recent TB activities

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TB campaign

- Done at MedAustron on 06. May 2023

- Goals:

  - New Trigger Number based sync concept

    - AIDA TLU mode

    - Sampling Trigger Output of TLU by FW

    - Counting trigger pulses

  - Test TJ-Monopix2 and RD50-MPW3 in parallel to test envisaged DESY setup

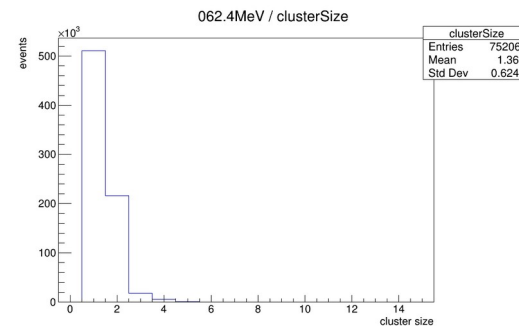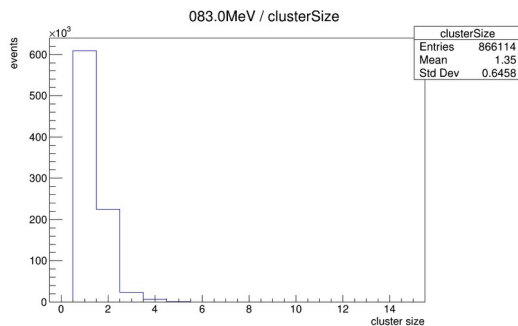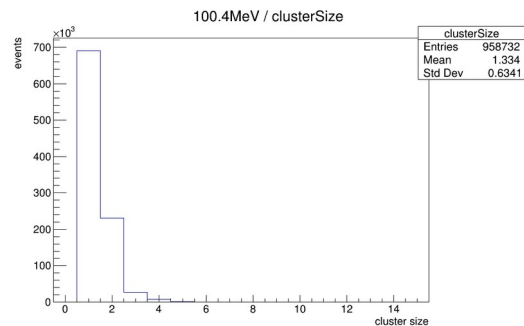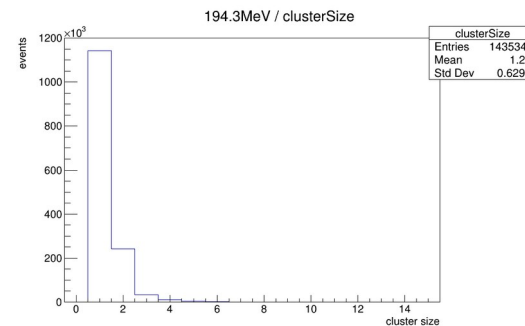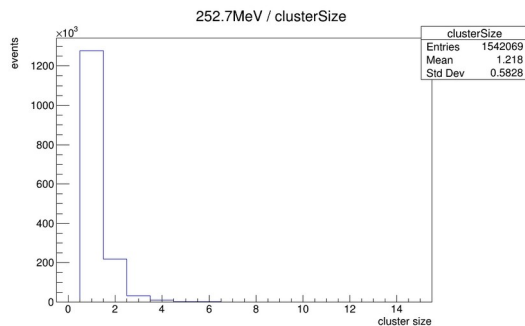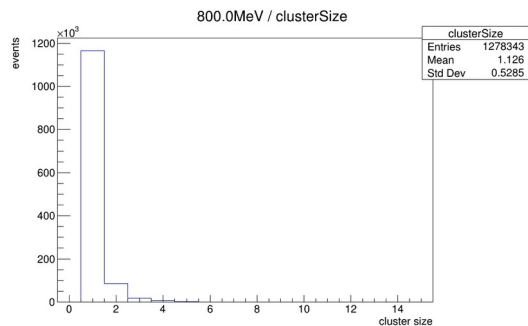 - Energy Scans
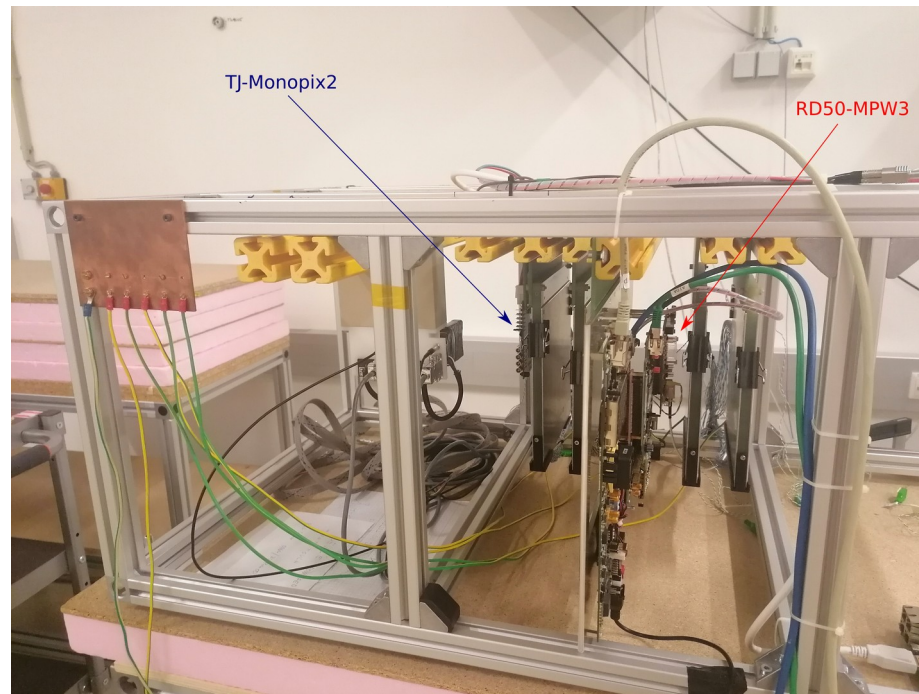
Trigger-Number based sync concept

