

## **PS-SPS Users Meeting for Week 32 held on August 8th, 2024**

- September 4th: User meeting exceptionally on **Wednesday** on zoom only (05.09 is CERN holiday).
- **Updated user schedule v3.1.0.**
- Please get in contact, if you want to take one of the weeks without assigned main user - Tanja ([tetiana.shulha@cern.ch](mailto:tetiana.shulha@cern.ch)) is collecting all requests.

## **News from the PS & SPS Physics Coordinator**

E.B. Holzer, M.R. Jäkel

- 2024 injector schedule released [EDMS 2872566](#)  
2024 approved LHC schedule [EDMS 2872429](#)

## **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

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 IEF. Consider joining a DRD collaboration, if you require more beam time.

## **News from the Facilities Operations Meeting (FOM) (E.B. Holzer)**

Target intensities:

- August 2nd to 12th: 55 units on T10 (will required an estimated 75 to 85 units on T4) then reduce again to 21 units on T10 (about 42 units on T4)
- T2: 30 units

- T6: 30 units

### **Upcoming SPS MDs next weeks :**

<https://be-dep-ea.web.cern.ch/content/md-planning-north-area>

Dedicated SPS MDs - if not announced differently - are taking place from 8:00 to 18:00

- No dedicated MDs for week 32, 33, 34

### **PS Machine Report (Alex Huschauer)**

Excellent availability of 98.1%.

#### **Main issues**

- intermittent trips of BFA09 (used for SFTPRO), slight performance degradation
  - fixed by reboot of fast interlock system
- three trips of extraction septum SMH16, linked to vacuum spikes
  - reason not understood, might be caused by beam loss
- minor issues with 10 MHz cavities yesterday, fixed by expert intervention without beam stop

#### **Status of beams**

- trajectory steering auto-pilot
  - re-enabled on TOF
  - working on uniformisation of parasitic trajectory
- TOF
  - pushed single bunch intensity to 1E13 yesterday, running at ~9E12 now (very good performance at this intensity, slightly more losses at 1E13)
  - continued work on high-intensity parasitic TOF (800E10 p)
    - setup and checks of EAST spills at 30 and 80E10 look very promising
  - doubleTOF beam tested again yesterday night, intensity pushed to 2x800E10
  - work on 44 ns optics ongoing to potentially reduce losses in FTN
- SFTPRO intensity increase yesterday
- many beam variants prepared and sent to HRMT

## **SPS Machine Report (Michael Schenk)**

- **Machine availability** (Thursday - Thursday): ~91 %
  - N.B.: not reflecting delay of NA restart after magnet exchange last week (originally planned for Thursday 6 p.m., eventually restarted Friday ~12 p.m. due to the TAX issue). Followed by major fault on ZS tank 2 on Friday afternoon (~7 h).
  - Since then running smoothly apart from a few short faults (BSI, bend magnet in T4, some mains trips, North transfer safety chain)
- **This week**
  - NA
    - Beam dump run started yesterday with increase of intensity on T4 from 55 to 100 units to reach 50 - 55 units on T10. Went smoothly. Stays until 19. August.
    - Decent spill noise performance
  - Hiradmat two-week run started Monday
    - Good machine availability
    - Some issues with beam stability / loss at flat bottom for  $1.8E11$  ppb (288 b) beam and horizontal emittance for indivs.
    - Typically running afternoons till late evenings
  - No SPS MDs
  - Under discussion: potential slot for LHC MD beam preparation tomorrow Friday 7 a.m. - 1 p.m.
- **Next week**
  - Continuation of Hiradmat run
  - LHC beam preparation on Friday (8 a.m. - 6 p.m.)
  - No SPS MDs

## **Safety (A. Schouten)**

- General reminder for ISIEC inspections (request 1 week in advance)

## **nToF (Michael Bacak and Paolo M Milazzo)**

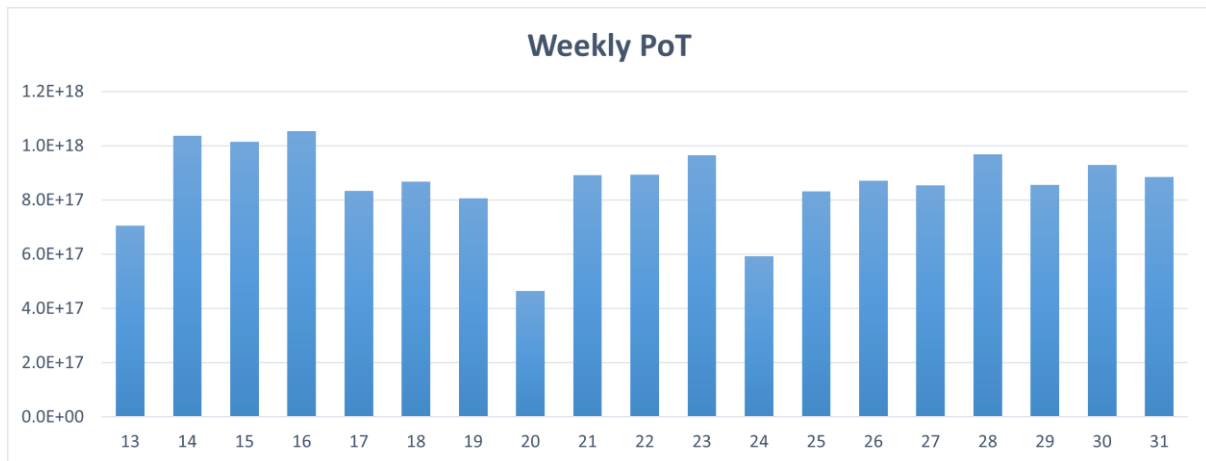
Smooth data taking in all experimental areas.

EAR1: last days of the  $^{63}\text{Cu}(n, g)$  measurements, from Monday 12.08 start of the  $^{238}\text{U}(n, g)$  campaign. No need for changes in the experimental set-up.

EAR2:  $^{88}\text{Zr}(n, g)$  measurement. Isotopic production has been provided at Los Alamos laboratories and sent to PSI where the sample will be prepared. Then, the sample will be directly placed on beam on 16.08.

In the meanwhile auxiliary measurements are running for normalization, evaluation of the background and detector calibrations.

