PS-SPS Users Meeting for Week 28 held on July 11th, 2024

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Physics Coordination schedule:

- July 8th onwards: E. Barbara Holzer
  :::
  :::danger
- Wednesday September 4th: User meeting exceptionally on zoom only for availability of the conference room (thursday September 5th is CERN holiday).
- Updated user schedule soon to be published.
  :::

News from the PS & SPS Physics Coordinator

E.B. Holzer, M.R. Jäkel

:::info

- **User Schedules v2.0.4** (for most of the lines **until end of August**) released: see User Webpage (https://ps-sps-coordination.web.cern.ch/ps-sps-coordination/)
- Please get in contact, if you want to take one of the week still free before June - Tanja (tetiana.shulha@cern.ch) is collecting all requests.
- 2024 injector schedule released EDMS 2872566 (https://edms.cern.ch/document/2872566/2.0)
  2024 approved LHC schedule EDMS 2872429 (https://edms.cern.ch/document/2872429/2.0)
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Proton Run 2024

- AD/ELENA Physics Stop Monday 02.12.2024
- SPS NA Physics Stop protons Thursday 31.10.2024
- PS EA Physics Stop protons Wednesday 27.11.2024

Ion Run 2024

- SPS NA Physics Start 4.11.2024 (maybe earlier if set-up is fast) - Stop Pb ions Monday 2.12.2024 (6h)
  - NA : Week 45-47 high energy
  - NA : Week 48 low energy (no LHC running)
- PS EA Physics Start 6.11.2024 (tbd) - Stop Pb ions Monday 2.12.2024 (6h)
  - CHIMERA: 13.11-2.12

Ion run Coordination Meeting : Tuesday 23.7 at 16h
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:::info
Reminder: Beam time exceeding the limits of 2 weeks PS beam time and 1 week SPS beam time per year need the approval of one of these CERN committees: SPSC, LHCC, DRDC, INTC, RB or IEFC. Consider joining a DRD collaboration, if you require more beam time.
:::

News from the Facilities Operations Meeting (FOM) (M. Jäkel)

:::danger

- **Exchange Magnet H2 beamline**: 30.7-1.8.2024.
  No Beam to North Area from Tuesday morning until (expected) Thursday afternoon/evening.
  :::

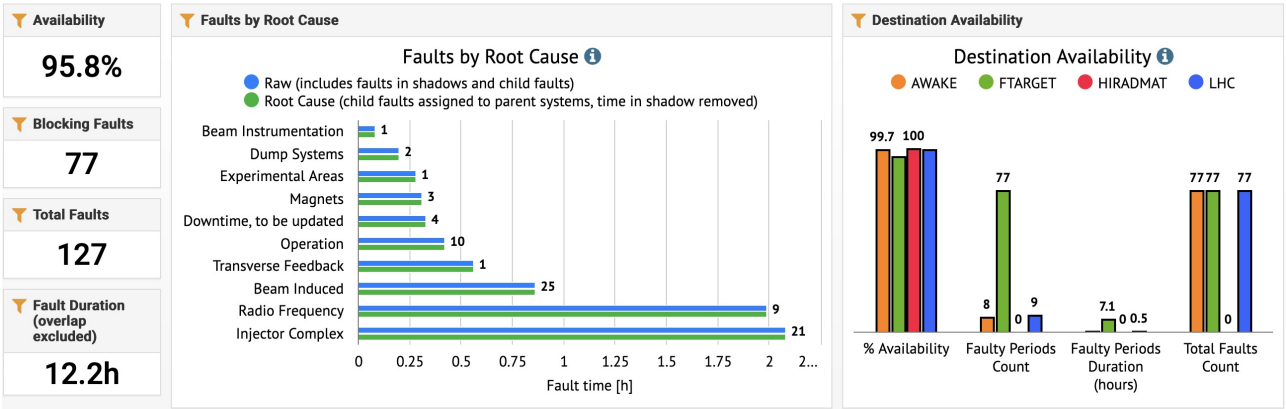
Upcoming SPS MDs next weeks :

- W28 No MDs (Postponed to W31)
- W29 Dedicated: 17.7 → extraction MD - NO access in BA80, BA81, and TCC8-ECN3
- W30 Dedicated: 24.7 → octupole assisted extraction TT20
- W31 Dedicated : 30.7 to 1.8 (shadow of magnet exchange)

PS Machine Report (Y. Dutheil)

- High availability (99%)
- Main points
  - Small beam interruptions from L4
  - Work on EAST beam to improve efficiency
  - AD MD on Wednesday on the effect of primary beam bunch length

SPS Machine Report (P. Arrutia)

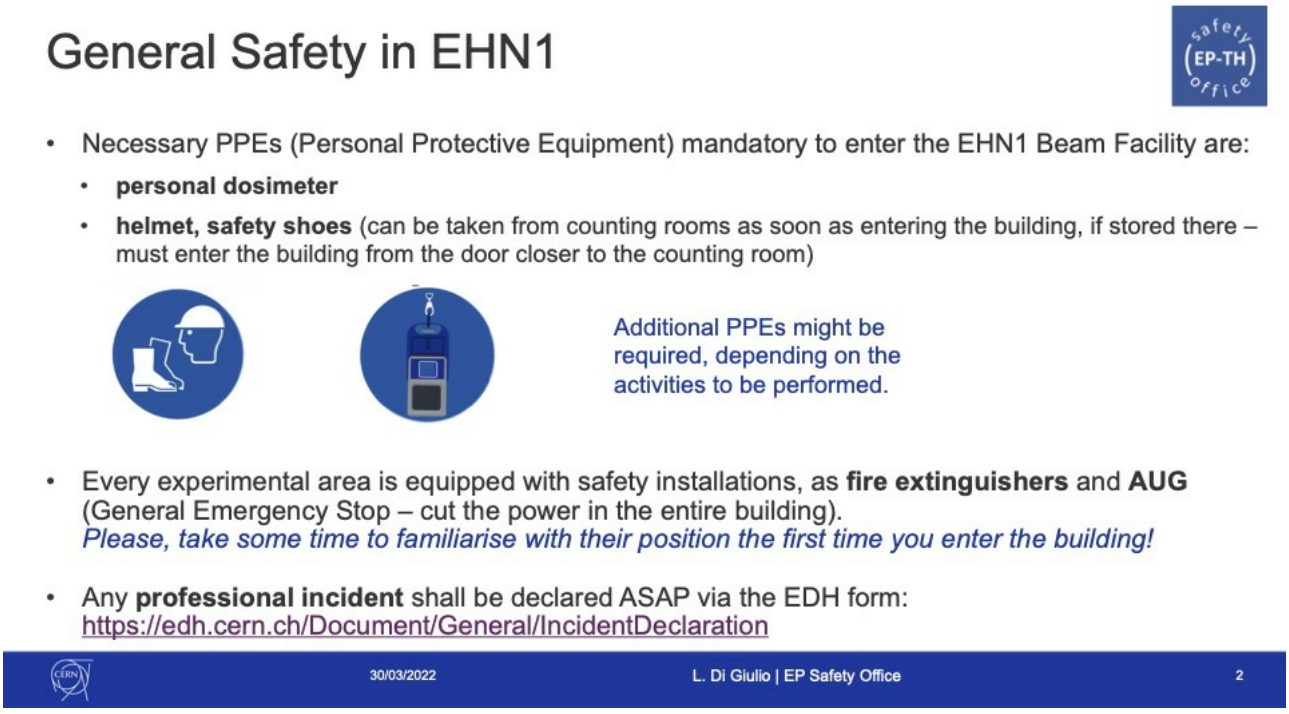


- High availability Thu-Thu: 95.8%
- Last week:
  - Bump in SFT spill fixed by re-optimising RF gymnastics

- This week:
    - No dedicated MD.
    - Monday: ~1h downtime due to transverse damper .
    - Wednesday: SFT change of intensity on T4 from 50 to 20.
    - Wednesday: ~1.5h downtime due to mis-driven settings when mapping new cycle.
- Plans:
    - Today: long parallel MD
    - Continue with SFT, LHC filling. AWAKE only electrons for the moment.
    - Dedicated MD on Wednesday next week

Safety (James Devine)

This week we have seen large numbers of:
1)People without helmets and safety shoes
2)People in shorts
This is great in Restaurant 1, but **not** in your experimental area.
You are reminded: A personal dosimeter, helmet and safety shoes are mandatory* in EHN1, 157.
*It is permitted to store your helmet and shoes in your counting room, however you must go straight there to retrive them upon entering the building. The dosimeter is mandatory at all times.
It is mandatory [(HSE memo) (https://edms.cern.ch/document/2193556/1)](https://edms.cern.ch/document/2193556/1) to wear long trousers in all areas where safety shoes are required, i.e. all experiment halls and beam line areas.

