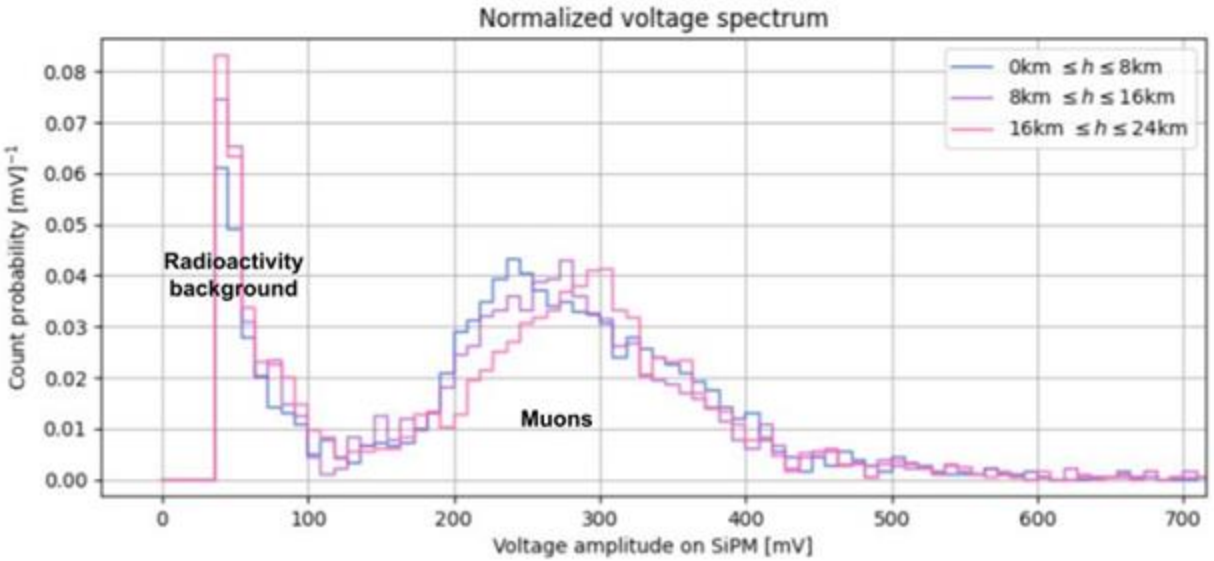
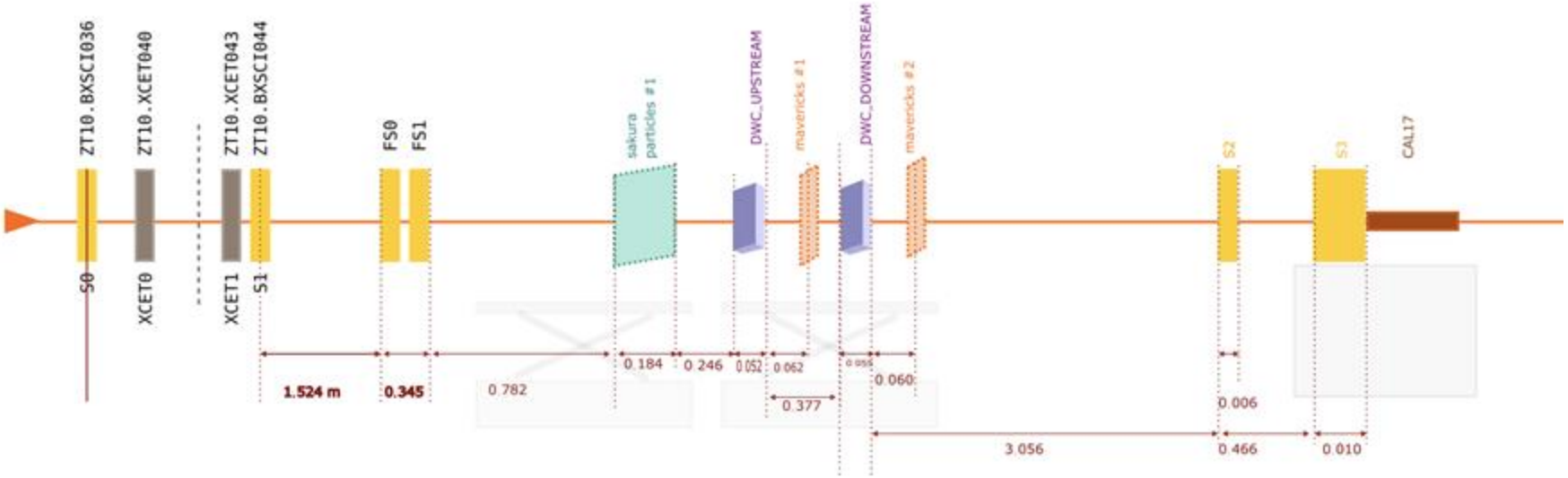
TEAM MAVERICKS

Reminder – what did we propose?

