Cosmic Bench Status

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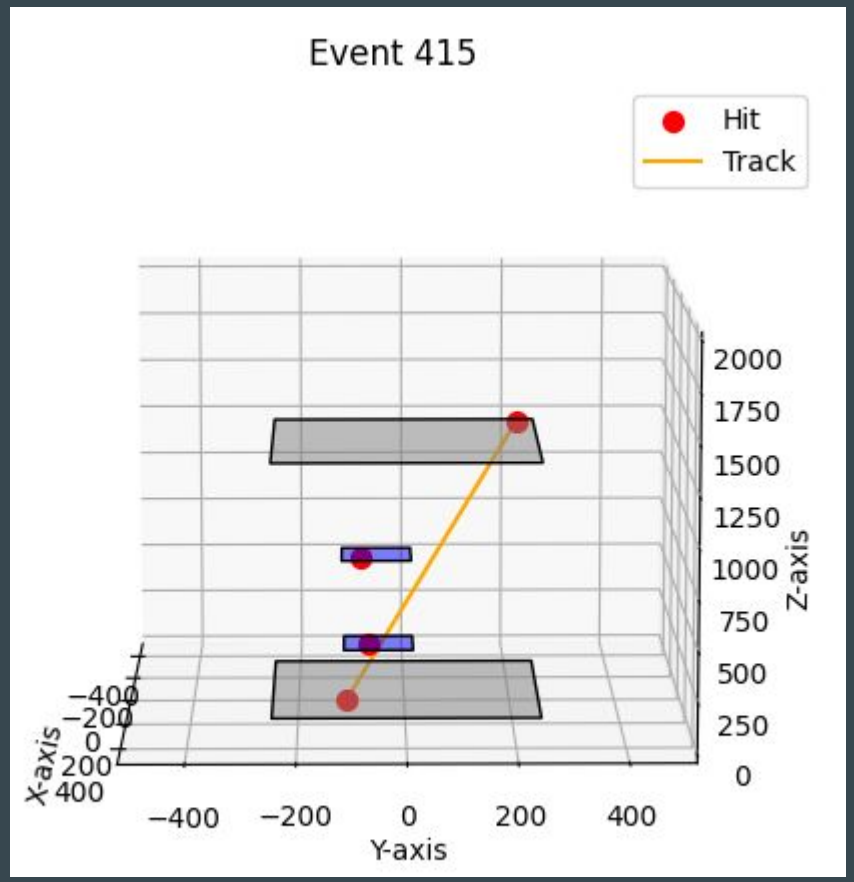
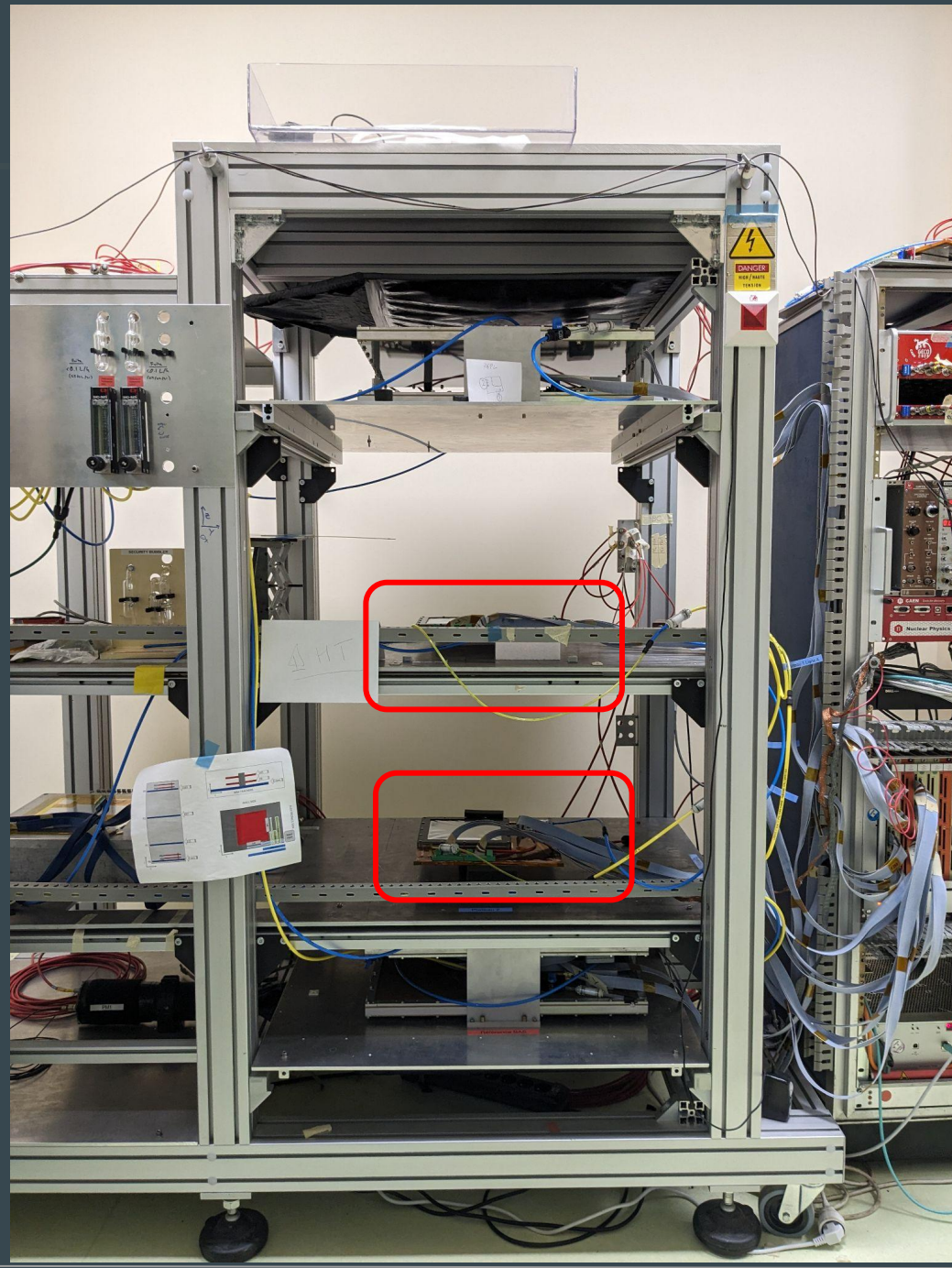
Cosmic Bench last Monday