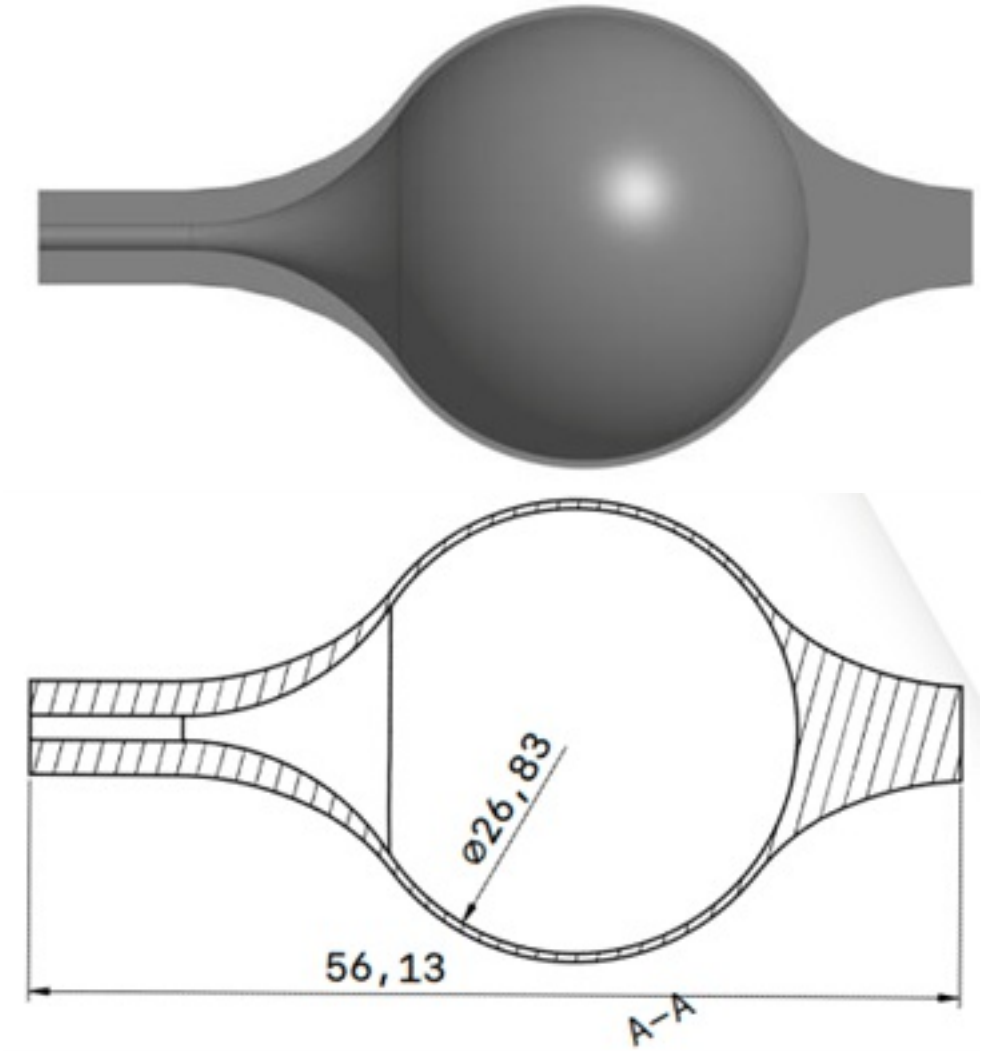


nToF (M.Bacak and P.M.Milazzo)

Smoth data taking in all experimental areas.
EAR1: last days of the r(En, g) campaign
EAR2: test of a diamond detector

NEAR: activation measurements

From 12.07 new campaign will start:
EAR1: Cu(n, g)
EAR2: test of feasibility of the challenging Ar(n, g) study (a dedicated container in aluminium and carbon fibre has been realized and tested at high pressures)



Technical drawings and real target container.

East Area Beam Status (L. Nevay)

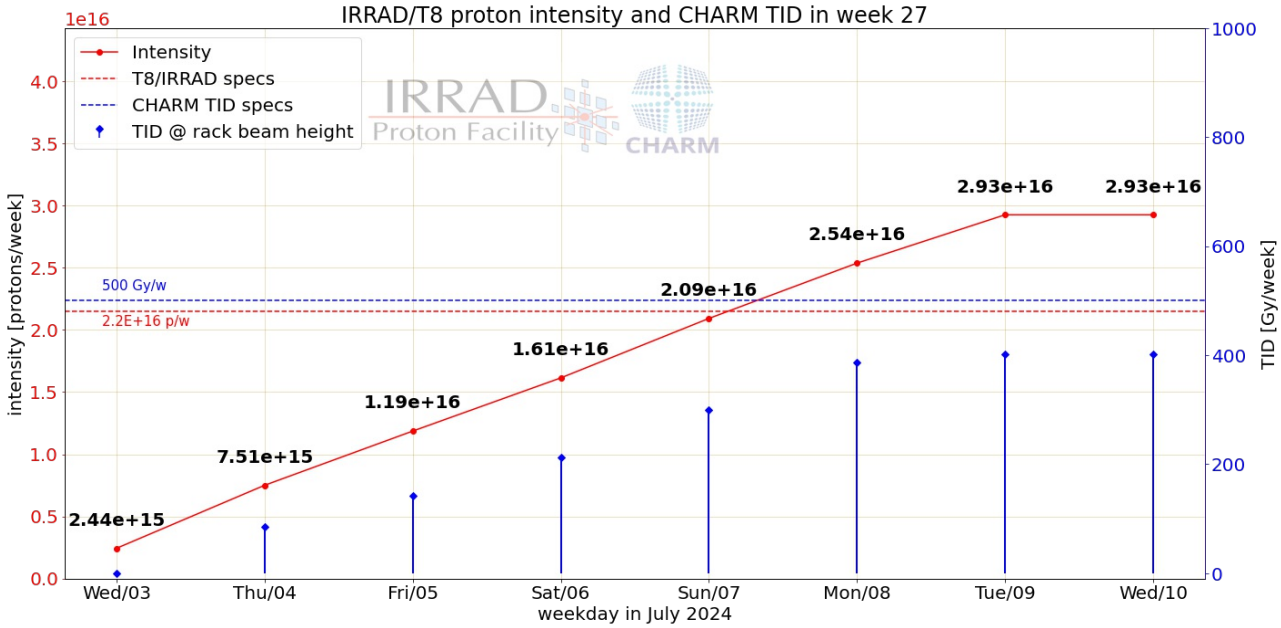
Standby phone number: **67500**

T09/T10: Good operation, no issues.
T11: No user.