1) Balloonflight measuring the muons in the stratosphere produced surprising results
2) Our theory was that muons at different energies produce different voltages in the SiPM
3) Our experiment – in a controlled environment, calibrate or detector to differentiate between the muons at different energies



Set-up of our experiment



Cherenkovs used for tagging muons with certain momentum. Signal recorded in two of our detectors (scintillator & SiPM).

Birds-eye view of our time in T10

1) Calibrating everything
2) Fixing issues
3) Actual measurements and data analysis

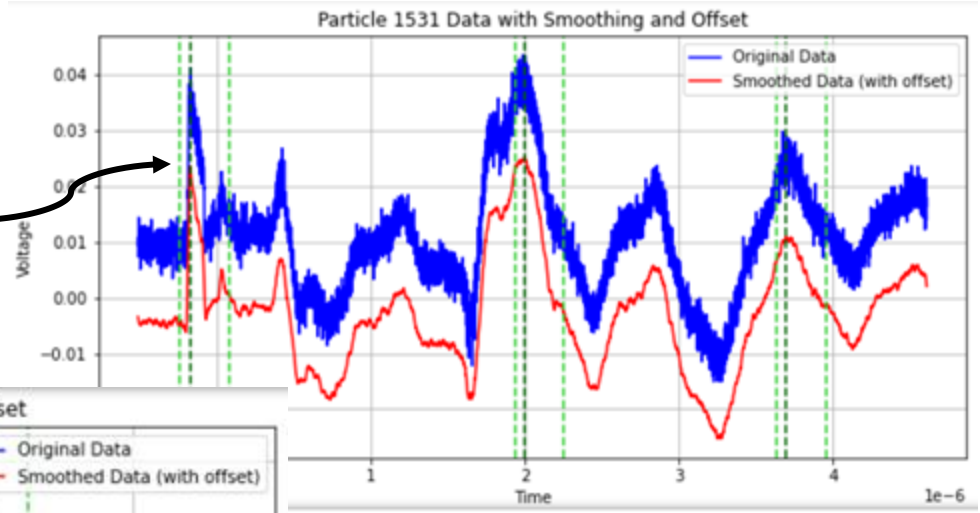
Overall, better speed then expected

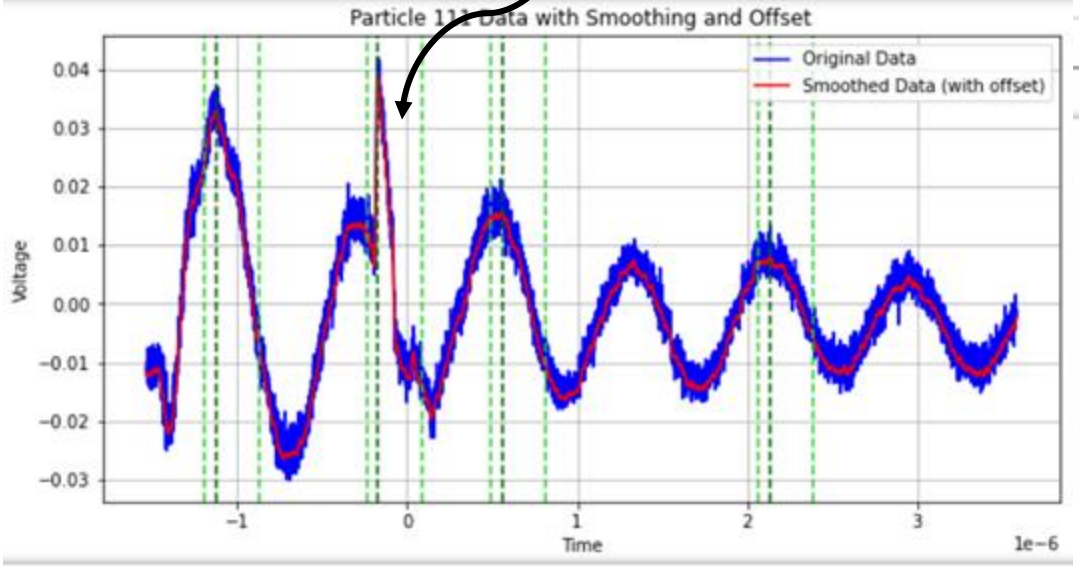
Challenges

- NIM modules breaking
- Part of the trigger (S0) having efficiency problems
- Cherenkovs fading away
- Board murdering SiPMs
- 4MHz