Had trouble accurately measuring the positions of the detectors (personal failing, no practical limitation), but proof of life



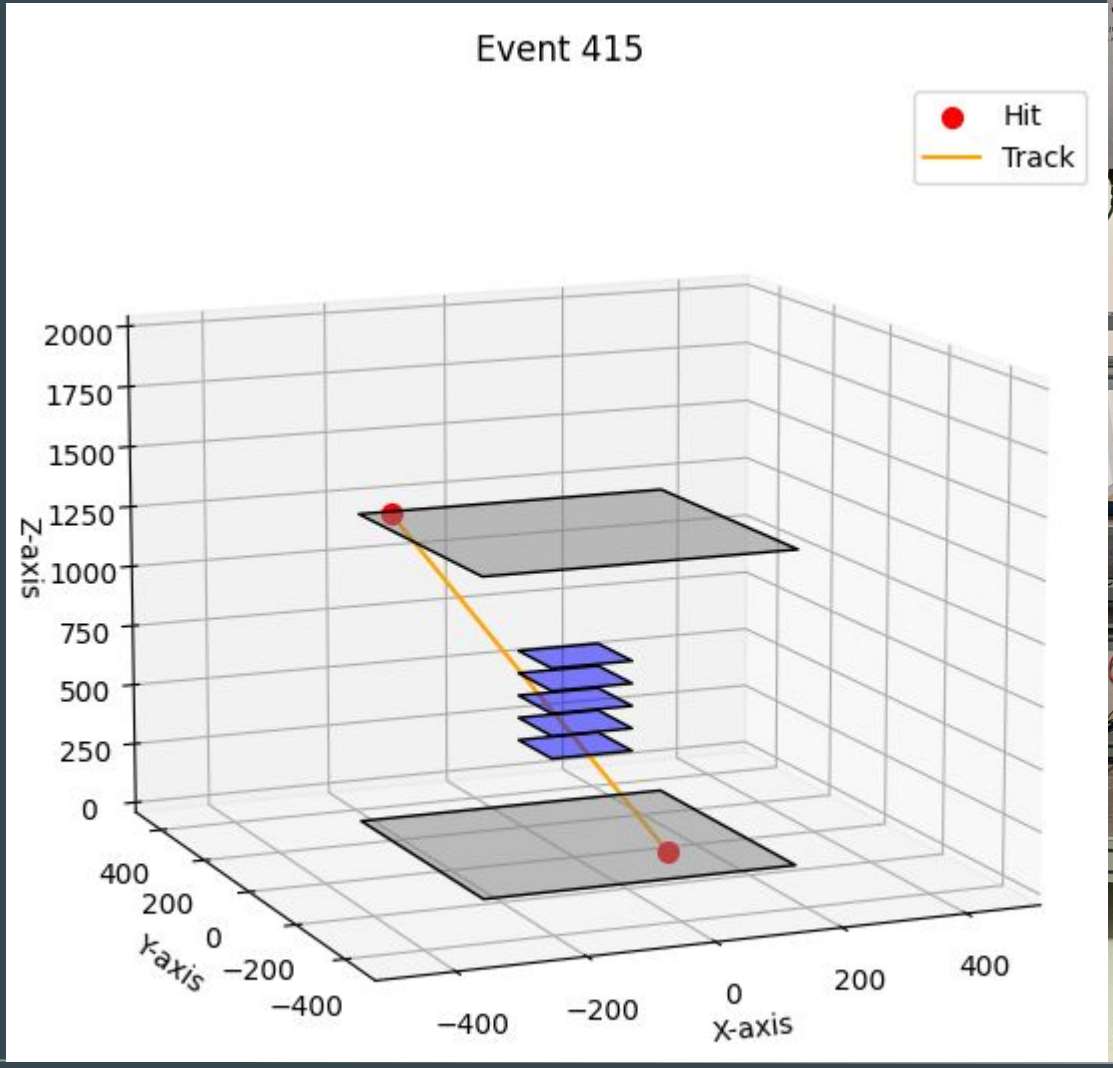


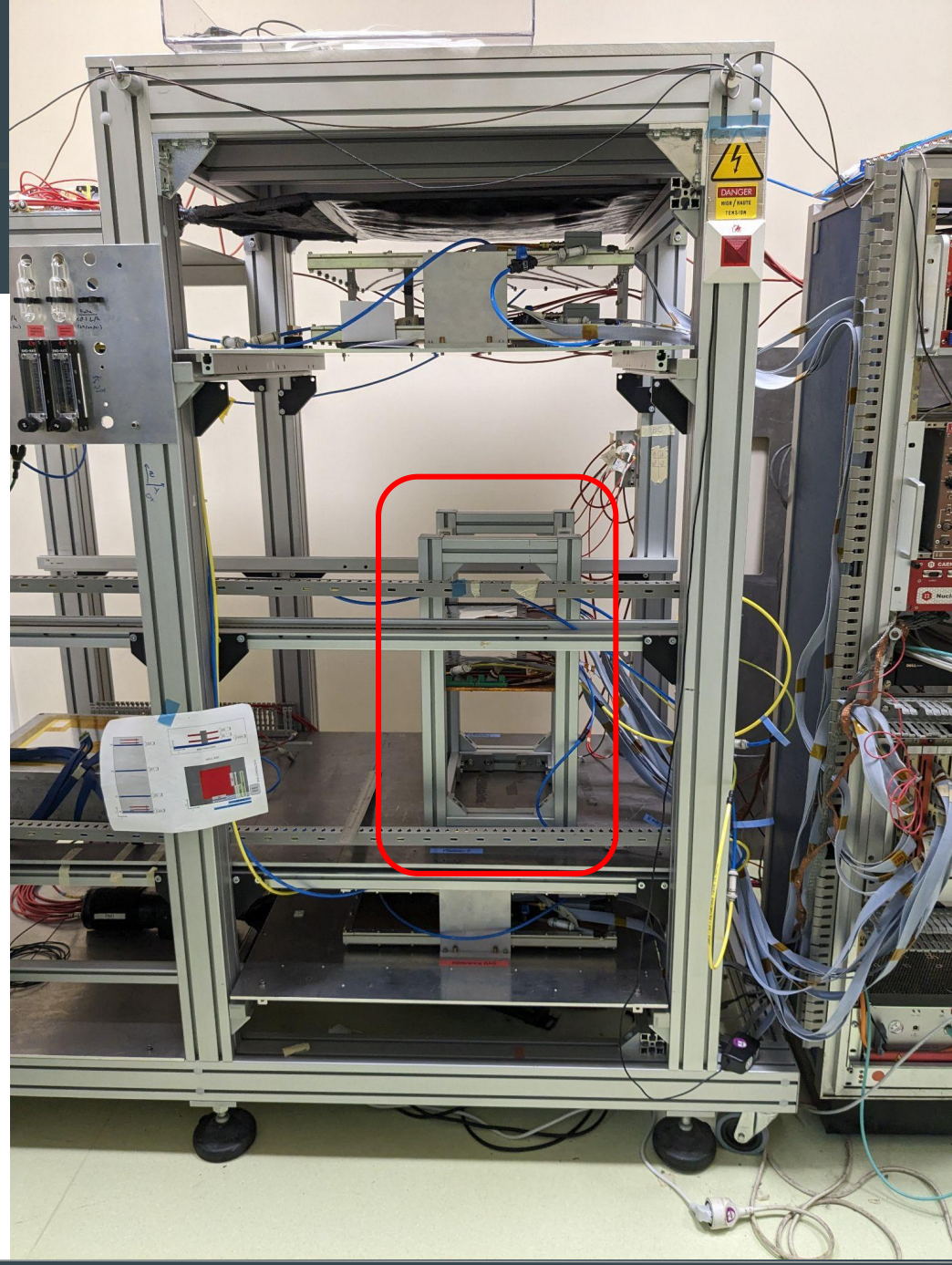
Cosmic Bench Last Tuesday

Cyril built/installed a stand for up to 5 boards!

I attempted to carefully align the active area of the boards in the stand with the center of the reference detectors' active areas.