NEAR: activation measurements



Protons received in standard conditions

### East Area Beam Status (M. Van Dijk)

On call number: **67500**

T09: Good operation.

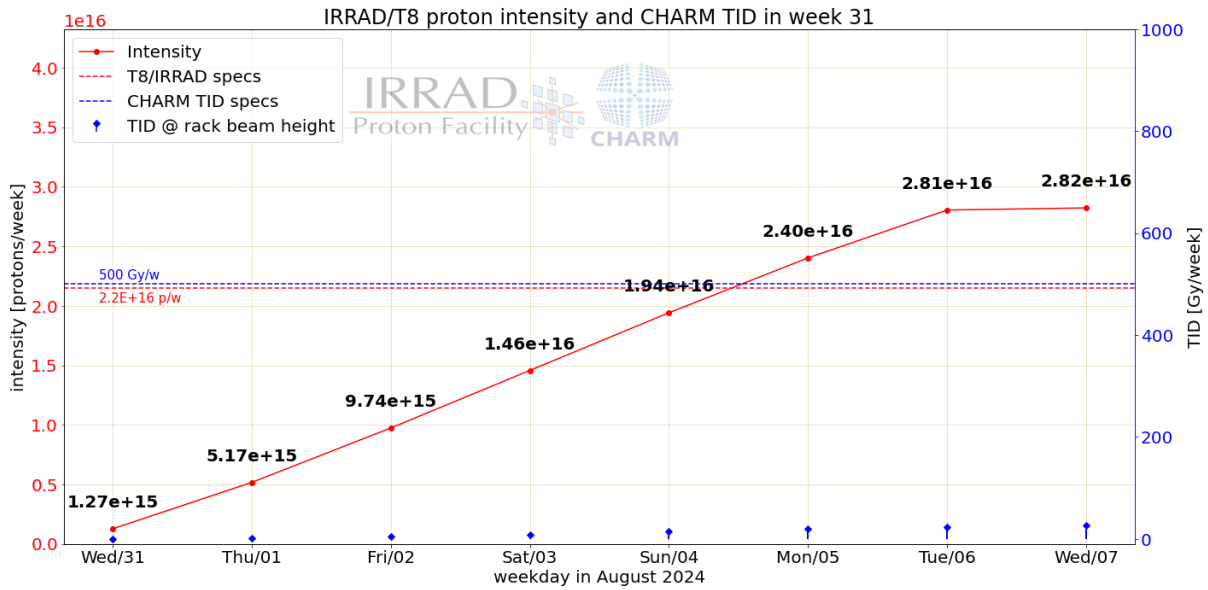
T10: Good operation.

T11: P349 installation underway.

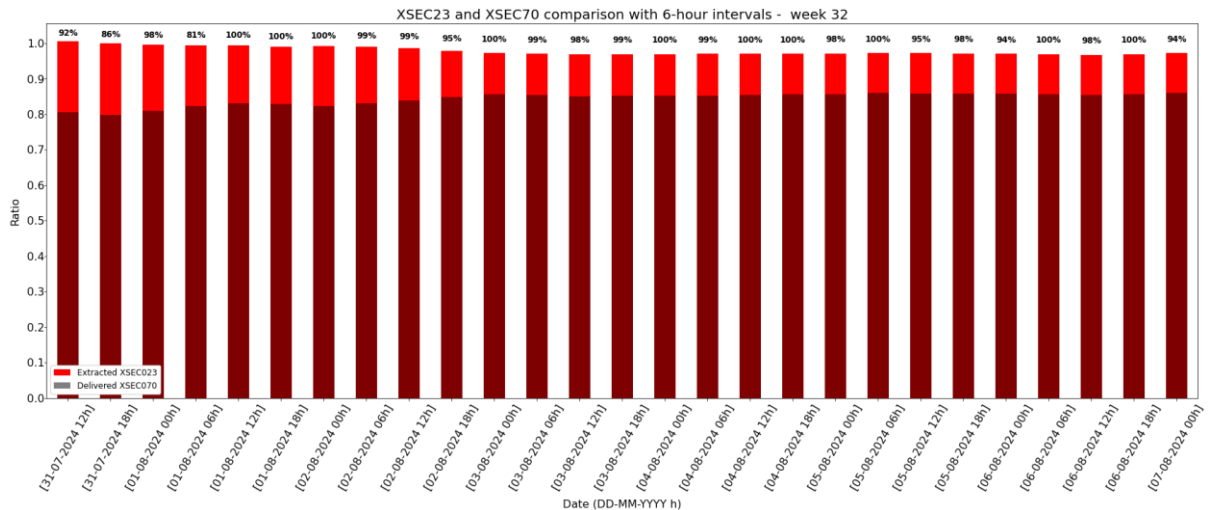
### East Area Users Tour de Table

#### T8 Main: IRRAD/CHARM (F. Ravotti / S. Fiore)

Very good week in T8, protons reached  $2.82\text{E}16$ .



T8 transmission optimized at the beginning of the week (see plot below).



In IRRAD we finished with the EP-DT-DD R&D (DRD3) experiment and continuing with long-term experiments (TE-MS, EN-MME).

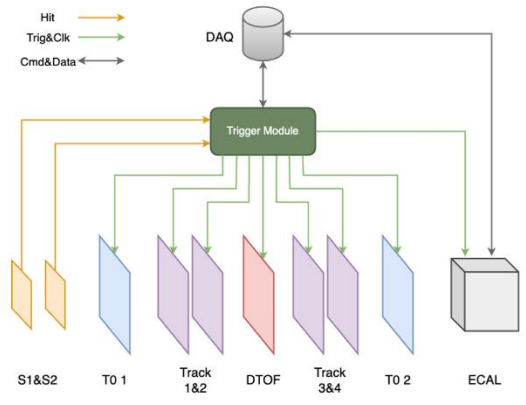
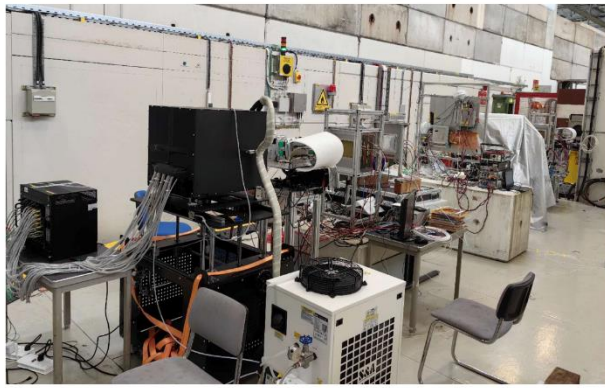
In CHARM no testing last week as per user request. Yesterday new setup for ATLAS mounted, CMS and BE-CEM-EPR modified

### T9 Main: STCF ECAL&PID (Yunlong Zhang)

The detectors were installed in T9.