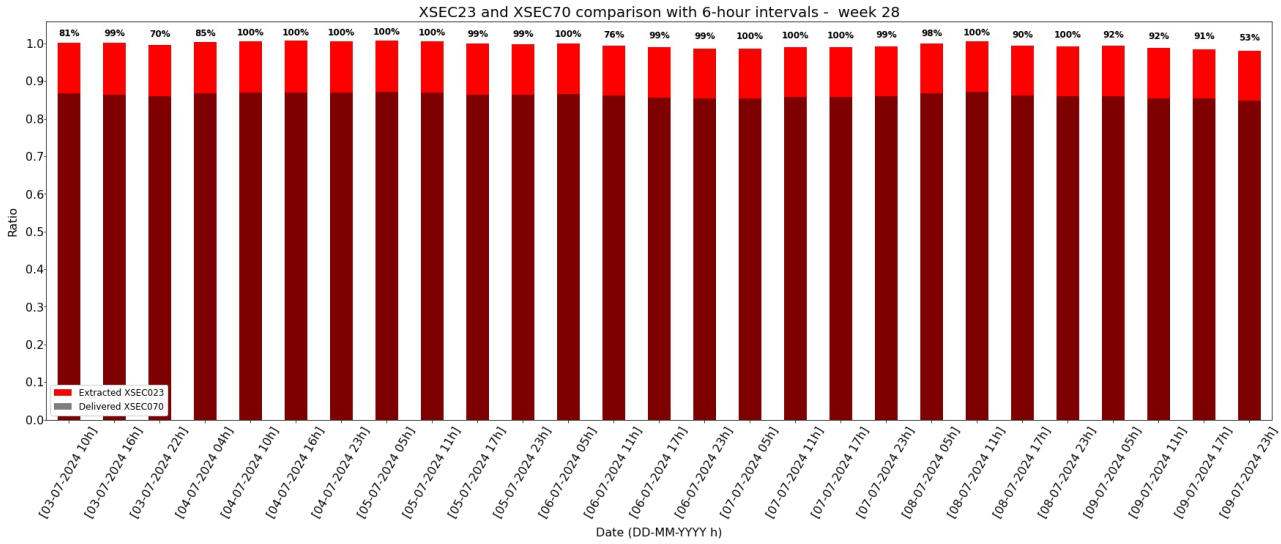
East Area Users Tour de Table

T8 Main: IRRAD/CHARM (F. Ravotti)

Very good week. Cumulated 2.9E16 p/w and a TID of 400 Gy as required by the current users in the CHARM area.



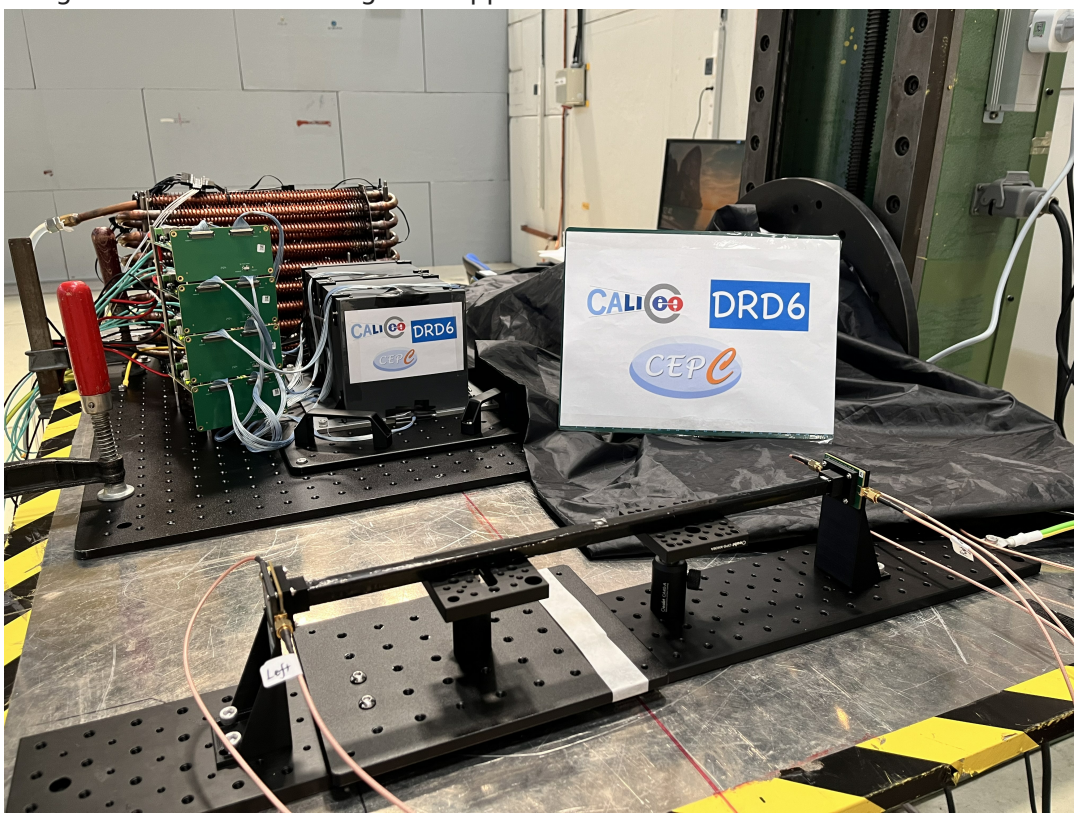
After three weeks where the beam was affected by larger "drifts" than usual (more often and with larger magnitude) the statistics of this week are back to the expected values we had until w23 (~95-96% of spills are centered on both axis, now in w27). Moreover, also the “slow” intensity drift basically disappeared this week (see plot below to be compared with the one in last week report).



During the access on Wednesday: (1) In CHARM we exchanged cards and components for BE-CEM, removed the SY-EPC setup and installed one for CMS-RPC. (2) In IRRAD we excahnged polymers/resin samples for TE-MSC, while the CMS MTD ETL and all other long-term experiments continue.

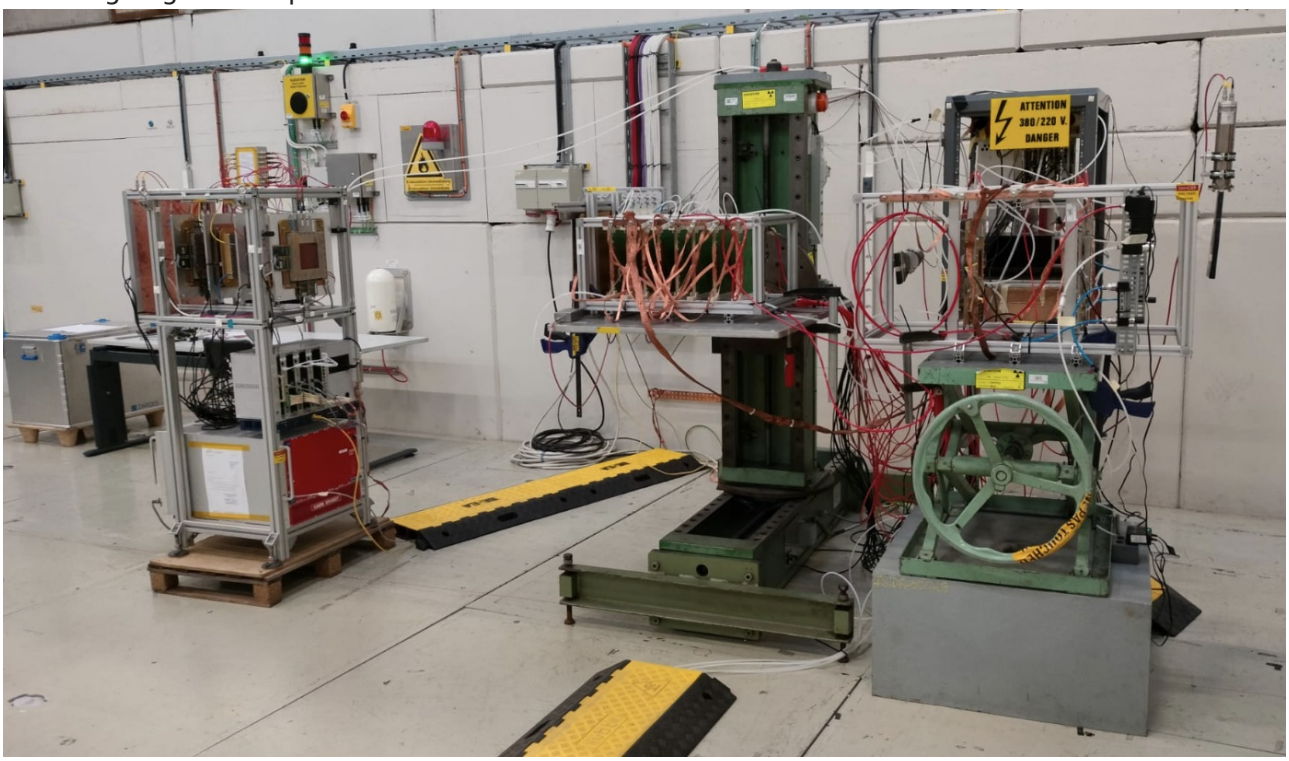
We continue until next Wednesday with the extracted standard high-intensity (8oE10 pps).