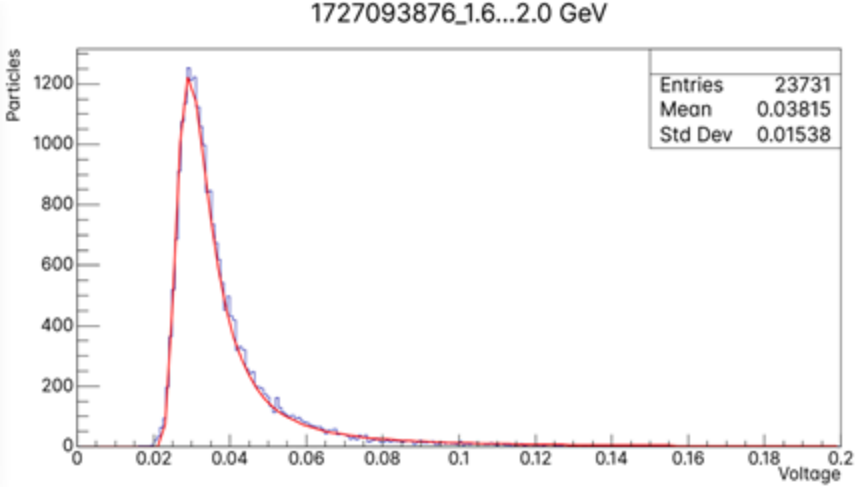
Mysterious 4MHz

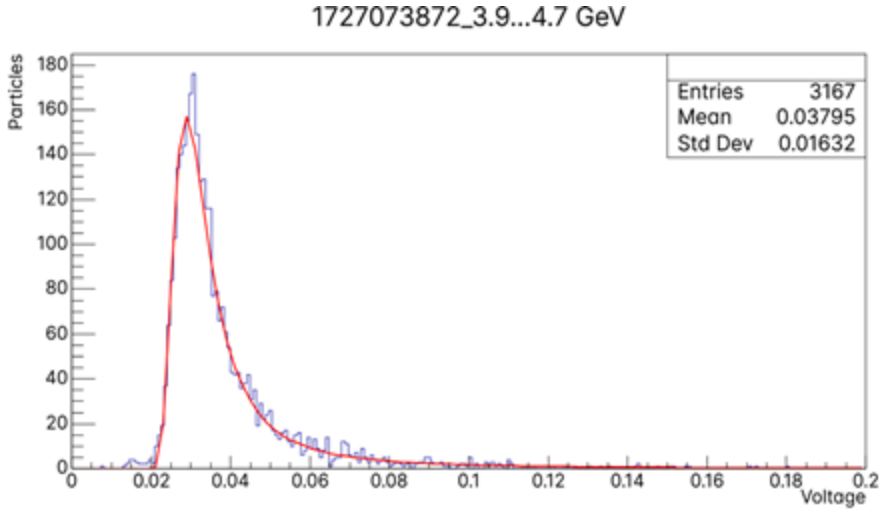
SiPM signal



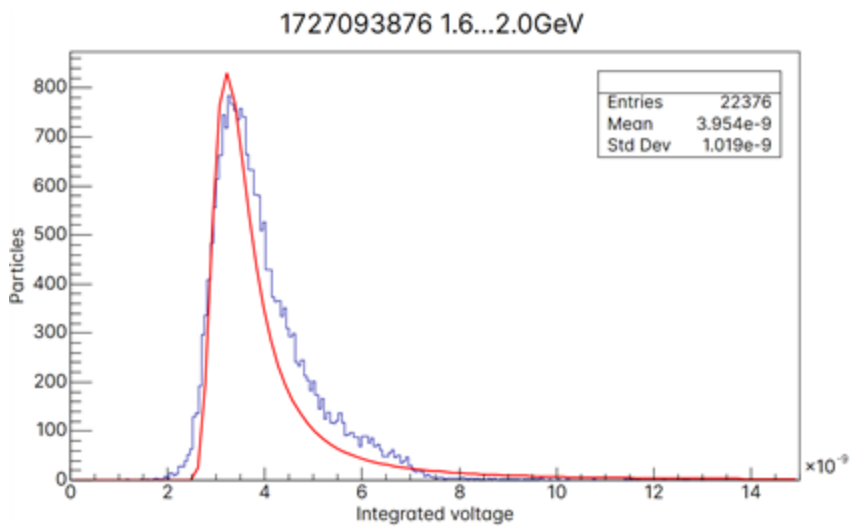


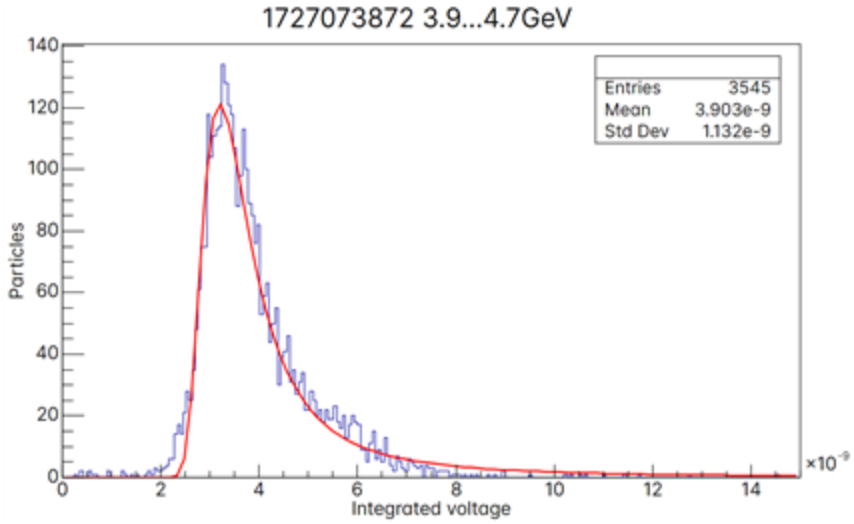
Our findings. Part 1 - SiPM peak voltages