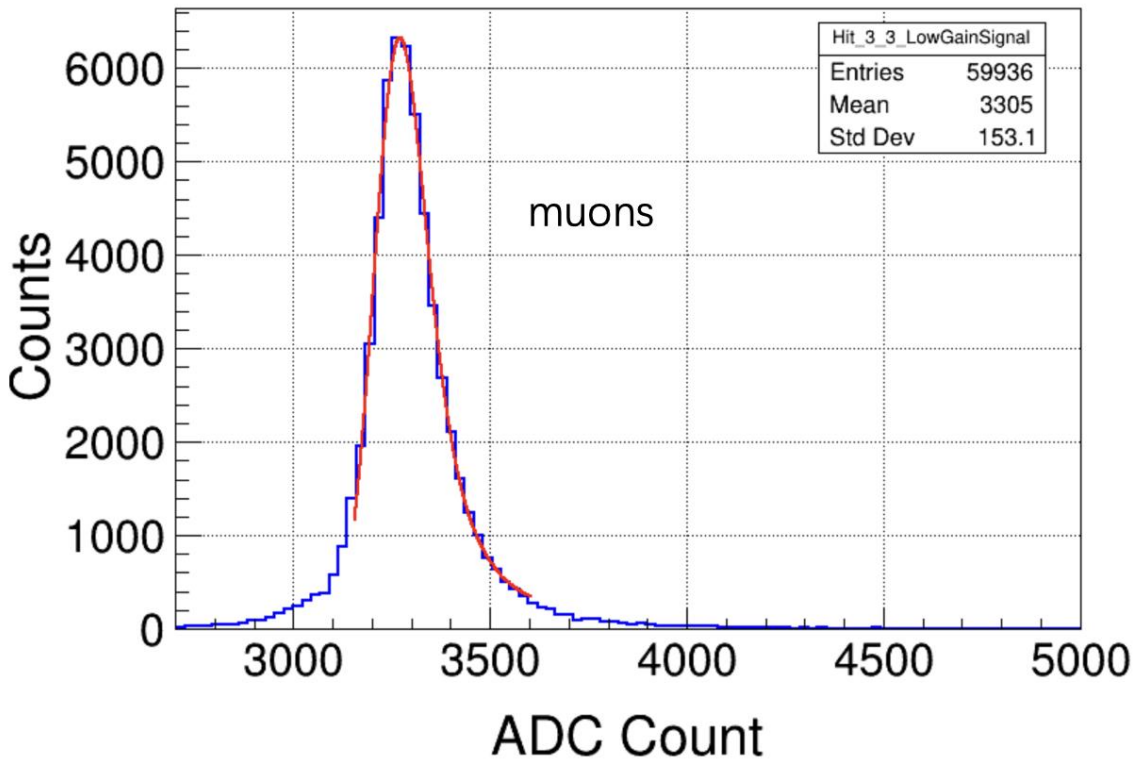
The beam has worked well. We have used the muons, e, hadrons to test.

Detectors:

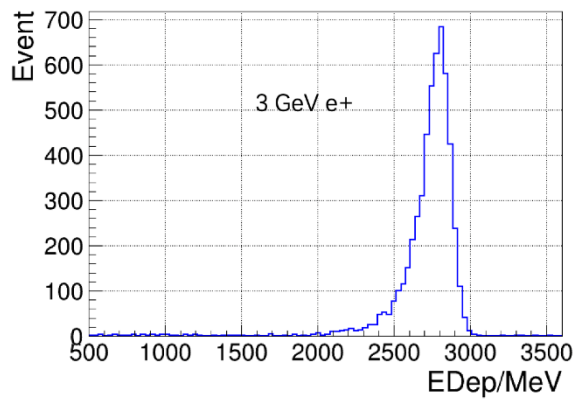
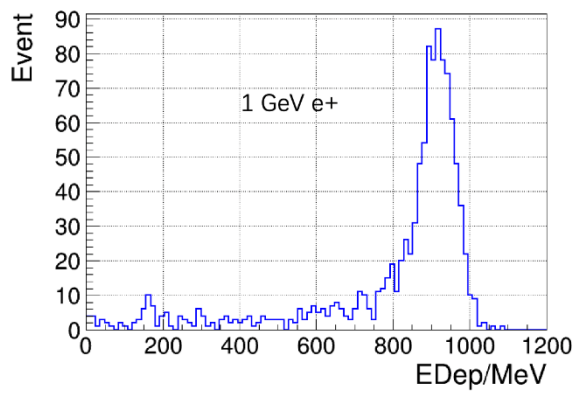


Calorimeter:

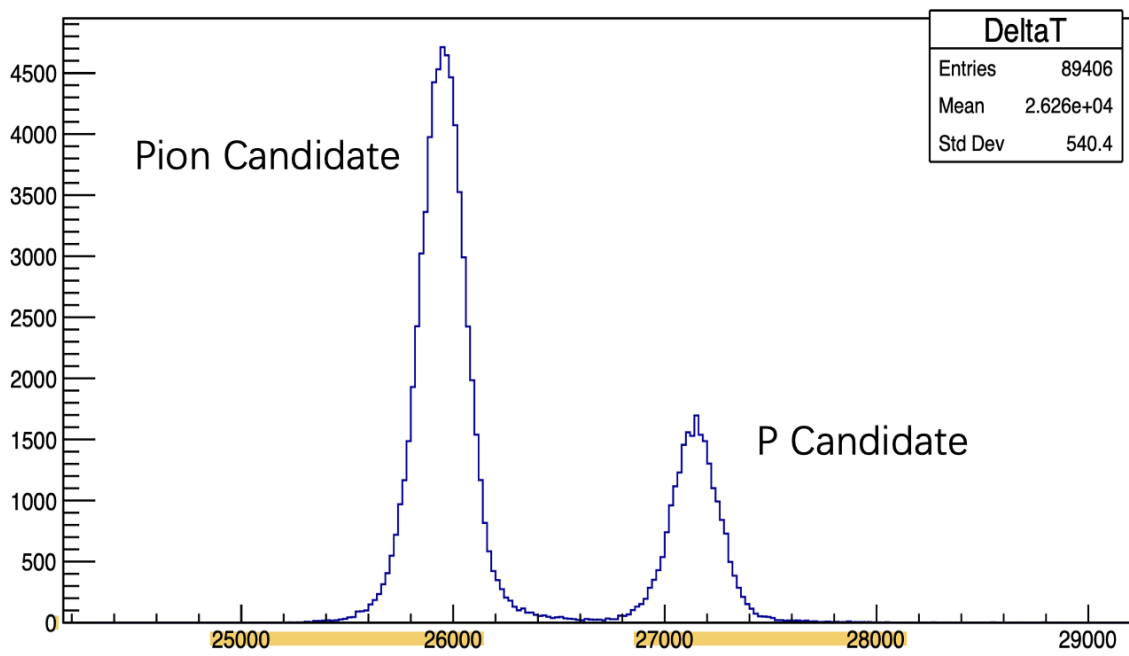
muons:



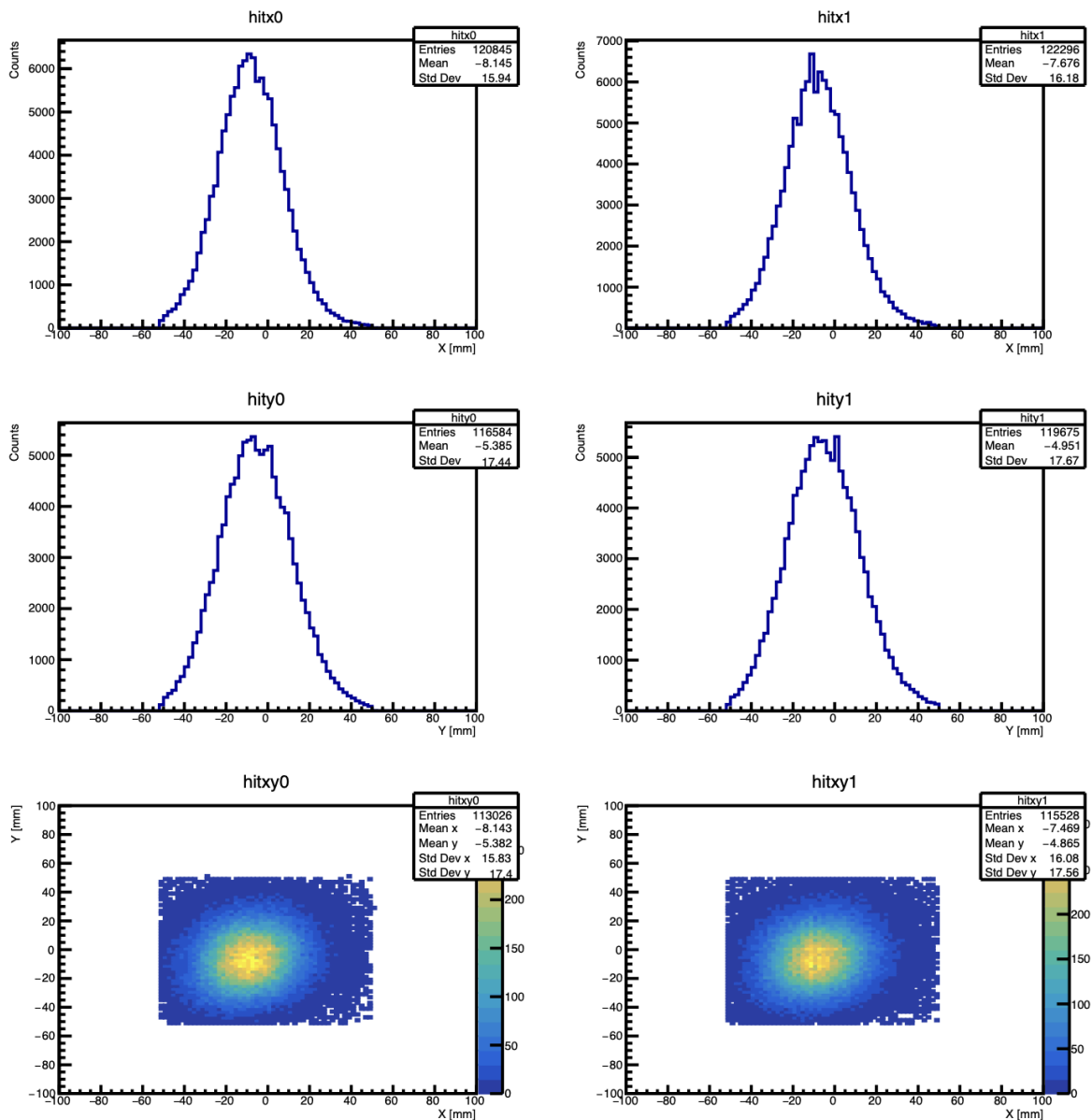
e+:



PID:



## tracker

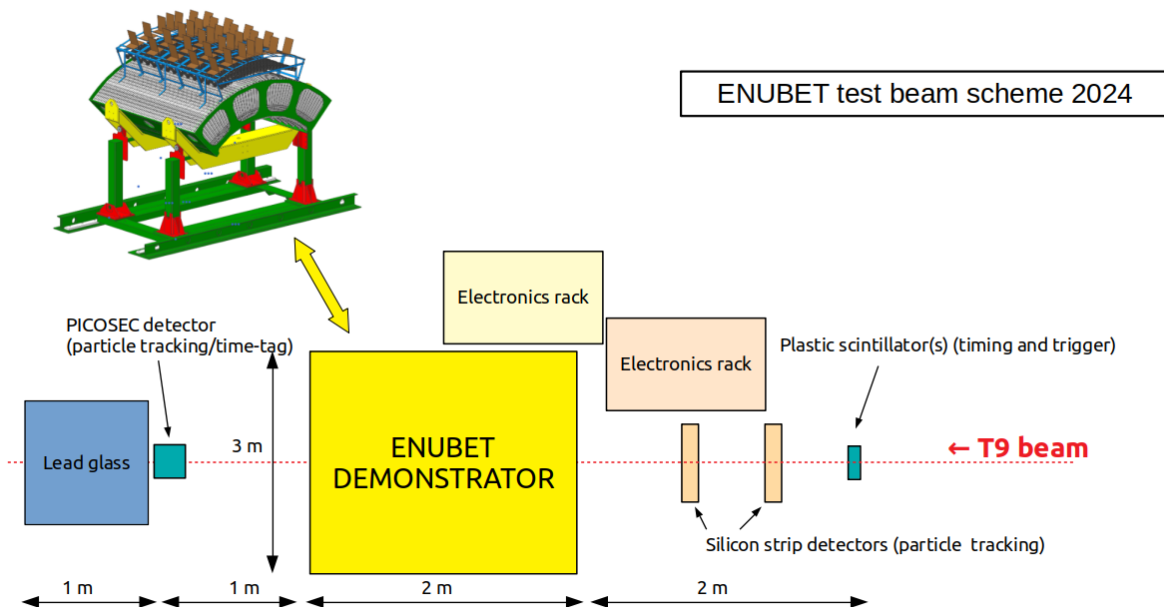


## T9 Incoming Main: NP06 ENUBET (Week 33) (Valerio Mascagna)

- 2 weeks (Wed 14 – Wed 29)
- test of the ENUBET tagger, a 3 tons iron-plastic sampling calorimeter
- Same as 2022 and 2023, but with full acquisition system for the first time and new darkening
- tagger shipped to CERN on Aug 1
- Installation ~ 1 day (Wed 14 morning -> Thu 15 afternoon)
- Safety clearance visit planned for Thu 15 at 16:00 (ISIEC 1363)



- Beam requirements as last year, (Neg. other, 1.0 - 5.0 GeV/c, Neg. pure e, 1.0 - 5.0 GeV/c), reusing beam files
- Test of a novel detector (PICOSEC from RD51) at the end of the line (2nd week)



### T10 Main: ALICE ITS3 (Paolo Martinengo)

Data taking successful, we are happy and preparing for next slot

### T10 Main: EIC BARREL ECAL (Hwidong Yoo)

- install prototype detector yesterday and successfully take commissioning data yesterday
- DWCs (gas) has been installed today morning and cerenkov counter will be ready today
- After applying particle id and beam quality selection by cerenkov counters and DWCs, we will start more intensive physics data taking from today
- Many tests will be done for new Astropix chips

### T10 Incoming Main: ALICE TOF (Week 33) (Yongwook BAEK)

- Test xy-2D readout MRPC
- HV scan, position scan
- Use standard mixture & eco gas

### T11 No beam + Incoming Main: P349 (Week 33) (Vincent Verhoeven)

- installed set up

- safety mainly done (calculate CO2 leak)
- further tests of set up for full operation next week (e.g. data taking without beam)

### North Area Beam Status (M. Van Dijk)

On call number: **67500**

Target intensities

Original plan

T2	T4	T10	T6	from
30	75-85	55	30	02.08.
30	42	21	30	12.08.

New plan

T2	T4	T10	T6	from
30	100	52	30	08.08.
30	42	21	30	19.08.

H2: Good operation.

H4: Good operation.

H6: Good operation with higher rate last week. Thanks to EP PIXEL for sparing an hour or so for some optics checks and measurements.

H8: Mostly good operation, failure of beam stopper XTDV.042.572 (between H8B and H8C) leading to some difficulty. Can operate in mode dependent on PPE158 (access is simultaneous with PPE168) or always closed (no beam in PPE168) but changing it takes quite some work. For now closed on request of DRD6 IDEA DRC. Repair expected to require ~2 days.

P42 / K12: Major issue with P42 XTAX, causing 20 h of downtime to NA62. Mitigation found and way forward to be discussed further. Access via TCC8 access point requires stop of full North Area. Went to beam dump mode yesterday, including increase of T4 intensity to 100 units.

M2: Good operation. Issues with the 2nd MBPL magnet for NA64mu with cooling and power converter which was fixed.