T9 Outgoing Main: CALICE/DRD6 (Yong Liu)

- Smooth data taking: crystal calorimeter prototype
    - Muons: 5 GeV; electrons: 1 – 10 GeV; pions 1-10 GeV
    - Electron data: with varying beam collimator slits to study impacts from beam momentum spreads
    - A new SiPM-readout electronics chip (32-ch)
- Timing studies with crystal-SiPM units
    - Crystal bars with different lengths
    - Several combinations of SiPM and preamp types
    - Oscilloscopes: 5 GS/s and 16 GS/s
- Summary: a successful beamtest for CALICE/DRD6
    - Collected decent statistics of data samples
    - Enabling EM and hadronic shower studies, and timing performance studies
    - Dismantling and wrap-up completed in July 10 morning
    - A big Thank-You for all the great support received
    - 

T9 Main: MPGDCAL (Luigi Longo)

Gained half day wrt the schedule thanks to all the help we received in moving from SPS to PS all our equipments.
Setup is in place and the safety inspection just happened $\rightarrow$ everything fine
We are going to set up the beam and start our measurements



T10 Outgoing Main: ALICE TIMING (Manuel Colocci)

- Took data successfully (CMOS-LGADs, LGADs and SiPMs), out of the zone on Wed at 10.00

T10 Main: IDEA CC (Please Put Your Name Here)

North Area Beam Status (L. Nevay)

Standby phone number: **67500**

Proposed proton sharing with T4 wobbling at -120 GeV/c in H6, -300 GeV/c in H8, and 500 mm T4 target head:

T2	T4	T10	T6
30	20	≈ 1	30

From next week, Wed, 17.07.24, with standard T4 wobbling (120 GeV/c in H6, 180 GeV/c in H8) and 180 mm T4 target head:

T2	T4	T10	T6
30	42	21	30

General: Reduced number of protons on T4 but with a longer target to provide low intensity run for NA62. Despite the lower number of protons, the e- beams for H6 and H8 will be better and the overall intensity to H6/H8 does not change.

H2: Beamline limited to 150 GeV/c. NA61 beam tuning ongoing, CEDAR issues solved by SY/BI. "Moving beam" issue present, corellated with H8 beam file loading.
H4: Smooth operation. Still issues with the NP04 HP XCET, a device will be borrowed from T10 and installed today.
H6: Good operation. First e- beams of the year with good rate and purity.
H8: Good operation, no issues. Request to do optics measurements for a couple of hours, most probably easiest on Friday.
P42/K12: Prepared low intensity for NA62.
M2: Issue with pressure sensor for CEDAR02 in M2 from last Thursday, solved on Saturday morning. Other than that, good operation. Test with high intensity planned on July 19th, 08-12, with 150 units on T6 during this time.

Outgoing HiRadMat (N. Charitonidis)

Very smooth data taking, thanks a lot to all the injectors and the coordinators / operator crews!

AWAKE (M. Bergamaschi)

	M	T	W
SPS extractions to AWAKE	140	234	Electron beam
Hours of beam to AWAKE	1.3	2.2	Electron beam

Detailed program:

- Monday: issue with e-beam modulator required morning access, afternoon check of proton bunch parameters and protons diagnostics
- Tuesday: start of plasma studies, interupted by problem of plasma source the required an access
- Wednesday: problem with access system (cable veto faulty) that required access in the morning, afternoon dedicated to e-beam studies

North Area Users Tour de Table

P42-K12:

Main: NA62 (Michal Zamkovsky)

We would like to thank for the setup of the low intensity beam for NA62.

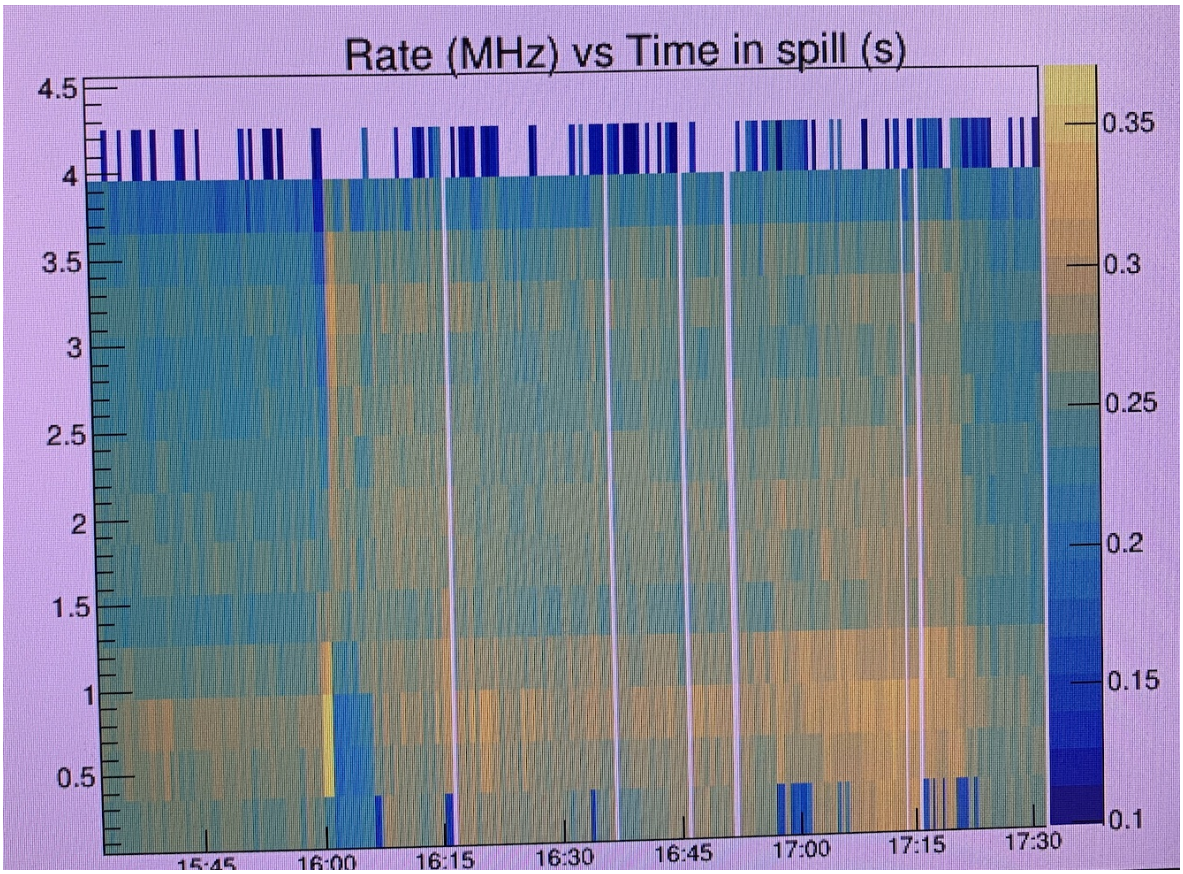
We had a problem with the power cut on Monday and cancelled the night shift.
We closed the access and notified CCC that experiment will be without shifters.
Then we found that during the night we had beam on T10.
We benefited from the down-time and BE-EA team fixed the problematic electrovalve in sector 1 of K12.

We noticed the parallel MDs (Ship MD) during every day - will it be like that for the whole week?