Findings. Part 2 - Area under SiPM's signal

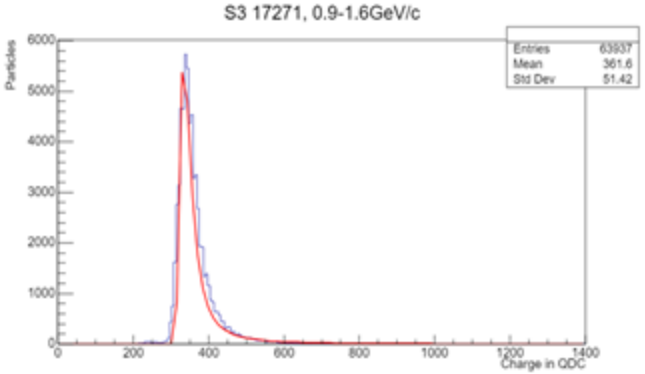


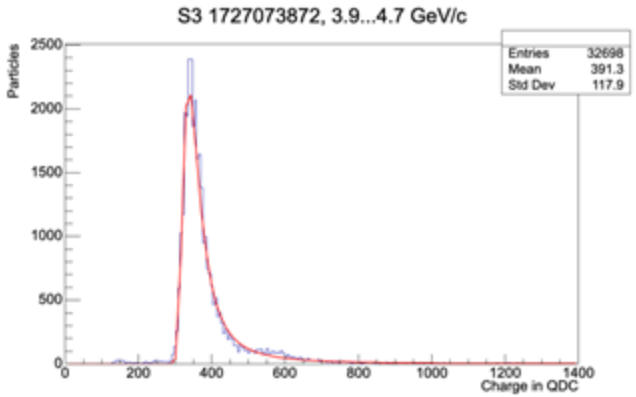


Last chance - other detectors

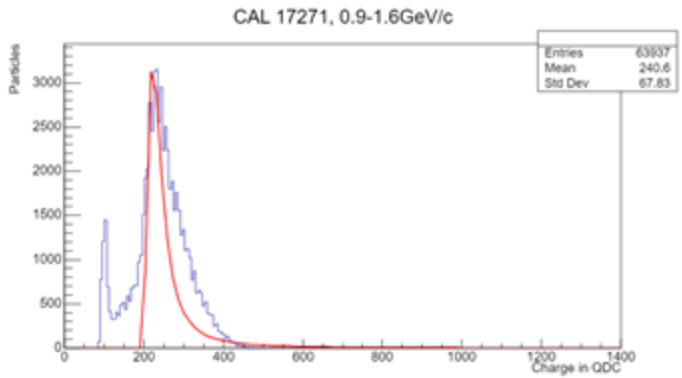
- No change
  - except higher max values
- Punchthrough noticeable for calorimeter

