

TB status, [2023-09-12 Di]

Straw TB team

September 12, 2023

Statistics of TB 23-August-H4: 5mm

w/o overpressure

HV	1410	1430	1450	1470	1480	1485	1500
Gain	25K	35K	45K	60K	??K	75K	90K
3.0mV/fC && 25ns, thr 5mV	7K	5.5K	67K	7K		11K	12K
0.5mV/fC && 200ns, thr 5mV			5K	0/3.2K	10K / 5.7K	10K	13K / 4.3K

+700mBar

HV	1700	1730	1760
Gain	25K	35K	45K
3.0mV/fC && 25ns, thr 5mV	9K	5K	11K
0.5mV/fC && 200ns, thr 5mV	6K	6K	9K

+1000 mBar

HV	1730	1795	1830	1865	1890	1965
Gain		18K	25K	35K	40K	75K
3.0mV/fC && 25ns, thr 5mV	10K	6K	6K	9K	3K	2.8K
0.5mV/fC && 200ns, thr 5mV		6K	6K	7K	1.5K	1.5K
0.5mV/fC && 200ns, thr 2mV						3.5K

Statistics of TB 23-August-H4: 10mm

w/o overpressure

HV	1715	1730	1750	1780	1790	1805	1820
Gain	25K	35K	45K	60K	??K	75K	90K
3.0mV/fC && 25ns, thr 5mV	7K	5.5K	67K	7K		11K	12K
0.5mV/fC && 200ns, thr 5mV	10K		5K	0 / 3.2K	0 / 5.7K	10K	13K / 4.3K

+700mBar, 1965V

HV	1965
Gain	
3.0mV/fC && 25ns, thr 5mV	5K
0.5mV/fC && 200ns, thr 5mV	5K

Thr scan (45K gain):

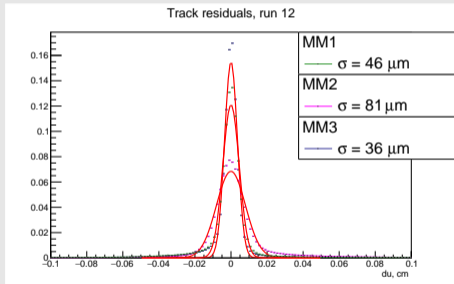
- Tiger & Mu2E thresholds: 2, 3, 4, 5, 7, 9, 10, 12, 15 – per $\sim 3\text{-}5\text{K} / 100\mu\text{m}$ bin
- Tiger thresholds: 5, 7, 10, 12 – per $\sim 5\text{K}/100\mu\text{m}$ bin

Tiger ToT:

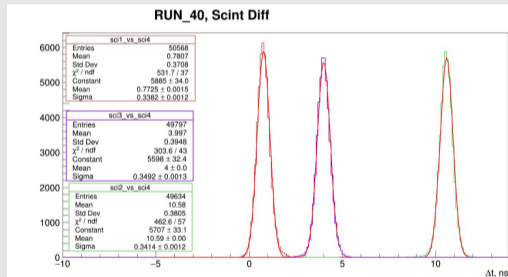
- 5K / 100um bin

Residuals & scint difference:

MM residuals

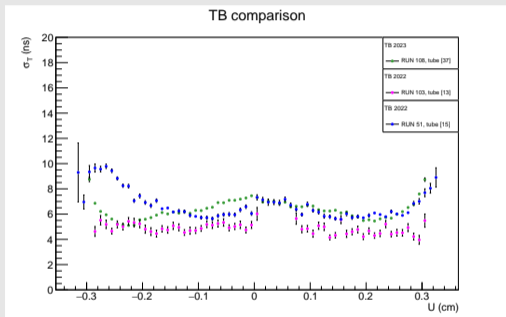


Scint difference

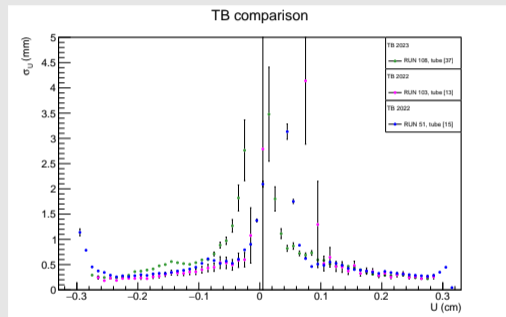


Problem 1: resolution comparison – 6mm (NA64)