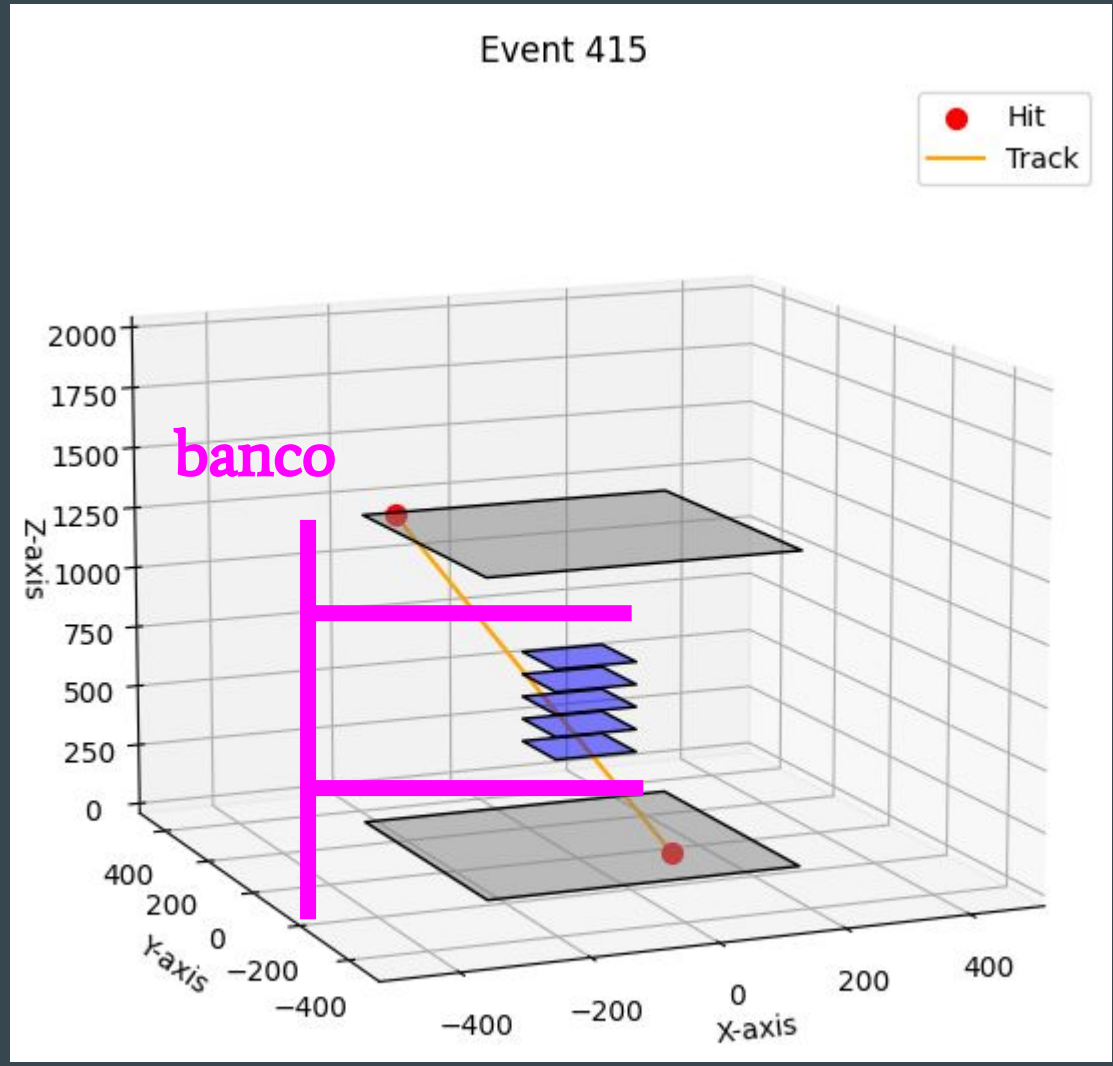
Hopefully more reliable geometry along with more detectors in parallel





