

Test Beam for the Resistive High Granularity Micromegas (RHUM)

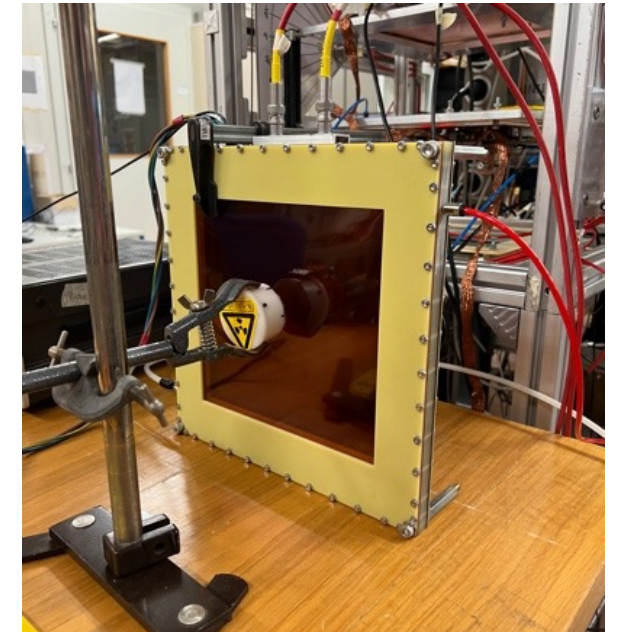
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RD51 Coll Meeting - June 20th, 2023

Focus of the next Test-Beam Campaign

1/2

- Test/Performance studies of the **TWO LARGE SIZE** small pad Micromegas (one was partially tested last year, the second was never tested at TB)
- Focus on Timing, now also exploiting a scintillator trigger time measurement via APV (to drastically reduce the 25 ns time jitter of the APV for asynchronous signals)
- Time resolution studies also from two standard small-pad MM with **REDUCED DRIFT GAP (3mm)** → should reduce jitter for time at peak (or from APV signal fit)
- FAST gas mixture: Ar/CF₄/Isobutane 88/10/2
- Position Resolution studies Vs Cluster characteristics
- If available, high rates with pions

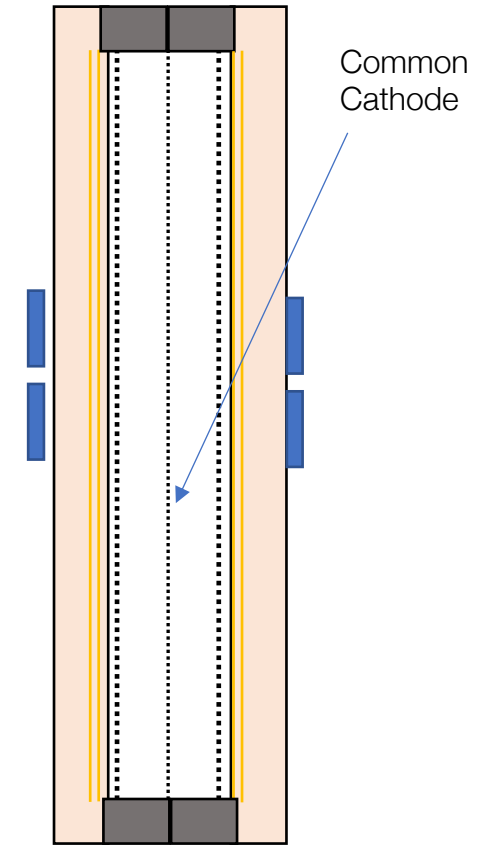


If time and person power allow, we plan to test in September:

- The two Large detectors coupled face to face with a common cathode → angular scan)
- Two brand new single foil DLC small-pad bulk MM, fully manufactured at ELTOS