**HIRADMAT (Please Put Your Name Here)**

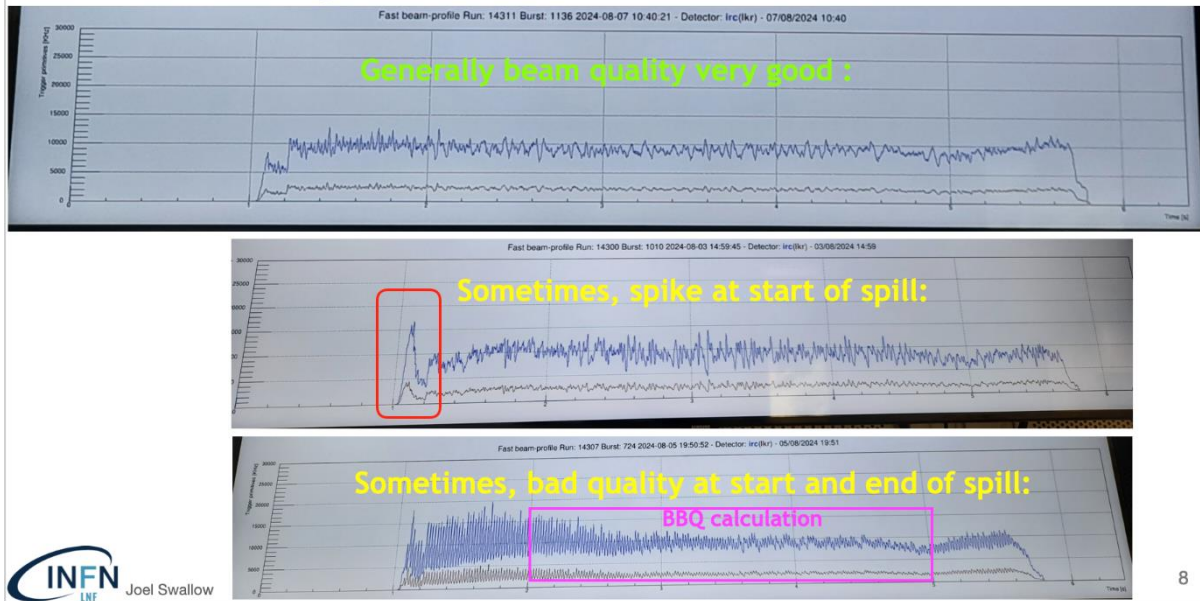
## North Area Users Tour de Table

### P42-K12:

#### NA62 (Week 33) (Joel Swallow)

- Kaon mode from end of TS to yesterday.
- P42 TAX issues meant a delay to resuming our data-taking after TS. Eventually re-started just after midnight on Saturday morning - thanks to Johannes and support from beam teams.
  - Note: P42 magnet BEND10 tripped Saturday morning and again yesterday evening.
- Kaon mode data-taking was generally very smooth ( $\sim 4 \times 10^{16}$  POT on T10,  $\sim 18300$  good spills recorded on tape by NA62).
  - Thanks for generally excellent quality of beam! The weekend was a near ideal set of conditions for NA62!
  - Some rare instances of a spike at the start of spill or 50/100Hz especially at  $t < 2s$  or  $t > 5s$  (see pictures from our run meeting below), thanks to operators for addressing these issues when we called.
- Switched to Dump Mode yesterday afternoon (thanks again to Johannes & Lau et al. and all at SPS for organising and realising this change so effectively)
  - Now operating with  $\sim 50 \times 10^{11}$  protons-on-K12TAX per spill.
  - Special magnet settings to ensure best muon sweeping - following a scan to help derive optimal and calibrate POT measurement.
  - Plan to remain in dump mode until Monday 19th.

# Beam Quality



**M2:**

**Main: NA64mu (L. Molina Bueno)**

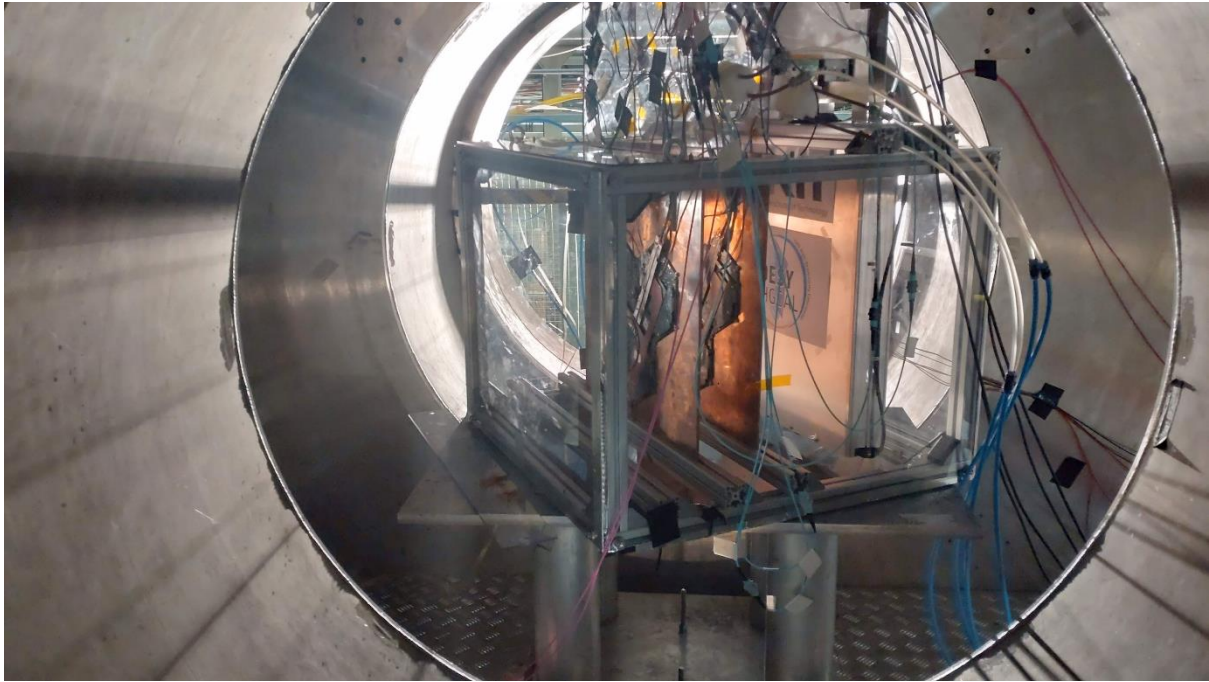
A brief summary is updated to the Indico. We resume our activities after the long stop that lasted until Friday in the end. Saturday we finish calibrations and set up our trigger and Sunday evening we manage to start data taking. We lost other shift on Tuesday due to a problem with the cooling of the MBPL magnet used in MS2. We adjust the beam on Tuesday after the magnet was repaired with Dipanwita and we are currently recording data.