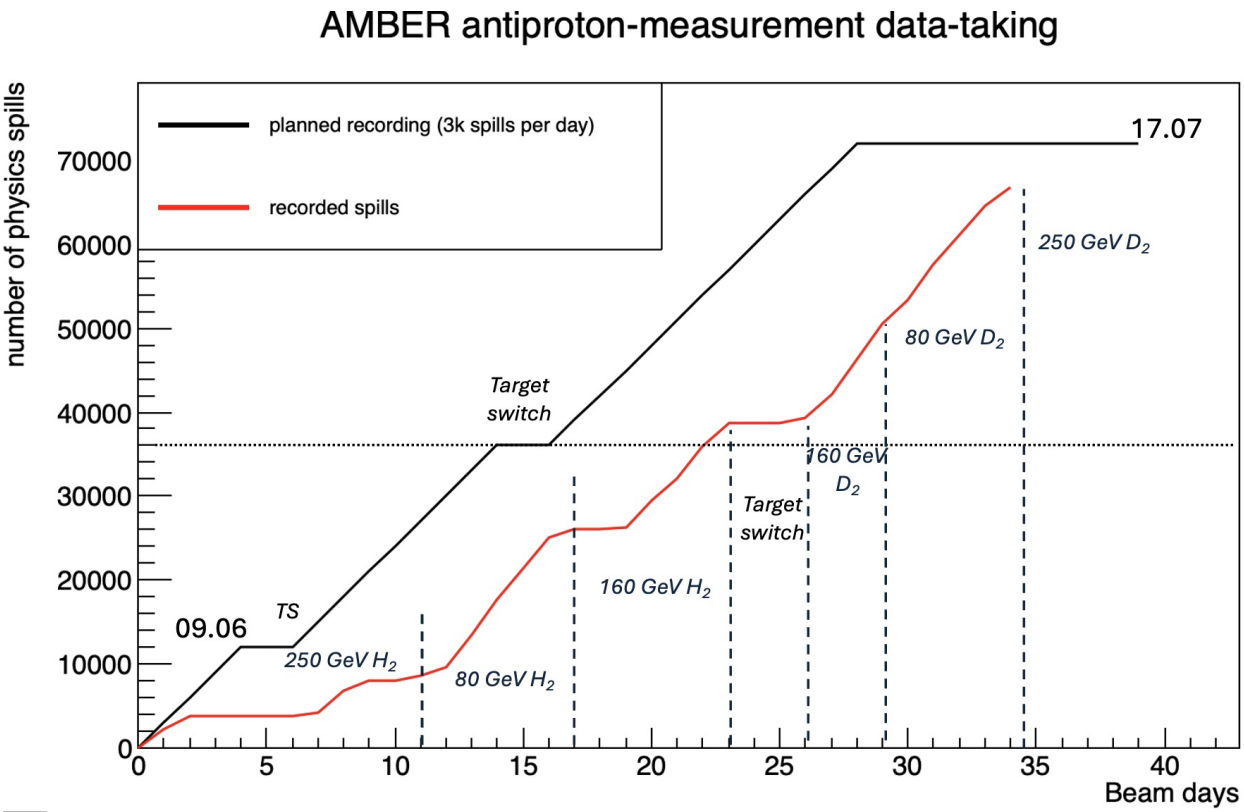
M2:

Main: AMBER (Thomas Poschl, Josef Novy)

- data taking with Deuterium target ongoing
- last week(end) very productive beam delivery
- last Friday evening/night issue with Cedar2 pressure sensor readout -> not able to set pressure until a remotel power cycle saturday morning (around 9h of data without Cedar 2)
- since Monday during the day issues with beam quality (varying intensity, changing count rates on veto detectors/ changes of halo, empty spills, 50Hz noise, inhomogenous intensity in spill)(took additional spills to compensate for potential problematic runs)

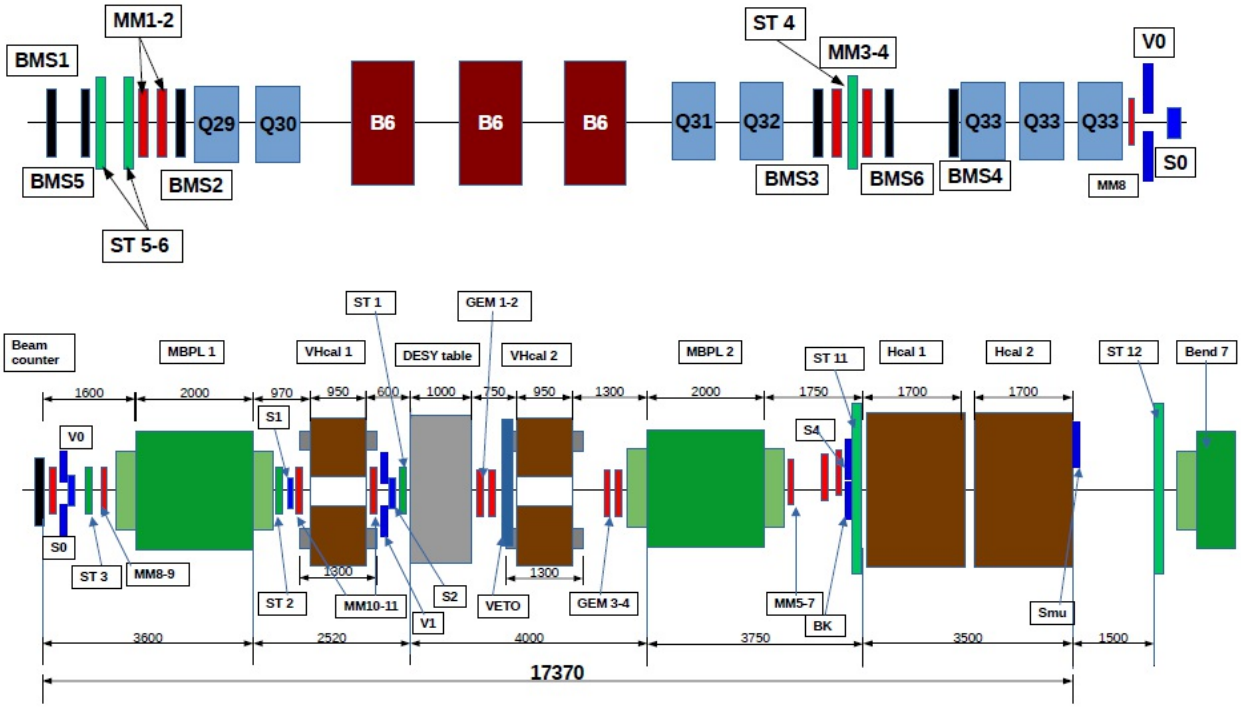


- finished 160 GeV/c, 80 GeV/c
- currently switching to 250 GeV/c
- back in schedule to perform systematic studies (Cedar studies, Empty-target studies) at the end of beam time (end of beam, Wednesday 08:00)



Incoming Main: NA64mu (Week 29) (Vladimir Poliakov)

NA64 setup



The installation of all equipment will start July 18 after dismounting of CEDARs in M2 tunnel. The high intensity muon beam test will be Friday morning, July 19. The two hadron calorimeters and large Straw detectors will installed at Friday afternoon.

The installation and commissioning all NA64 detectors until Friday July 26, when will be safety visit.

H2:

Main: NA61 SHINE (P. Podlaski, B. Maksiak)

- Some issues on the way:
    - Power glitch: all our equipment went OFF on Tuesday (9.07) morning, similarily as in AUL trigger, but **no AUL was pressed!**. EN-EL suspects glitch on 48V supply line
    - Problem with one of the DWCs borrowed from CMS
        - The efficiency was dropping significantly over time, we observed it during the weekend
        - Inaki tried to remotely increase HV but it helped only short-term
        - Strange noise was observed on the timing outputs
        - BE-BI discovered that there was no gas flowing, HV interlock did not work
        - Chamber was replaced on Monday, gas flow restored, since then works nicely
    - **Jumping beam is back.** This time we correlated it with H8
    - CEDAR alignment and timing issues, solved yesterday by Inaki
- Setup was finished yesterday, over the night we took pilot physics data
- Proper physics running will start today afternoon

H4:

Outgoing Main: DRD1 (Karl Jonathan Floethner)

Beam
Good Muon Beam Purity (as in April - no showers produced by hadrons in our detectors)
Pion Beam: >10e+7/spill (good for the tiggered tests with VMM3a)
Rate (both muons/pions): Very Satisfied. Huge thanks to Nikos and Frederic (Aberle, RP) for helping optimize beam intensity and RP alarms in April. DAQ rate doubled in some setup. Very important and really appreciated.