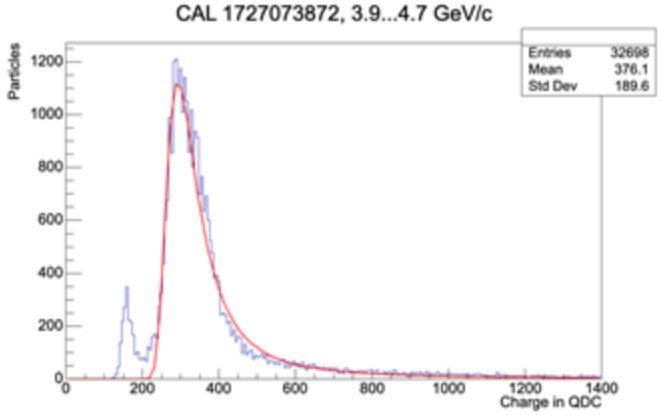
Thick scintillator



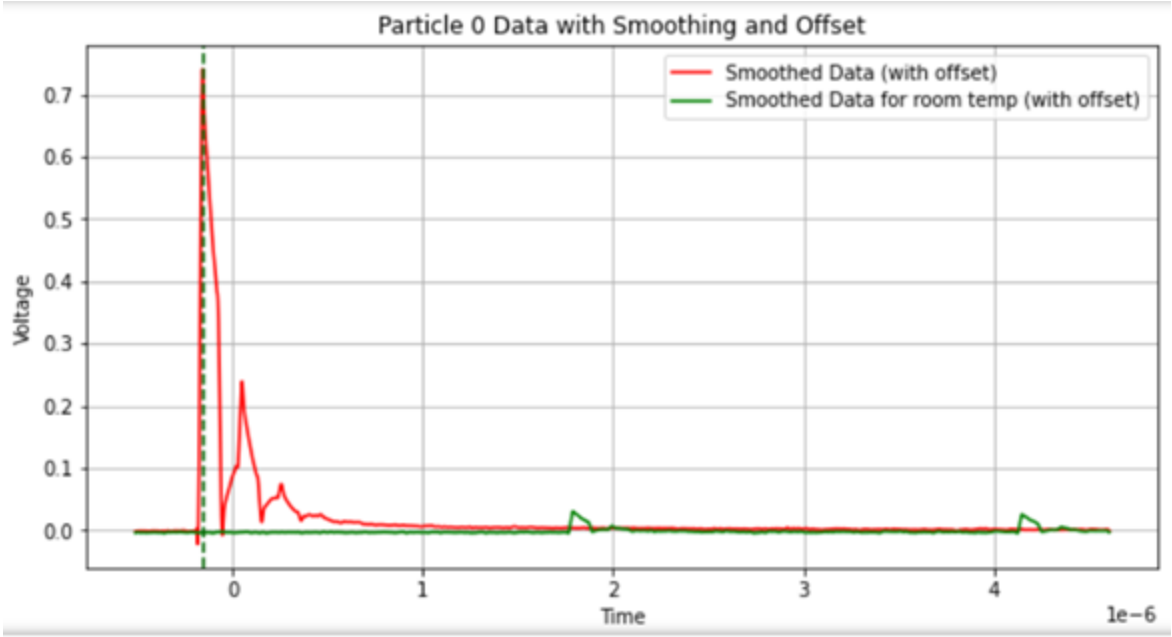


Calorimeter





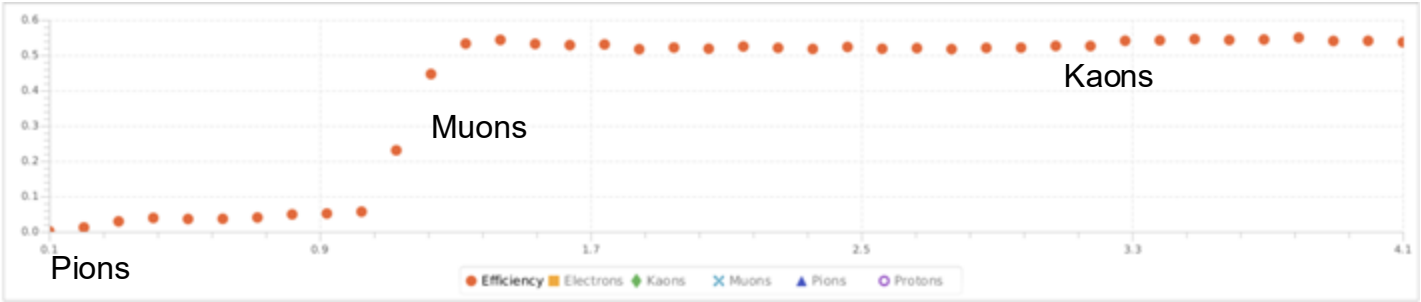
Temperature!