- Tracker operated in EUDET mode
  - Trigger-Number sampling
  - Correlations between planes ✓
- MPW3 operated in AIDA mode
  - Trigger pulse counting
  - No correlations observed ✗
  - Correlatable by timestamps, bad efficiency though
- Comparing trigger numbers of different events → TLU and tracker miss some
  - MPW3 not missing a single one
  - Known bug in TLU when two scintillator signals arrive „too fast" after another (avoidable by setting *inX_STR* in EUDAQ config)
  - Theory: when TLU fails to write, internal counter += 2, only 1 trigger pulse→ Synchronization lost
- Currently investigating different TLU mode: *Synchronous Mode With Trigger Number*
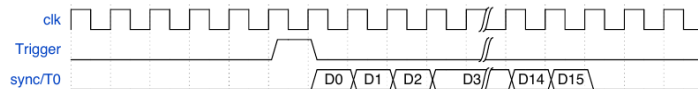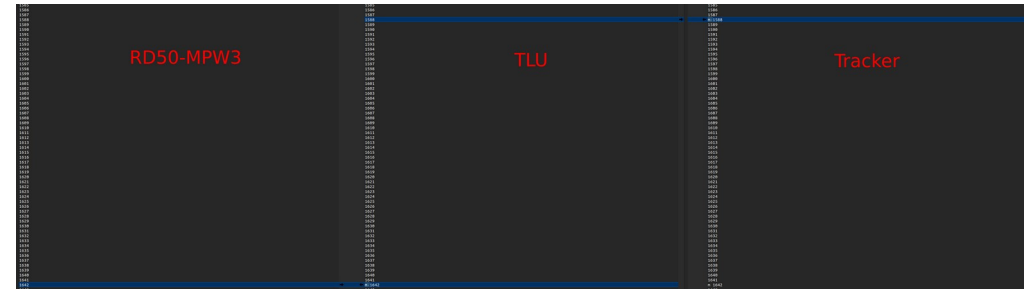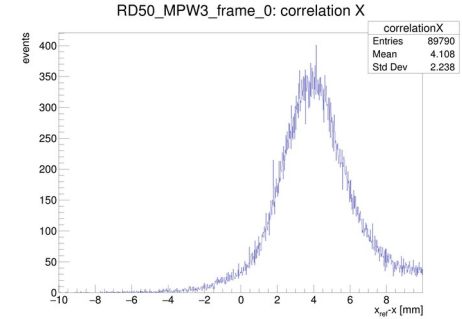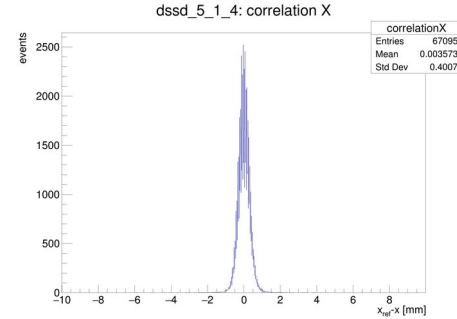
TJ-Monopix2 + RD50-MPW3

- Rather large EUDAQ setup operated on 3 PCs
  - 3 datacollectors, 4 producers, 2 monitors
- Did run stable (besides minor networking issues)
- Startup takes ~20s
  - TLU slow during initialization
  - MPW3 slow during config
  - TJ-Monopix2 slow during starting
  - Could be a problem with EUDAQ-scans (timeout → reset)
- Can be operated in parallel → DESY (parasitic, main user) operation should be no problem
- PC infrastructure setup requires some thoughts
  - Where to run Corry? 1 DC computer → syncing to two „Analysis machines"?
- Joint meeting with Monopix2 TB-crew?