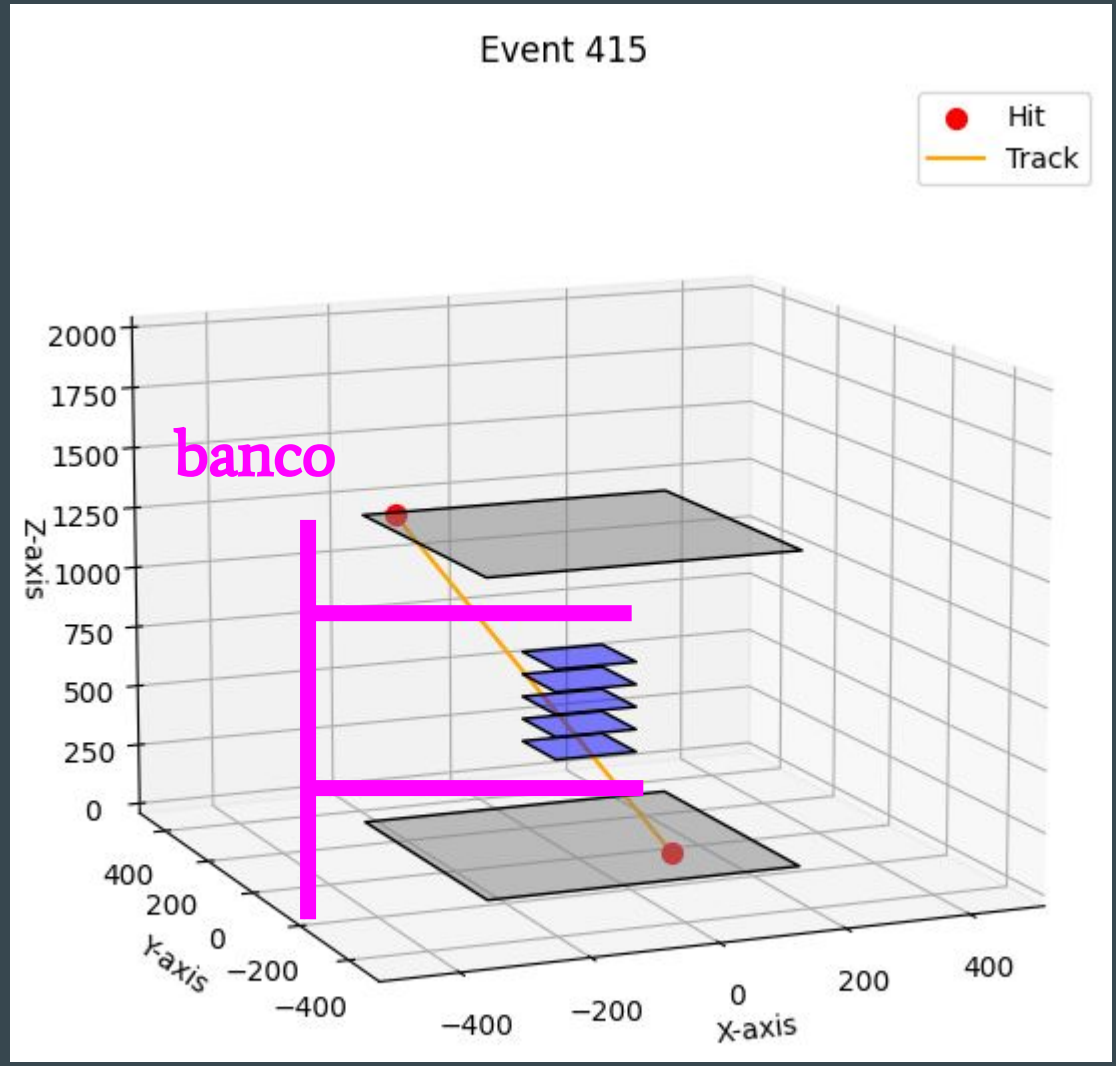
Addition of Banco

- Will add banco for additional tracking
- Some question of how to synchronize banco's independent data stream with the other detectors
  - I think a long enough inhibit circuit after each trigger should ensure the same number of triggers on banco and the other detectors



Alignment of Banco

- Samy suggests to align banco over important areas of the detectors.
- May have to reposition banco for each of the 5 detectors if these important areas don't align
  - Not the end of the world, can still continue to accrue statistics on others
- Francesco suggests not triggering on banco exclusively (would reduce rate by ~90%), but instead using 60x60cm scintillator trigger and splitting resulting dataset into with/without banco events



Rate Estimate

- For 60x60cm scintillators, get a rate of ~10Hz

- Active area of test boards about 13x13cm (?)
  - Naively assuming all tracks vertical, should get $13\text{x}13\text{cm}^2$ / $60\text{x}60\text{cm}^2 \cong 5\%$
    So a rate of about 0.5 Hz
    Expect about **40k / day hitting test detectors**
  - Banco active area 15x1.5cm (thank you Samy)
    So 1.5cm / 13cm = 11.5%
    Reduce to **4k / day hitting banco**
  - Don't want to trigger exclusively on banco with small scintillators
    Take all triggers from coincinent 60x60cm scintillators
    To reduce data

- **Will be using test data to first check actual rates and improve these estimates**

Disk Rate Estimate

- ~0.75 GB per hour per feu
  - 1 feu for reference detectors
  - 2 test detectors per feu
  - For 5 test detectors → 3 feus, 4 total
    - 3 GB/hr
    - Plus banco, no idea on that
      Say 5 GB/hr
  - Clas12 disk has ~500 GB free
    - 500 GB / 5 GB/hr = 100 hr
      ~ **3 days of space (No filter)**
- Only ~5% of triggers are expected to hit detectors (probably more hit at least one at angle, say 10%).
  - Could run filtering script on the fly to select only events with track passing through detector volume
  - →0.5 GB/hr
    → **30 days of space (Filter)**