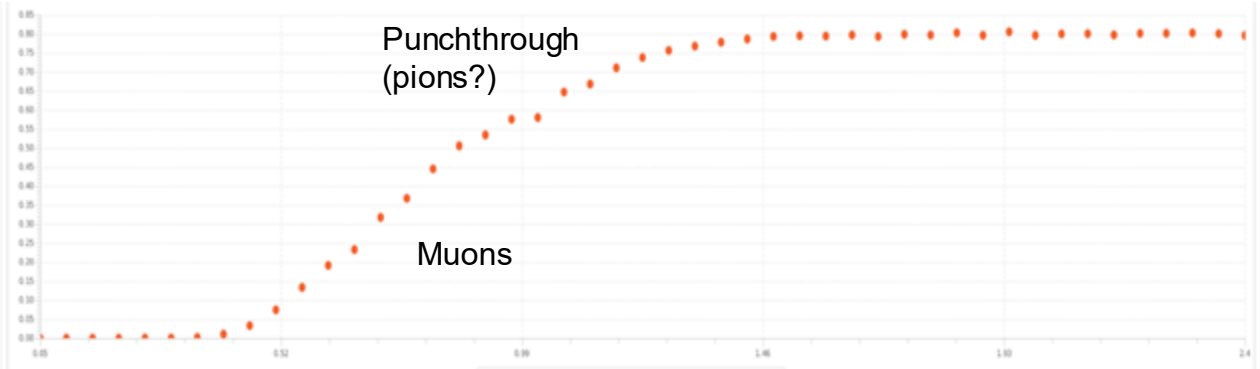
…what -90℃ does to a signal

Pressure scans

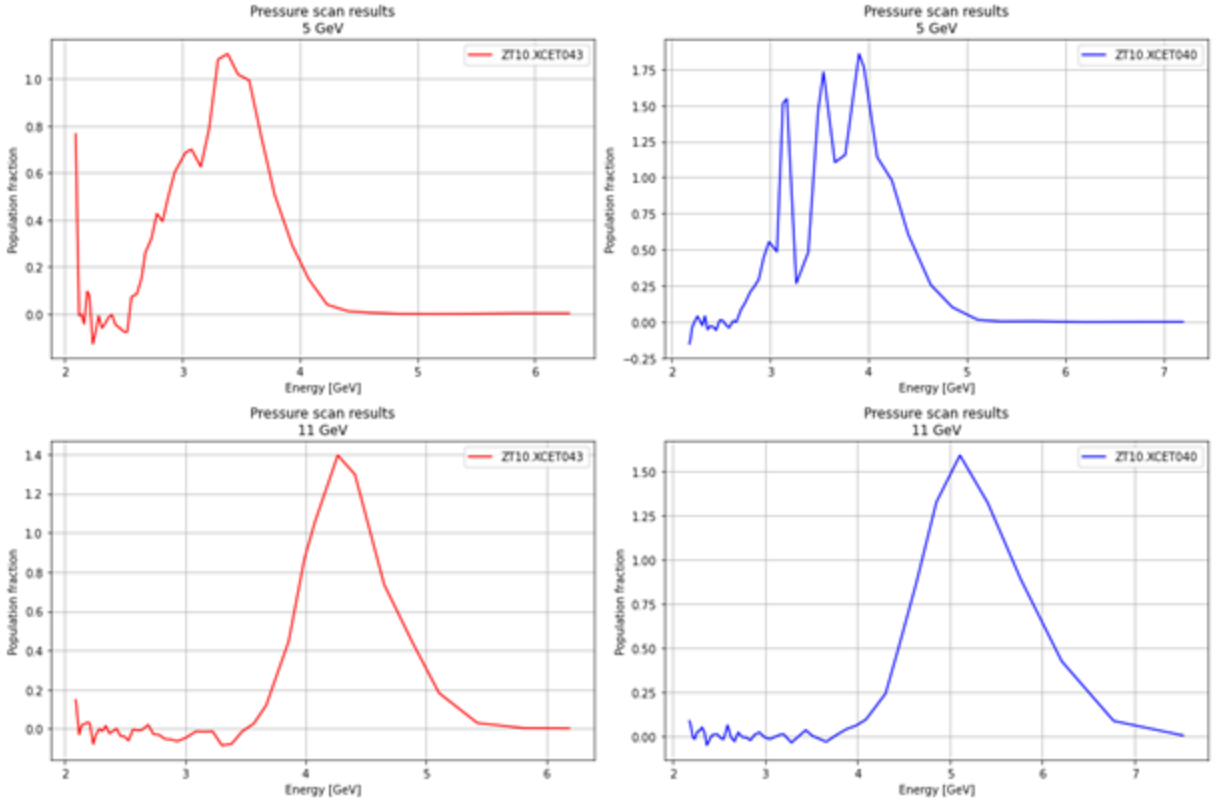
Hadron beam



Muon beam