Energy Scans – Cluster Size

- As to be expected: Lower energy → Bigger cluster size
- Still small clusters due to high threshold

Energy Scans – ToT
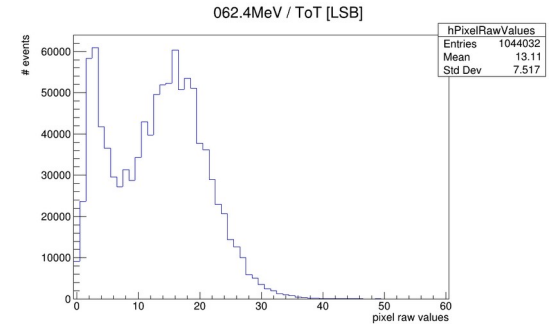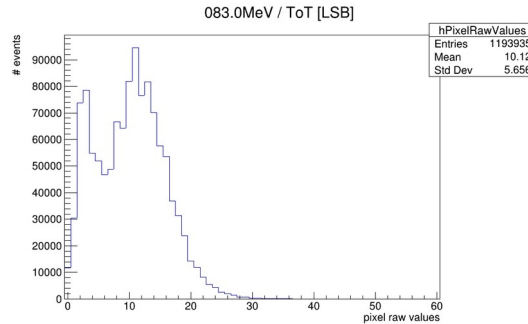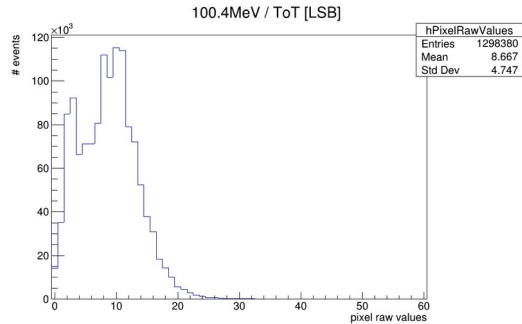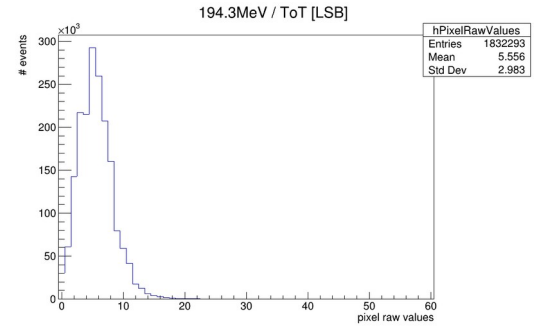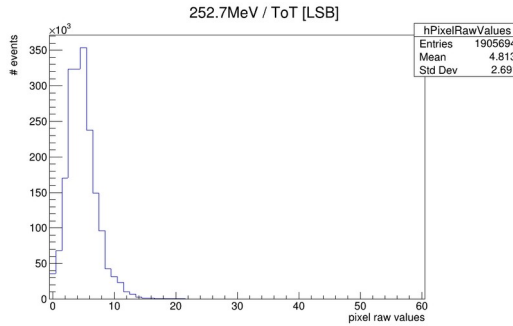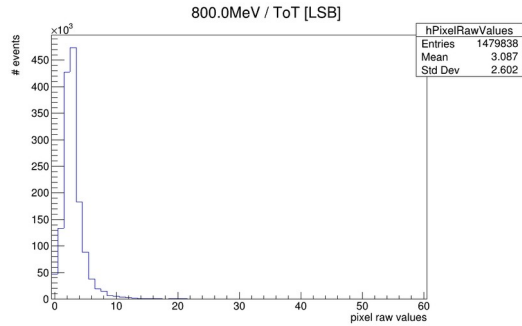
- Lower Energies → Bigger ToT
- At low energies ToT double peak observed

ToT double peak

- 1 pixel clusters responsible for main ToT peak

- "Secondary hit" pixel in 2 pixel cluster barely > threshold, most secondary hits not detected by comparator, those who „make it" show as low ToT peak