Time resolution



Coordinate resolution

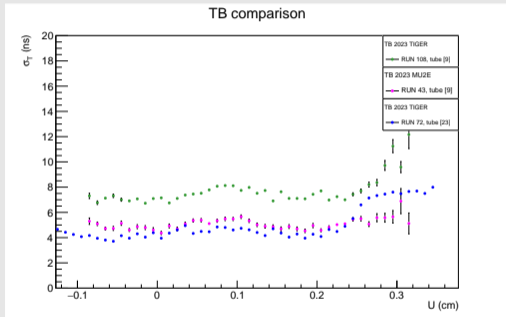


- Magenta – TB-22-July-H4-103, APV+Mu2E#1, camera #6
- Blue – TB-22-October-H4-51, Tiger, camera #6
- Green – TB-23-August-H4-108, Tiger+Mu2E#3, camera #2

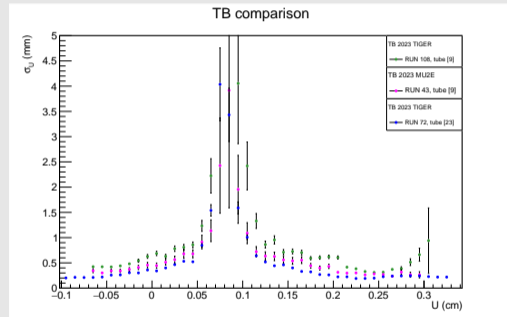
- ① Seems, we need to x-check clusterization parameters
- ② Need to compare with 23-April 6mm results

Problem 1: resolution comparison – 5mm

Time resolution



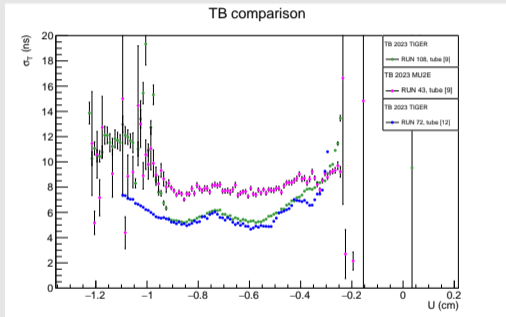
Coordinate resolution



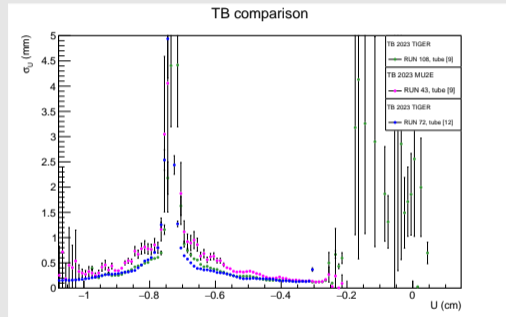
- Magenta – TB-23-August-H4-43, Tiger+Mu2E#3
- Green – TB-23-August-H4-108, Tiger
- Blue – TB-23-April-H4-72, Tiger

Problem 1: resolution comparison – 10mm

Time resolution



Coordinate resolution



- Magenta – TB-23-August-H4-43, Tiger+Mu2E#3
- Green – TB-23-August-H4-108, Tiger
- Blue – TB-23-April-H4-72, Tiger

Problem 1: resolution comparison – 20mm

For 20 mm TB-23-May-H8-5 will be compared with TB-23-August-H4-43 later.

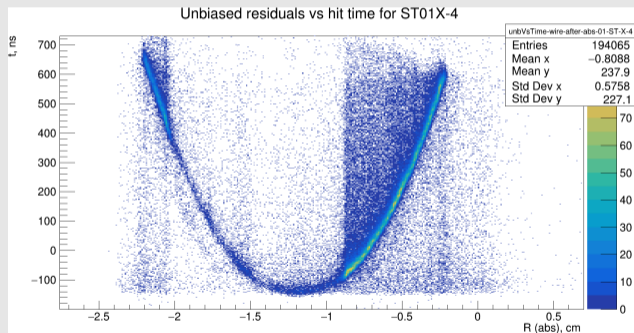
- TB-23-May-H8-5 – resolution about 100
- TB-23-August-H4-43 – resolution about ?? (need more statistics)