**H2:**

**Outgoing Main: CMS HGCAL (Chiara Amendola)**

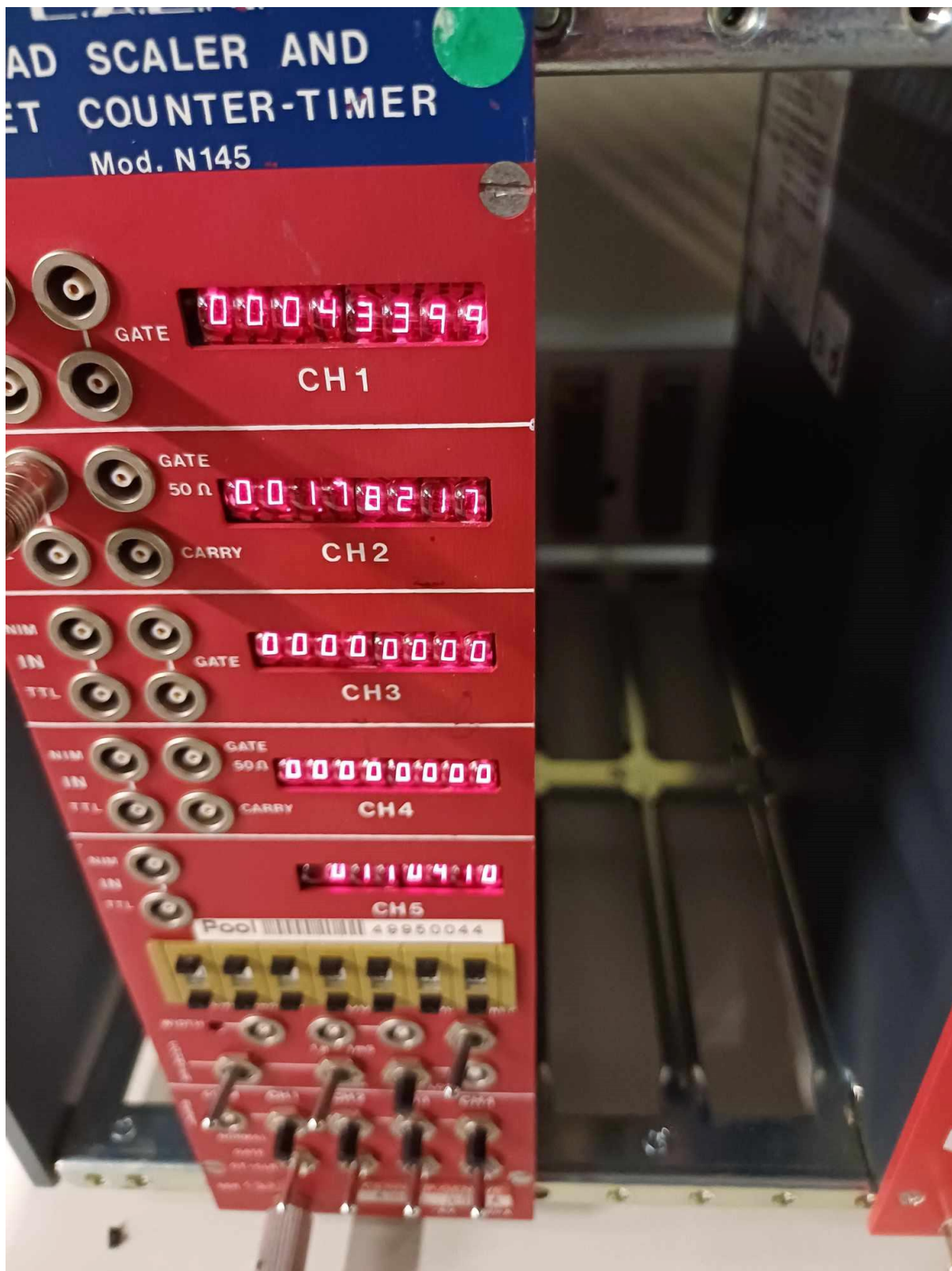
- Detector consisting of 2 layers of silicon modules and 2 of scintillating tiles with close-to-final readout (front-end and back-end)
- Installation in the M1 magnet (1 week off beam + 1 week main H2 users)
  - We took data with and without beam (electron and muon) with multiple rotations of the detector box in the B field
- We will have another 2-week slot in september: test of newer version of the modules and updates of the back-end firmware
  - Part of the equipment is still in H2, out of the way of the upcoming users

Thanks to everyone for the support!



**Main: CMS HF (Alexi Mestvirishvili)**

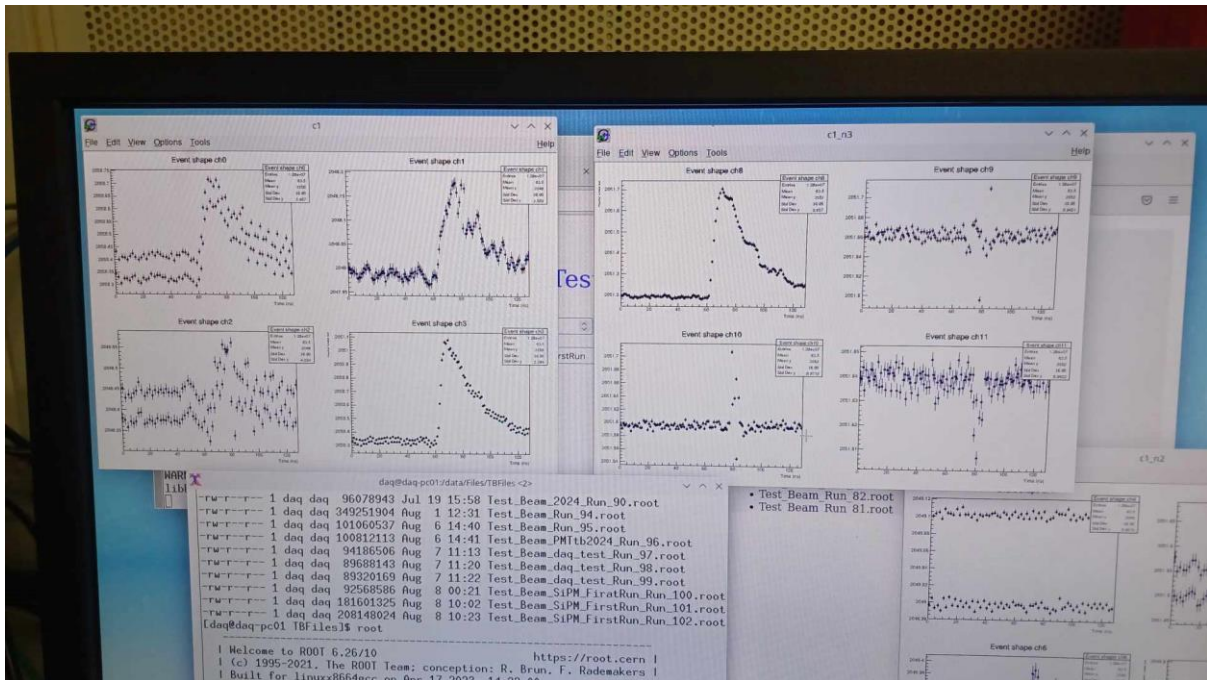
Started installing our setup August 7th, transition from HGAL to HF was very smooth! Beam is greit. We are busy with alignment and then we will be asking Nichos to help in beam adjustment, but overall beam is perfect