Setups
All 8 groups being able to take useful data and majority to complete the planned tests (PICOSEC mm, PICOSEC uRWELL, MINICACTUS, STRAW, GDD/DRD1 Tracker, cylindrical µGroove USTC, MPGDHCAL, FCCmuons).
See attached slides for more information.

Sharing with GIF
Everything going smoothly on our side (only problem was from time to time disabled phone in control room). 3 access scheme as base works very good. Thanks for accepting additional unforeseen accesses. The shared end-of-the-beam-bbq was excellent as always.

De-Installation
Very fast this time (all setups have been ready to move out before 10am).
Next test beam in September/October. Part of the equipment left in the area and in the storage close to H4 (very helpful to minimize crane use and facilitate our next installation).

Thanks to everybody for the support

Outgoing Parallel: GIF++ (Paolo Martinengo)

Data taking successfully ended, all users happy
Reconfigured for beam pipe in the bunker, some delay due to
issue with isobutane line (electrovalve)

Main: NP04 (Christos Touramanis)

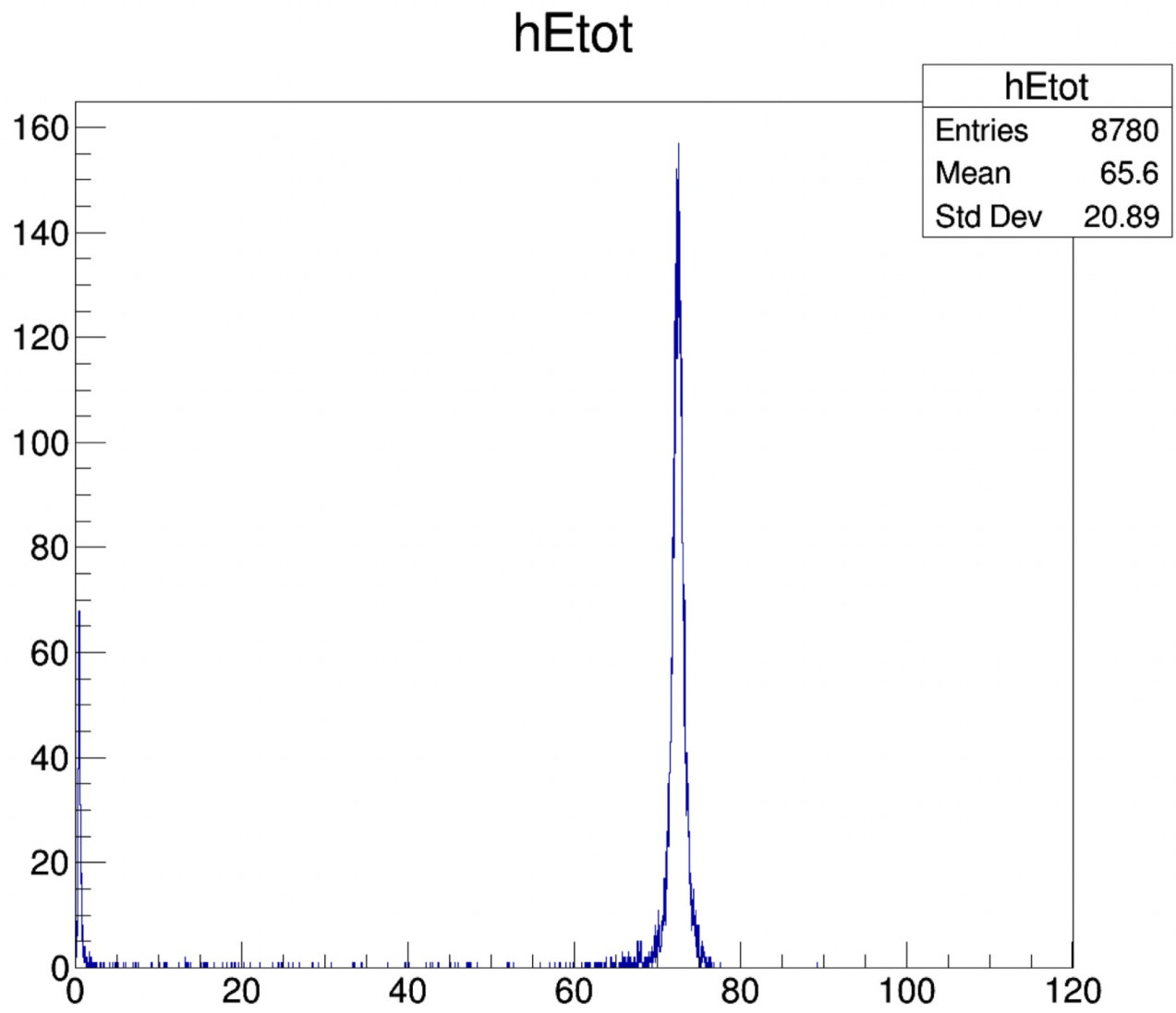
Firstly, apologies for beig double-booked and not able to attend today. Here is our summary:
Since our beam two weeks ago we optimised our DAQ and now we can take data at 40 Hz (previously 25).
We received first beam yesterday at around 16:30 and took data at 7 GeV until this morning.
Main concern is the beamline Cherenkov (the High Pressure one) which was not working since we started this year.
Further studies (thank you Inaki) concluded yesterday that the light/optics is the problem, everything else was checked and works.
Today we exepect an exchange with another Cherenkov from the East Area (Nikos coordinating, thank you).
By the end of today we aim to start our physics data-taking with pions at 1 GeV, changing sign every couple of days to have a balanced data set in case of beam delivery problems.
Reconstructed events from our first week of beam were shown already by the CERN Director for Research and Computing at the ECFA meeting last week, and also on various media.

H6:

Outgoing Main: POKER (Andrea Celentano)

Very productive beam time!

- Installation and the safety inspection done on Wednsday, July 3th
- Trigger and DAQ commissioning on Thursday, July 4th
- Friday and weekend main task: Micromegas commissioning (saturday afternoon a gas leakage was found in the gas line connecting the gas bootle from the outside storage area to the EHN1/R-K52 - very good support from gas team who helped us to solve the issue)
- Monday and Tuesday: data taking with e- beam, from 10 GeV/c to 100 GeV/c at 10 GeV/c steps. Momentum collimators closed to +- 0.5 mm to minimize momentum spread. Excellent beam intrinsic momentum spread.
  ** See below for the energy distribution collected with 80 GeV e- beam (no leakage correction neither SiPM saturation effect corrected for).
- Tuesday: intensity scan with mixed 120 GeV/c - maximum value was 4E6 particles/spill -- we triggered radiation alarm.



Main: MUONE ECAL (Fred Gray)

Installation is essentially complete, and we received our safety clearance just before this meeting. We are continuing to diagnose a few unstable APD channels and complete a few remaining tasks to prepare the detectors. We expect to close the area and start collecting beam data starting in the early afternoon today.

Many thanks to Inaki et al. for splitting the signal from the trigger scintillator, to Laurie for preparing beam files and providing training yesterday, to Alex for safety advice, and to the crane staff for installing an iron block for our muon veto.

Incoming Main: DRD6 MAXICC (Week 29) (Marco Lucchini)

Setup is ready for installation on Wednesday 17th.
Requested safety inspection at 17h00 and patrol training.
Will NOT need a crane for transport material
Will need a DWC, a DESY table and a rack to house a VME and a NIM crate as in the original request.
Setup will be housed in a 60x60x60 cm box located on the DESY table and cooled with chiller.