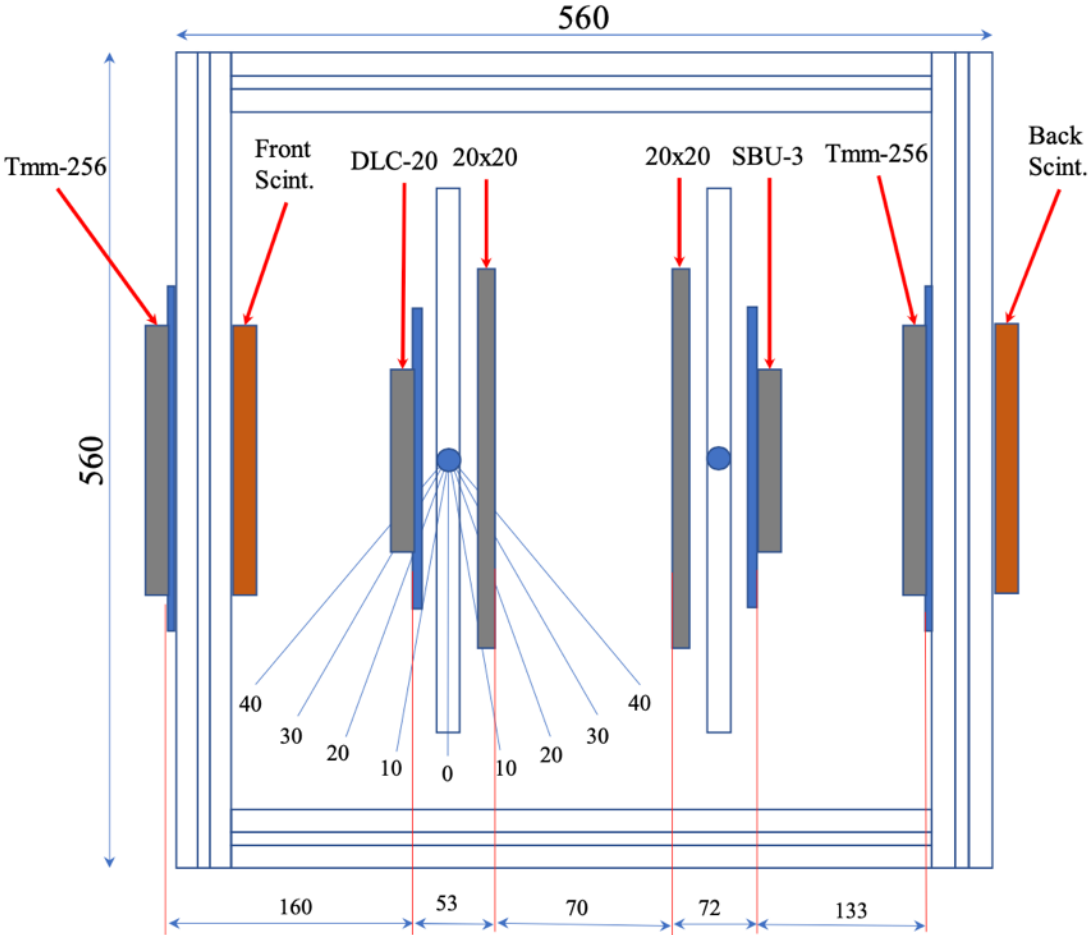
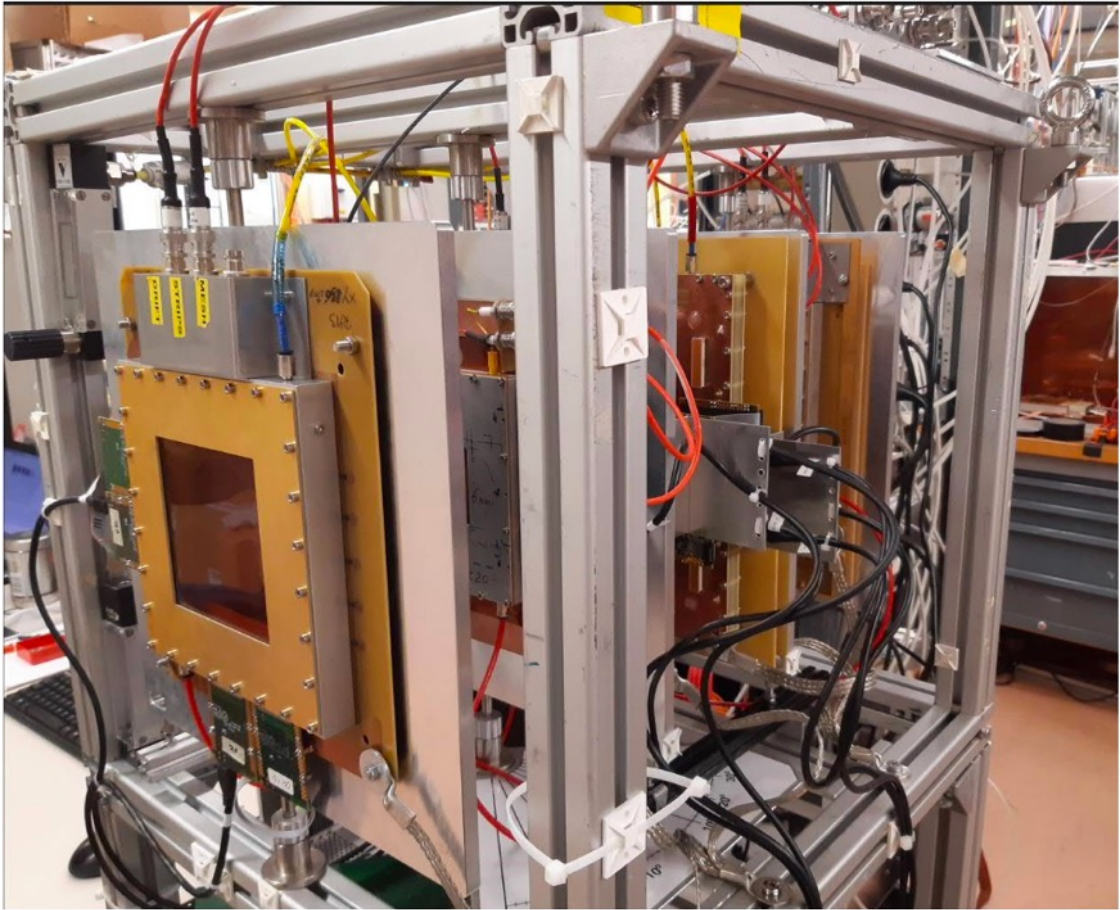
Aim to participate to the following TB periods:

- 5-12 July with possible extension to 19 July
- 30 August – 6 September
(if we have enough manpower)



The Setup is ready – in the GDD Lab

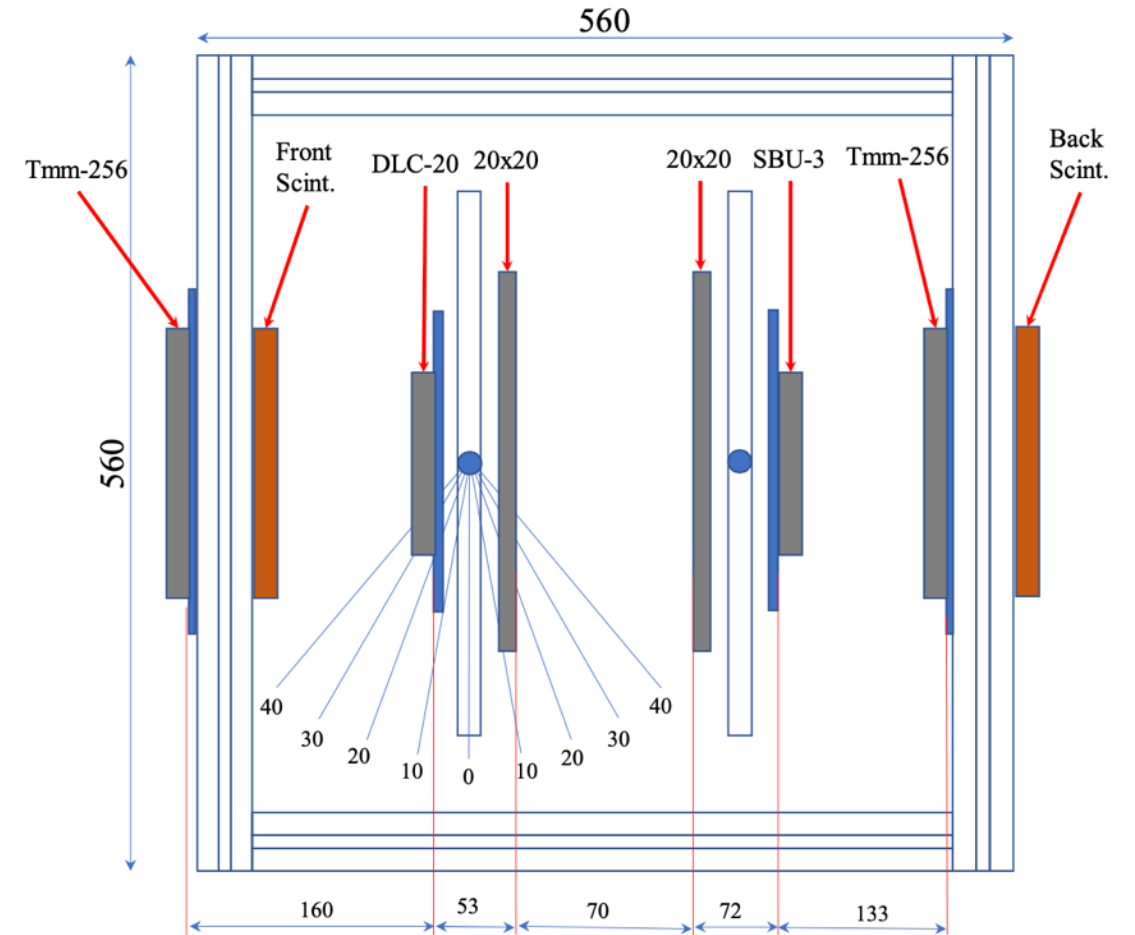
(thanks, Givi !!!)