! our beam counters



We saw first signals from SiPMs

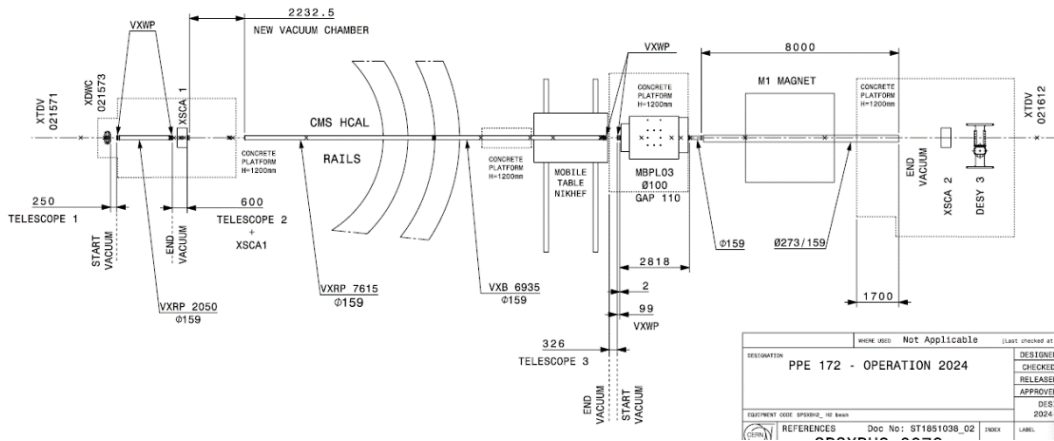


### Incoming Main: TECHNO CLS (Week 33) (Stefano Carsi)

- The installation is scheduled for **Wednesday, August 14th**. We are already in contact with the main users to collaborate in the area and manage the materials they leave inside the area during our beamtime.
- An access to PPE 134 for approximately **half an hour** was agreed upon with the NP04 team to move 4 pallets of material inside PPE 172 using the **crane**. This will take place from **8:30 to 9:00 AM** on Wednesday, August 14th, as no MD is scheduled.
- All relevant details about the experimental area have been thoroughly discussed with **Sylvain** on ASM. A warm thank you to Sylvain for his assistance.
- The goal of the experiment is to test an *undulator*, which is a **periodically-bent oriented crystal**, using a **20 GeV/c positron beam**.
- A special thank you to the **CMS team** working in PPE 172 in the weeks before us for allowing the CERN magnet team to **install the MBPL magnet** during their time, and for their willingness to find a compromise on the management of the experimental area.

### Experimental sketch

PPE172 2024  
WEEK 33  
TECHNO CLS



#### H4:

##### Main: NP04 (Christos Touramanis)

Smooth data taking since beam became available last Friday.  
Detector stable, nothing special to report.  
Continuing over the rest of our run.

#### H6:

##### Outgoing Parallel: ATLAS ITK PIXEL (Andre Rummler)

Little progress on communication problems with ITkPixV2 quad due to lack of person power. Setup dismantled and removed by 1100 and prepared for HGTD (TLU2, FE-I4 retune, etc.).

##### Outgoing Main: EP PIXEL (Dominik Dannheim)

- Efficient high-rate data taking (up to  $\sim 4.4E6$ /spill in scint. 532), but beam only from Saturday early morning to Wednesday morning.
- Shortened measurement programme due to reduced beam time: testing of thinned (30 microns) H2M pixel-detector demonstrator for various operation parameters; rotation scans postponed to next beam period.
- Few test runs (telescope only) on Wednesday morning with different beam optics for smaller focusing (project of Laurie and his summer student Luke Weaver), to be continued.
- Plan for iterative telescope re-alignment with a few test runs this afternoon, in parallel to ATLAS HGTD data taking. (No other users currently in H6B.)

##### Main: ATLAS HGTD (Stefano Manzoni)

Sorry but I am not able to connect because we are running a test right now.



Two weeks of testbeam started yesterday: main goal is measuring hybrids (ASIC+LGADS) performances before and after irradiation.

- Installation done yesterday morning, and safety check passed in the afternoon.
- Today: finalising the DAQ setup, calibration of the DUTs. We expect to start real data taking in the afternoon.

**H8:**

**Outgoing Parallel: LHCB (L. Martinazzoli)**

Successful week of data taking for the LHCb VELO TimePix group.

- Time lost due to the H2 magnet replacement and the following delay was well compensated by optimal duty cycle over the weekend.
- Physics program completed, several Si sensors characterised.
- Issue with the TAX between PPE158 and PPE168 affected the downstream users (see NA report above).
- Good cooperation with the other users. No need to split the time. Thanks to CMS PPS for the collaboration!

Thanks to Maarten (and all the beam experts) for the support!

Looking forward to being back in weeks 42-43!

**Outgoing Main: CMS PPS (F. Garcia)**

This week as Main user was interesting. The start was difficult, however during the period things converged slowly and the physics program was almost completed.

The beam characteristics were as requested, however once the all the setups upstream were installed the beam was broadened on both planes as we expected however larger than what we wished. In the H8C area turns out to be very difficult to have a narrow beam and this is a fact.

The Beam physicist have done all possible to satisfied our requirements in terms of the beam characteristics and we got a good one. The intensity was varied during the whole week, starting with 17k/spill then 37k then again beack to 17k and last day 147k (the best).

The Diamond detectors were tested with different types of LED diodes: Red, Green and Blue. We expect for the next test beam to test Yellow and white.

The data analysis is ongoing...

Actions requested:

For what was formerly known as the TOTEM CR, we would need a repairment of the beam control computer H8C2 and for the H8C3 the second monitor/TV to be replaced.

All the team would like to thank to all the crews in the NA. Everyone was reachable and their actions were taken just after reporting them, even during the weekend.

**Main: QFIB (Please Put Your Name Here)**

**Parallel + Incoming Main: DRD6 IDEA DRC (Week 33) (Seungkyu, Gabriella)**

DRD6 IDEA DRC Korean team and EU team are working together.

- Korean team has completed module unpacking and are currently in the process of module assembly and DAQ system installation.
- EU team is installing auxiliary detectors and performed alignment of the auxiliary detectors (geometry setup).
- For patrol training, we completed yesterday.
- For week 33, we will be main user. We submitted ISIEC form for next week and requested safety check Aug. 14 4:00 PM. And patrol training will be arranged next week.

**Parasitic Users**

**H6: ATLAS MALTA (Please Put Your Name Here)**

**H6 Incoming: CMS MTD ETL (Week 33) (Please Put Your Name Here)**

**H8: STRAW TRACKER RD (Please Put Your Name Here)**

**H8: QFIB (Please Put Your Name Here)**

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**AoB**

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