Beam requirements:

- beam size: <1cm rms
- mostly 20 GeV electron beam
- few runs with higher electron energy (50-150 GeV) if available
- few run with pions/muons (any energy is OK)

H8:

Outgoing Main: FASER NU (Akitaka Ariga)

Goal:

- Detector performance tests: efficiency, stability
- Momentum calibration of FASERnu detector (50,100,200,300 mu-)
- Hadron id/mom/teraction studies (50,100,200,300 hadrons-)
- FASERnu upgread prototype test

History

- Wed (3rd July)-Thu, Beam tuning
- Thu, test emulsion detector irradiation
- Friday-Wed yesterday, irradiation
- Irradiation is completed Wed night
- Thu today, we will clean up the zone
- Next days, chemical processing of emulsion films in Meyrin

No major issues on beam. Great!
A couple of time, magnets lost current (500A -> 20A in most of magnets). Solved by CCC.
A slight delay due to a user-side issue of irradiation procedure.

We thank very much Martin, Barbara, Michail, Maarten, Johannes for everything, in particular for an additional day of beam time.

Beam profile seen in an test emulsion film (200 GeV h-)

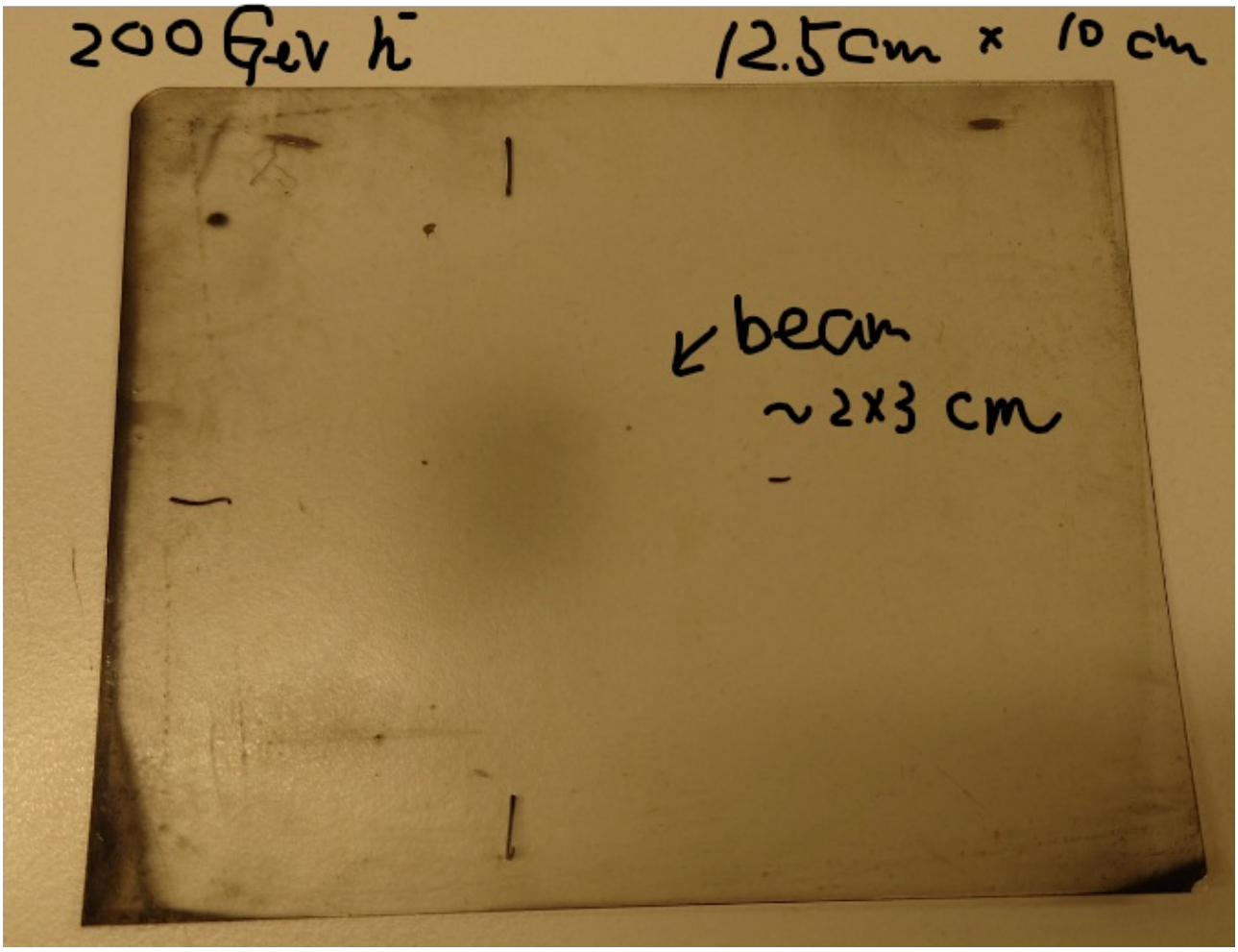
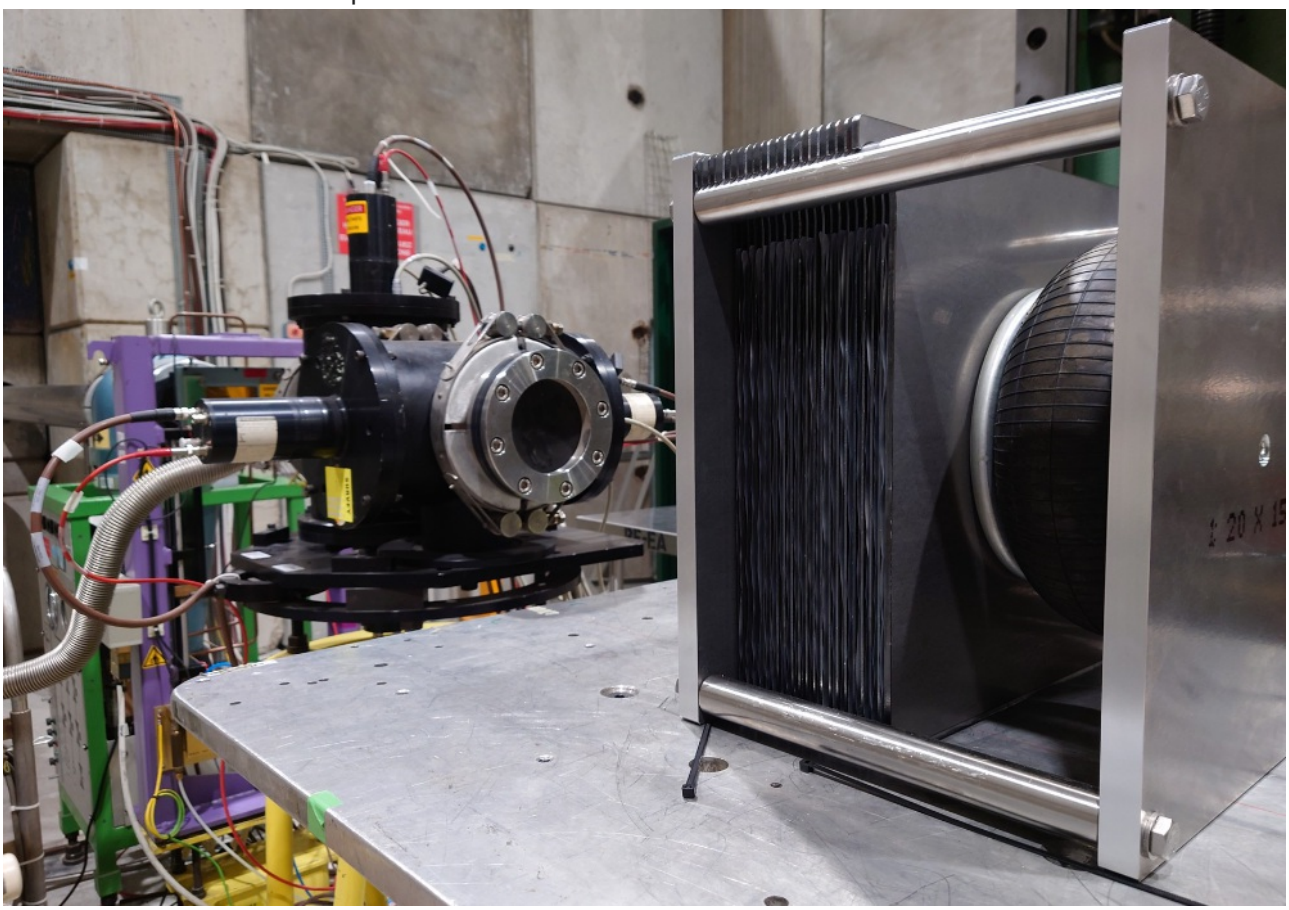


