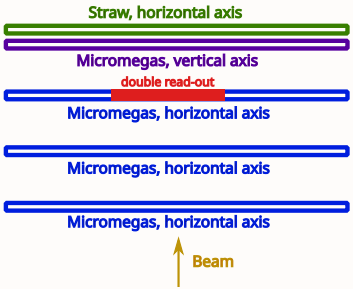
July 2022 testbeam setup

Straw TB team

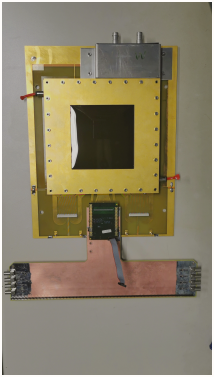
July 27, 2022

April-June TestBeam



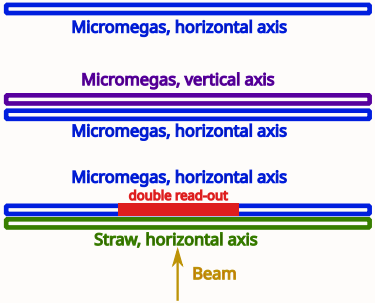
Setup during April-June TestBeam

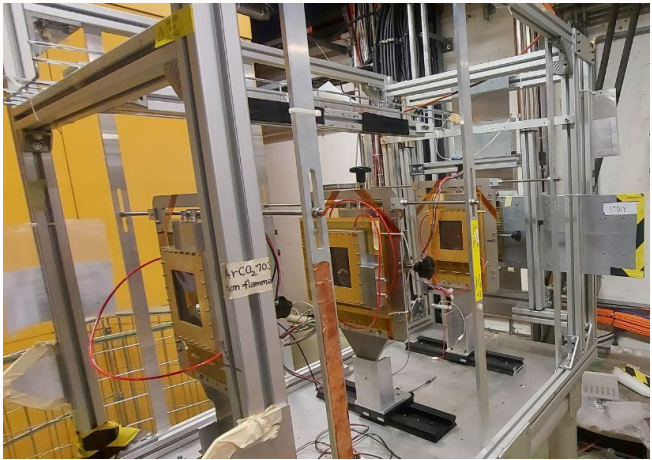
- Readout 1:
  - Straw with VMM3-based Mu2E
  - DAQ: VERSO
- Readout 2:
  - MicroMegas with APV
  - DAQ: MMDAQ3
- Cross-board: MM Layer 2 passed to both, Mu2E and APV readout.



Setup

- Straw, horizontal, axis
- 3 MicroMegas, horizontal axis (only central region)
- 1 MicroMegas, vertical axis
- Cross-board: 56 channels from MM, 8 channels for straws and scintillators



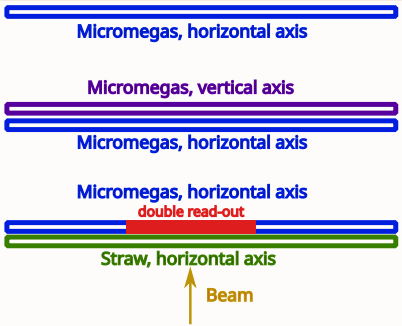


TestBeam goals

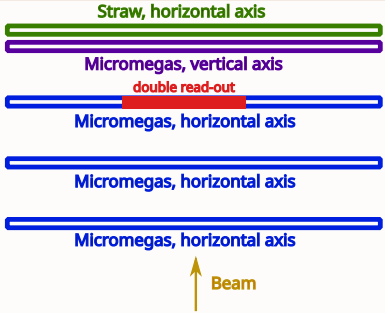
Goals

- "Cleaner" data
  (due to reduced distance between straw and MM)
- Take additional data with synchronization on Mu2E & APV
  ($\sim$ 800 GB)
- Test applicability of **Tiger ASIC**

July setup



April-June setup



Tiger status

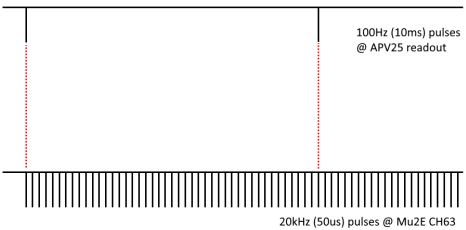
Tiger status

- Received Tiger chips
- Received Tiger-to-MicroMegas cross-board
- Produced double readout cross-board
- Installation of Tiger readout system in progress

Thank you for attention!

Backup slides

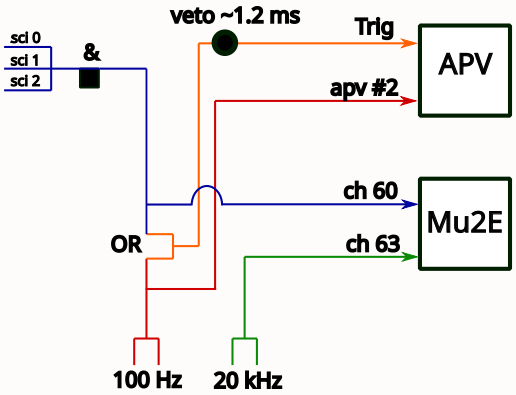
Reminder: synchronization method



Synchronization method

- Using two-channel pulser generator
- Sending two signals with different frequences and constant ratio between them.
- For Mu2E:
  - Fine timing based on 12-bit BCID count (each BCID – 25 ns, full cycle – 102 μs)
  - Pulser frequence selected to have two pulser signal in one cycle – 20 kHz
  - Estimated pulser period in 25ns counter: 2000 counts
- For APV:
  - We have trigger veto $\sim$ 1.2 ms ($\sim$ 1.0 ms) for April-June (July) TB
  - Pulser frequence selected to be 200 times lower then for Mu2e – 100 Hz
  - Estimated pulser period in 25ns counter: 400000 counts

Reminder: signal scheme



Signal scheme description

- Mu2E:
  - Triple scintillator coinsidence passed to channel 60
  - 20 *kHz* pulser signal passed to channel 63
- APV:
  - *OR* of the:
    - ★ Triple scintillator coinsidence
    - ★ 100 *Hz* pulser signal

    passed as a APV trigger with veto $\sim$ 1.2 *ms* ($\sim$ 1.0 *ms*) for April-June (July) TB
  - 100 *Hz* pulser signal passed to the APV #2 (used only for pulser signal)