Problem 2: bad behaviour of FEBs:

Current FEBs:

- FEB A – Good
- FEB B – Burned-out channels, odd tiger does not work
- FEB C – Odd tiger does not work
- FEB D – Good
- FEB E – Efficiency of even tiger greatly less than normal
- FEB F – New, Maybe half-worked (not tested properly)

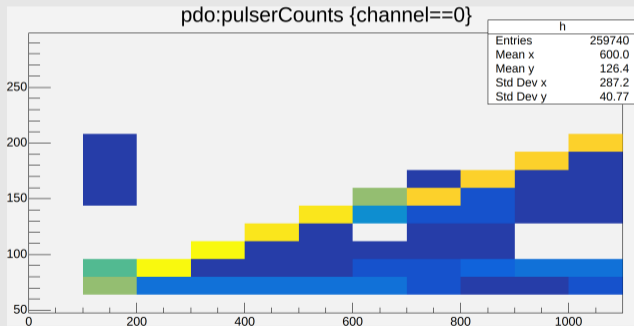
Feb E efficiency example



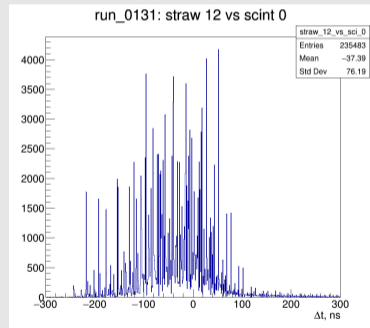
Problem 3: Mu2E Calibration

For 0.5mV/fC we need external calibration system

PDO range for internal VMM pulsers on gain 0.5mV/fC

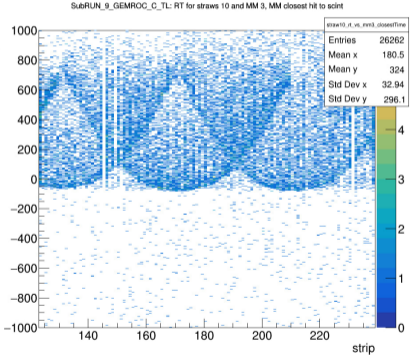


Results with current calibrations



Problem 4: "Bucket" on 20mm straws on TIGER

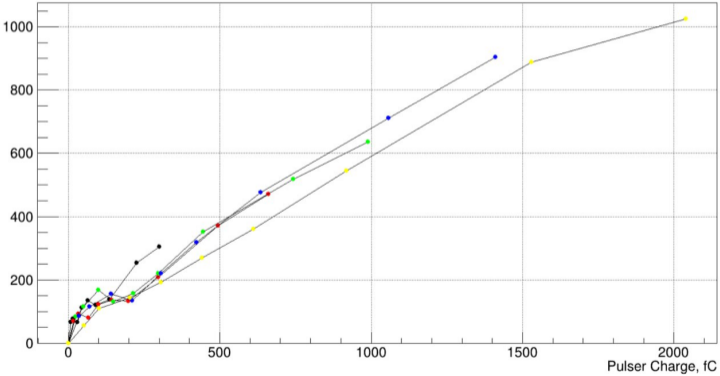
Not checked Vitalii's proposal



Problem 5: Tiger ToT behaviour

What do we have ?

TIGER Calibrations



Problem 6: merging problem

Technical: need to check merging for all data in 2023 TB

Proposal: stable TB naming

UPD

Added beamline to the TB name

Since we started to mix up the dates, when which runs was taken I propose to start using constant TB-independent run numeration on presentations:

Proposed format: TB- $\{YY\}$ - $\{Month\}$ - $\{Beamline\}$ - $\{RUN\}$.

Monthes are connected with EOS folder names.

For example:

- TB-22-April-H4-825 – run num from VMM number
- TB-22-July-H4-825 – run num from VMM number
- TB-22-October-H4-5 – run num from TIGER run number
- TB-22-November-H8-5 – run num from TIGER run number
- TB-23-April-H4-72 – run num from TIGER run number
- TB-23-May-H8-5 – run num from TIGER run number
- TB-23-July-H4-39 – run num from TIGER run number
- TB-23-August-H4-108 – run num from TIGER run number