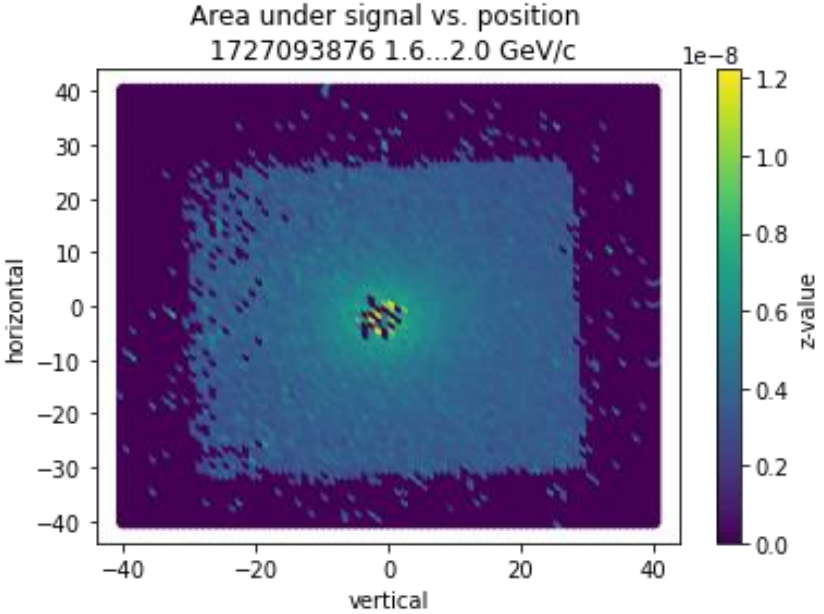


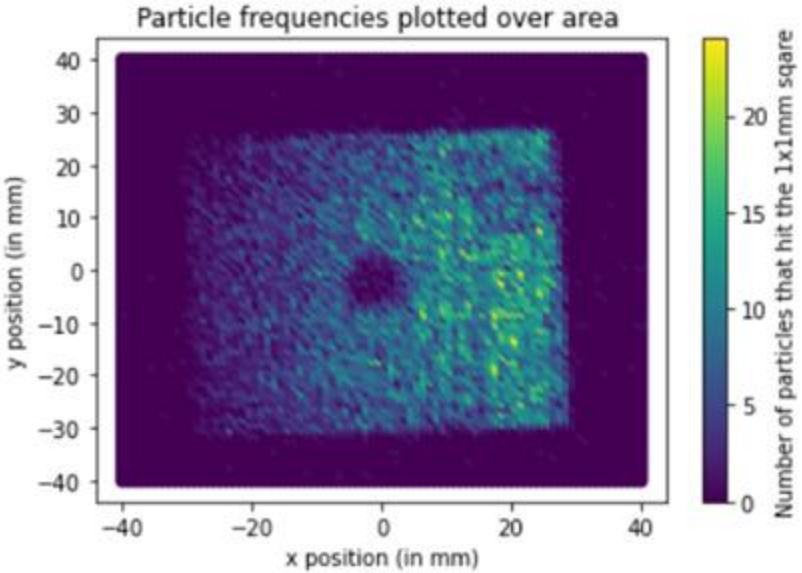
Pressure scan ⇒ Muon spectrum in T10



(accounted for Cherenkov's efficiency problems)