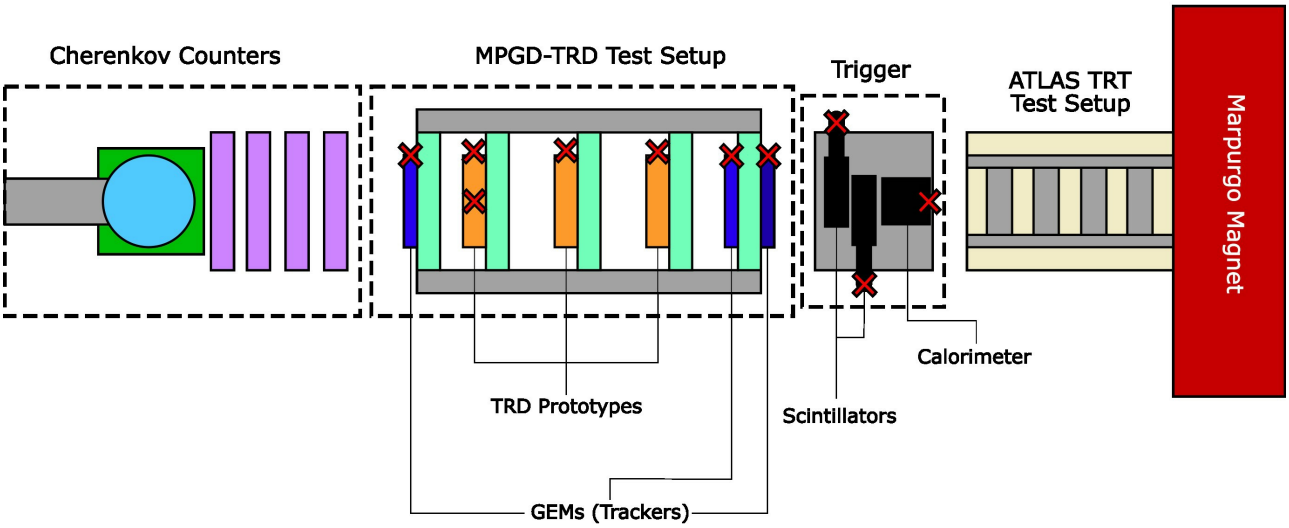
Photo of an emulsion setup.

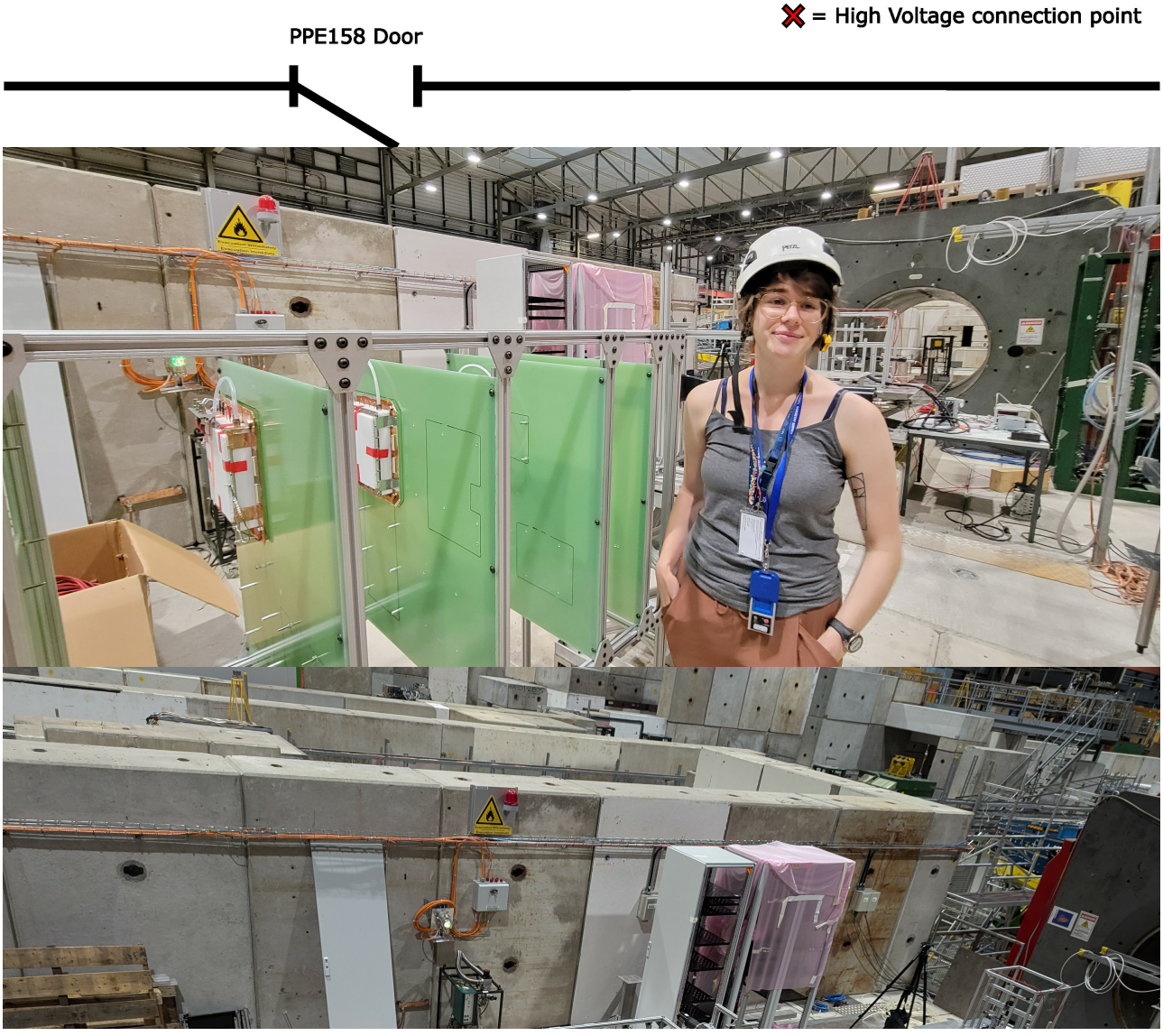


Main: MPGD TRD (Yulia Furletova)

Our shipment with equipment has been arrived few days ago. Starting to assemble. After discussions with ATLAS-TRT team - requesting to shift our setup to PPE158 (control room (887-R-Q60))- we are planning to use the same beam and Cherenkov det settings,and will relay on the ATLAS-TRT calorimeter and trigger setups.
On the Cherenkov detector- we will need an analog signal in the zone (we are going to read it out with our fADC system).
Requesting to move our Ar/CO2 gas to the PPE158 as well. Planning to have a safety check on Wed.
Beam setup: electron beam 10-20 GeV, pion beam

MPGD-TRD Test Beam Experiment for H8 PPE158, July 2024
(Top-Down View)





Parasitic Users

H4 Outgoing: MINICACTUS (Please Put Your Name Here)

H6: ATLAS MALTA (Please Put Your Name Here)

H4 Outgoing : STRAW TRACKER RD (Please Put Your Name Here)

AoB

Minutes by the respective speakers, edited by E. B. Holzer, M. Jäkel, T. Shulha, and M. Schwinzerl