Detector Setup

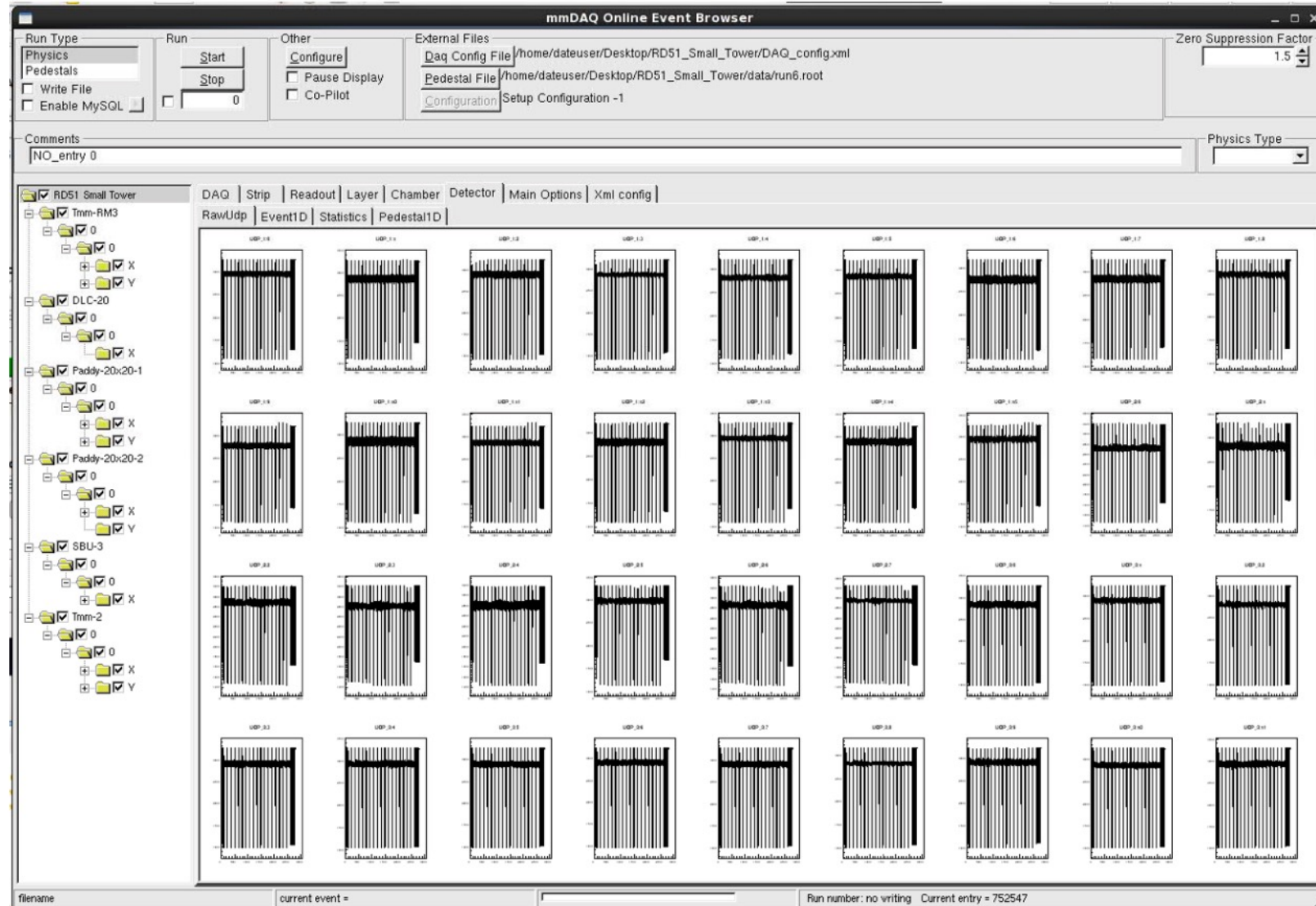
SETUP:

- Aluminum frame of about 50x50x60 cm³
- 2 scintillators for trigger
 - Trigger signal feed into APV
- 2 resistive XY strip MM for trackers
- 2 Small-Pad MM (3mm drift gap)
- 2 LARGE size Detector (Paddy's Big Brothers)
- FE Electronics and DAQ: APV25 + SRS



DAQ configuration is ready and up-and-running

3 FEC – 36 APVs

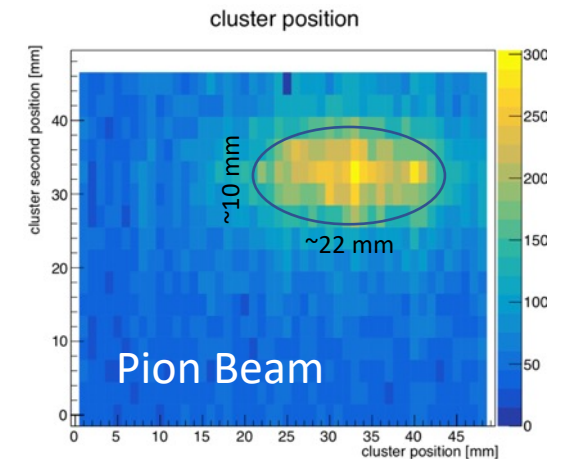
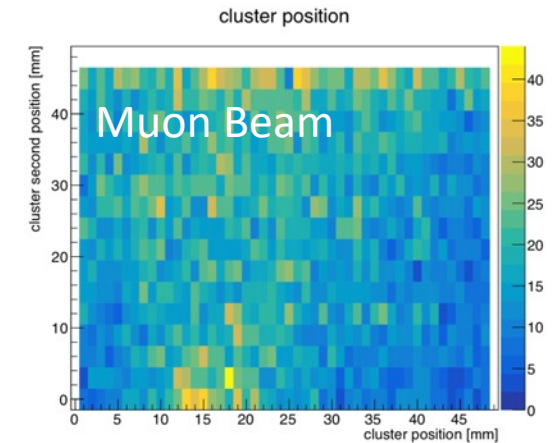


Infrastructure and Beam requests

- Standalone setup, including trigger
- No Magnetic Field
- Gas:
 - Ar/CF4/Iso : 88/10/2 (we have 2 bottles)
 - (Ar/CO2/Iso : 93/5/2 not sure yet if needed)

BEAM:

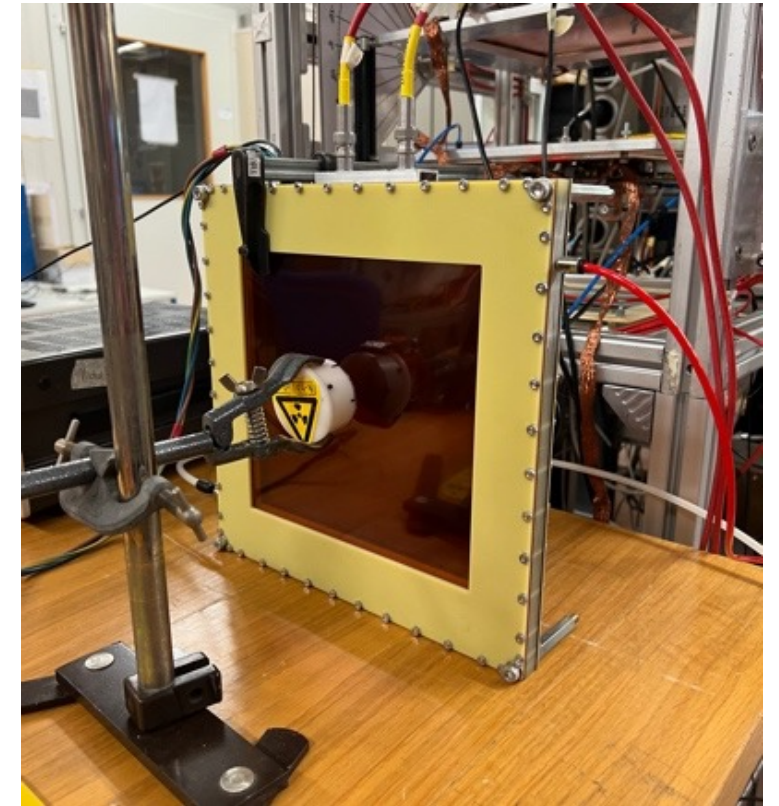
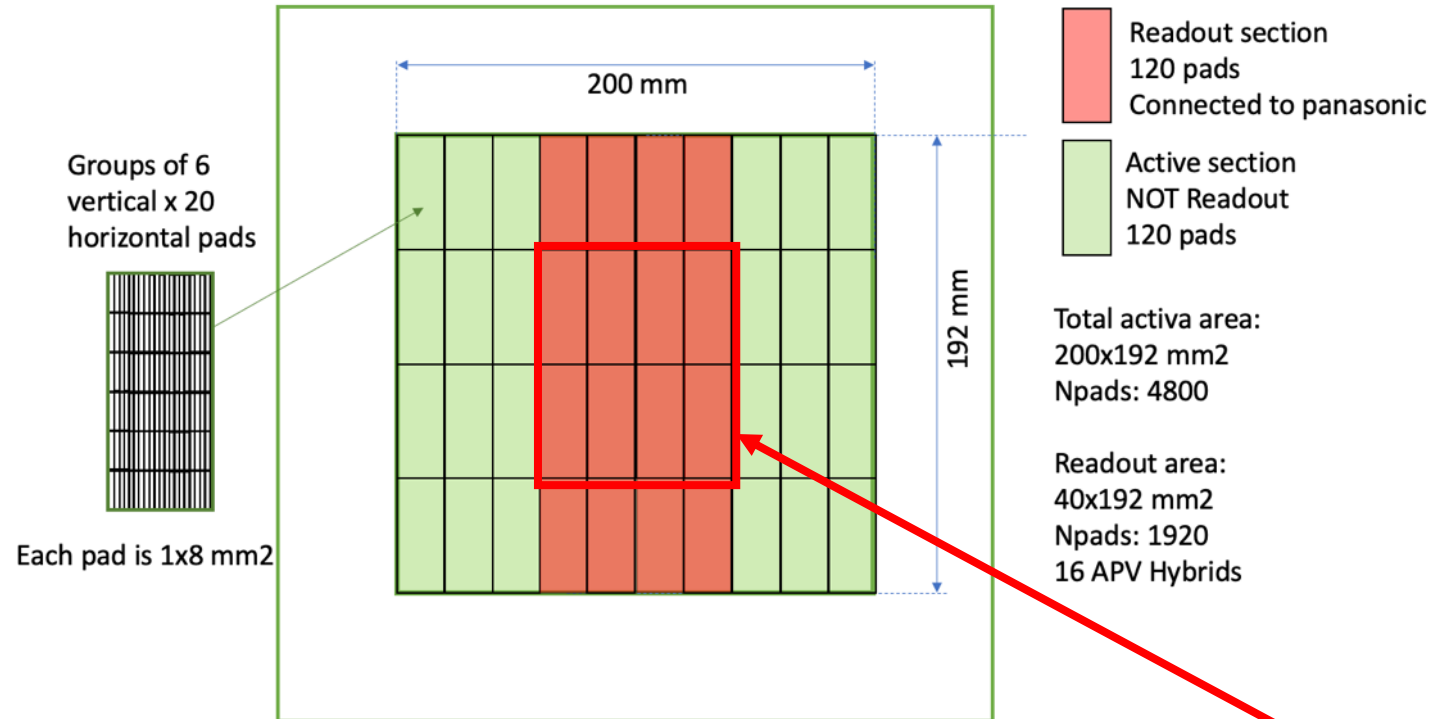
- Muon beam – large spot - “low rate” ~tens kHz
- Pion beam – small spot – high rates >1 MHz
- Usual available H4 Beam parameters (profile and scintillator counts)



BACKUP

PADDY400 – the Large-size detector

LAYOUT "20x20"



- Active area: 200x192 mm²
- Pad 1x8 mm² - Total Number of Pads: 4800
- Double layer DLC with grounding vias every 8 mm
- Panasonic connectors on the back of the Detector
- Partial readout: 1920 connected pads out of 4800 tot pads

Readout area in 2023:

- 80x80 mm² – 960 channels
- 8 APVs