- Secondary peak appears at ~same ToT value

- Would really 2 distinct peaks show up and not just a broader ToT spectrum?
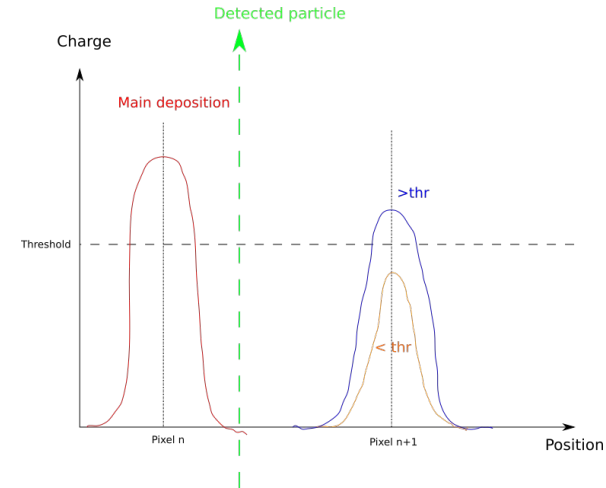
Energy Scans – Cluster Charge
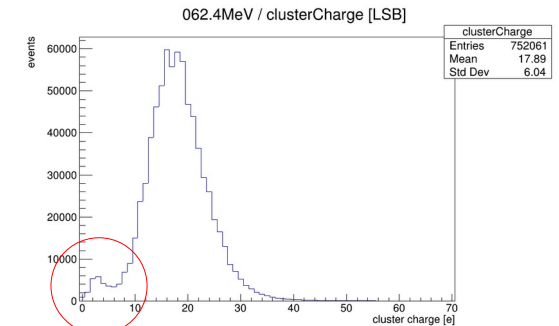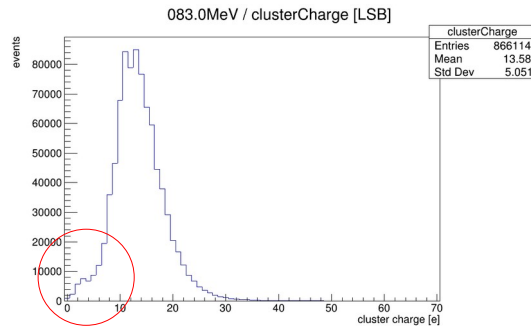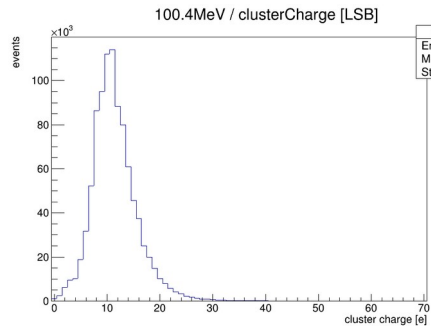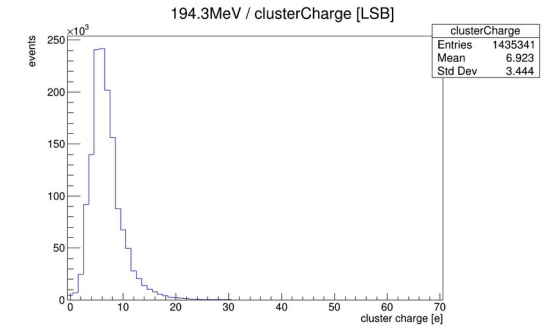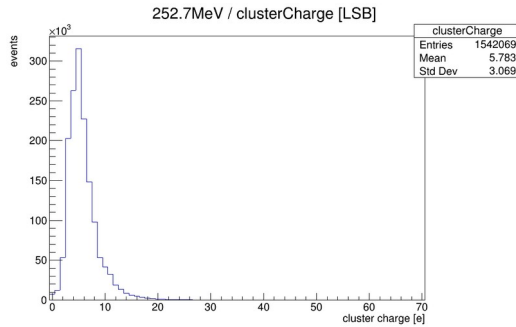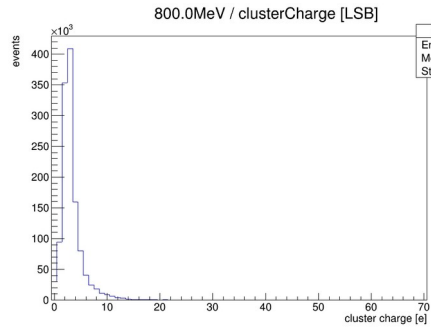
- Cluster charge shows integrated ToT value of full cluster
- Double peak mainly disappeared
- "Artifacts" still remain in 83 and 62MeV