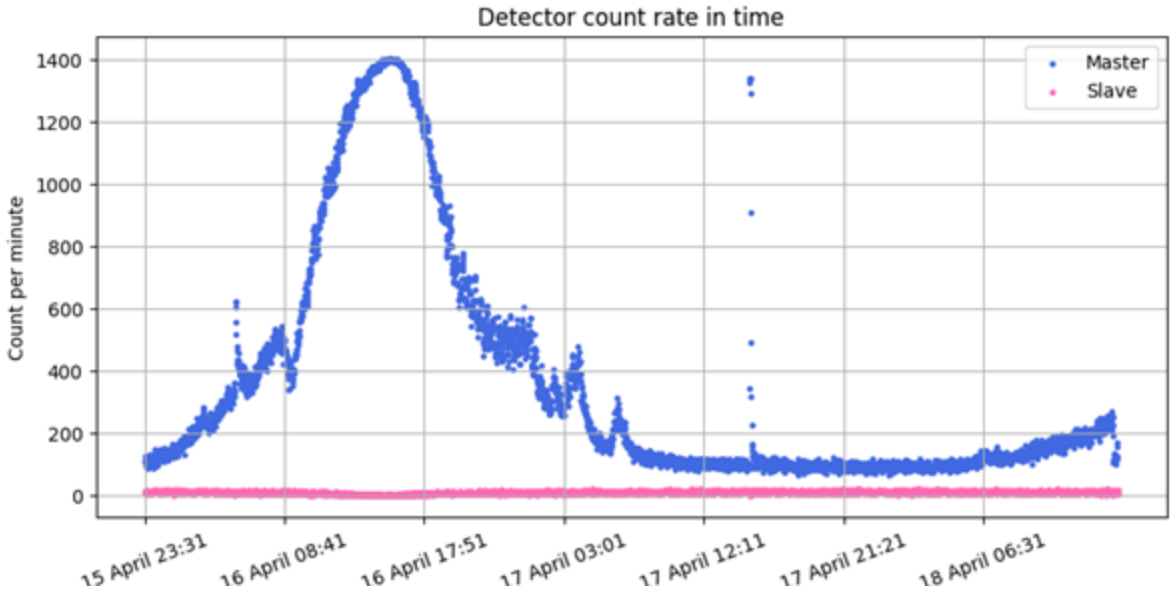
Accidental muon tomography

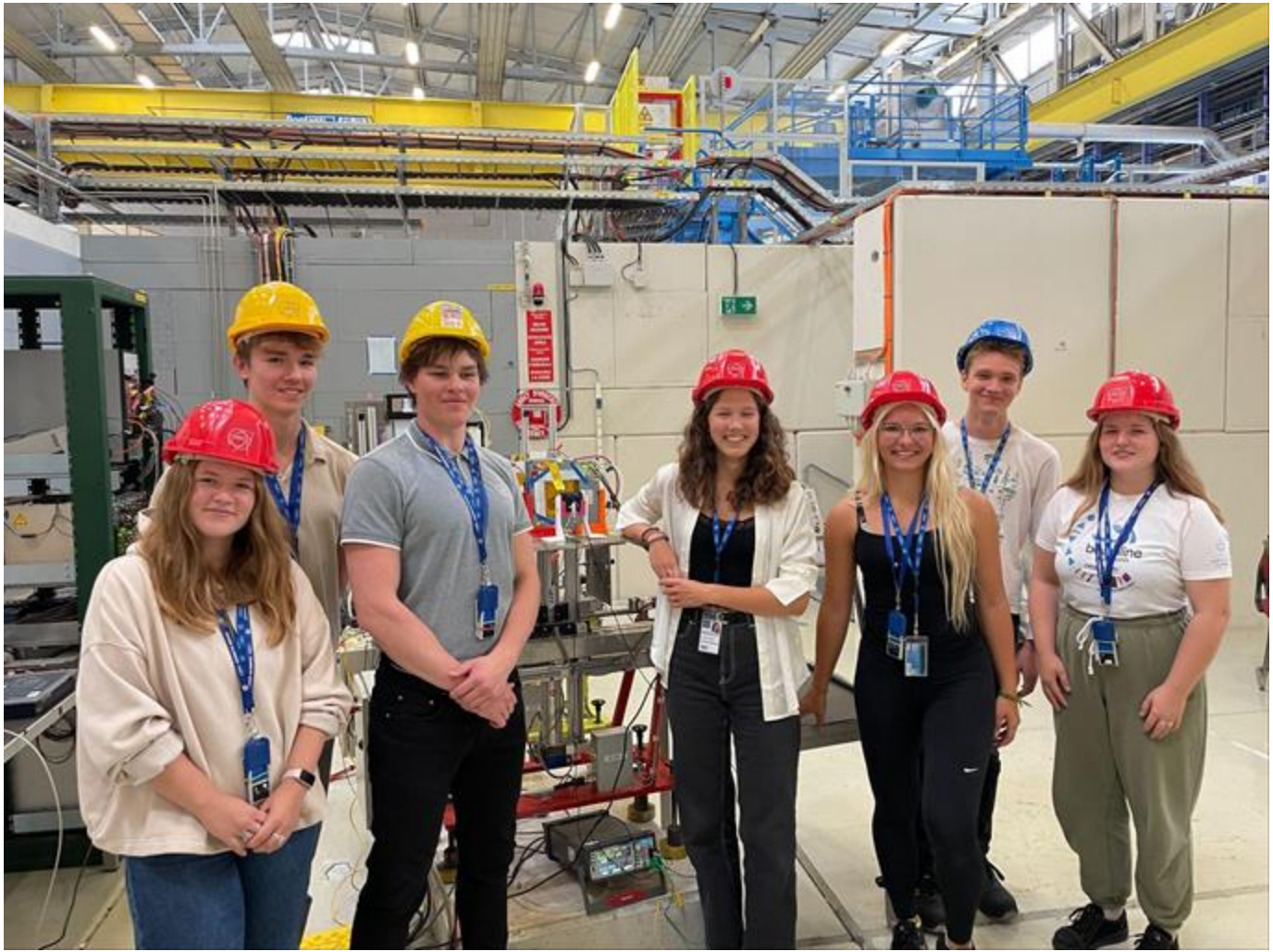




What comes next?

1) Outreach
2) Next experiments
    a) Continue studying the stratosphere
    b) Continue studying the correlation between the temperature and voltages
    c) Find out what happened on April 16th





Thank you!

We’d like to thank everyone who sacrificed their sleep hours, sanity and hard-earned money to make this event possible!