

# PS-SPS Users Meeting for Week 26 held on June 27th, 2024

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## Physics Coordination schedule:

- June 25th to July 7th: Martin Jäkel
- July 8th onwards: E. Barbara Holzer
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- 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.
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## News from the PS & SPS Physics Coordinator

E.B. Holzer, M.R. Jäkel

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- **User Schedules v2.0.3** (for most of the lines **until end of August**) released: see [User Webpage \(https://ps-sps-coordination.web.cern.ch/ps-sps-coordination/\)](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 \(https://edms.cern.ch/document/2872566/2.0\)](https://edms.cern.ch/document/2872566/2.0)  
2024 approved LHC schedule [EDMS 2872429 \(https://edms.cern.ch/document/2872429/2.0\)](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

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Reminder: Beam time exceeding the limits of 2 weeks PS beam time and 1 week SPS beam time (added proton and ion beam time!) per year need the approval of one of these CERN committees: SPSC, LHCC, DRDC, INTC, RB or IEFEC. Consider joining a DRD collaboration, if you require more beam time.

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

- Inspection of water leak in booster, probably Monday 24.6. with beam stop at 7:30
- SPS magnet was exchanged because of a vacuum leak --> will require scrubbing in the SPS
- Water leak on quadrupole QNL.X021.049 has become worse. The magnet needs to stay off, which limits the beam momentum in H2 to 150 GeV/c until the magnet exchange.
  - **Exchange to be planned:** Possibly end of July / beginning of August.
  - H2 beam line momentum limited to 150 GeV/c until further notice

### Upcoming SPS MDs next weeks :

- W26 no MDs - NO access in BA80, BA81, and TCC8-ECN3
- W27 no MDs (HiRadMat) à NO access in BA80, BA81, and TCC8-ECN3
- W28 No MDs - NO access in BA80, BA81, and TCC8-ECN3
- W29 Dedicated: 17/7 → extraction MD - NO access in BA80, BA81, and TCC8-ECN3
- W30 Dedicated: 24/7 → extraction MD - NO access in BA80, BA81, and TCC8-ECN3
- W31 access for QNL replacing from Tuesday 8h up to Thursday (afternoon depending on the progress) - Access OK in BA80, BA81, and TCC8-ECN3

## PS Machine Report (R. Garcia Alia)

- Thursday-to-Thursday availability: 92.8%. Main downtime contributors:
  - PSB intervention for water leak check on QDE11
  - PS access for C10-46 amplifier fan replacement
  - Issues with TT2 access system
  - Electrical network glitch
  - EAST: Some issues with magnets (mainly due to water cooling) and requiring First Line intervention
- Beam adjustment and preparation:
  - MTE in bad shape after PSB access - issues with H16 barrier controller hardware, solved through NIM crate module reboot (Mon)
  - T8 steering with new optics, after adjustment for 12 x 12mm on BPM2
  - Progress on MTOF
  - Progress on high-intensity parasitic TOF (BIGTOF)
  - Preparation of HIRADMAT beam for next week, to be tested in SPS on Friday

## SPS Machine Report (M. Schenk)

- Availability: ~75% NA (Thu - Thu)
- Main downtime due to water cooling issue
  - Tue PM: coil overtemp. tripping main magnets 2x
  - Access showed that MBA 31590 water cooling circuit blocked
  - Unblocking attempted by EN-CV and magnet experts had to be aborted at 2:30 AM.
  - Wed: repair during daytime
- Today
  - Now: access due to potentially important water leak in BA3
  - Long parallel MD
- Friday
  - HRM test: 08:00 - 13:00 (SFT in parallel)
- Other items
  - NA: monitoring spill harmonics; also following up more closely with EBC parameter
  - LHC: extraction orbit check / adjustments needed at SPS; potentially Friday PM after Hiradmat test.
- Next week: Hiradmat 2 run

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

- Reminder for ISIEC requests next week.

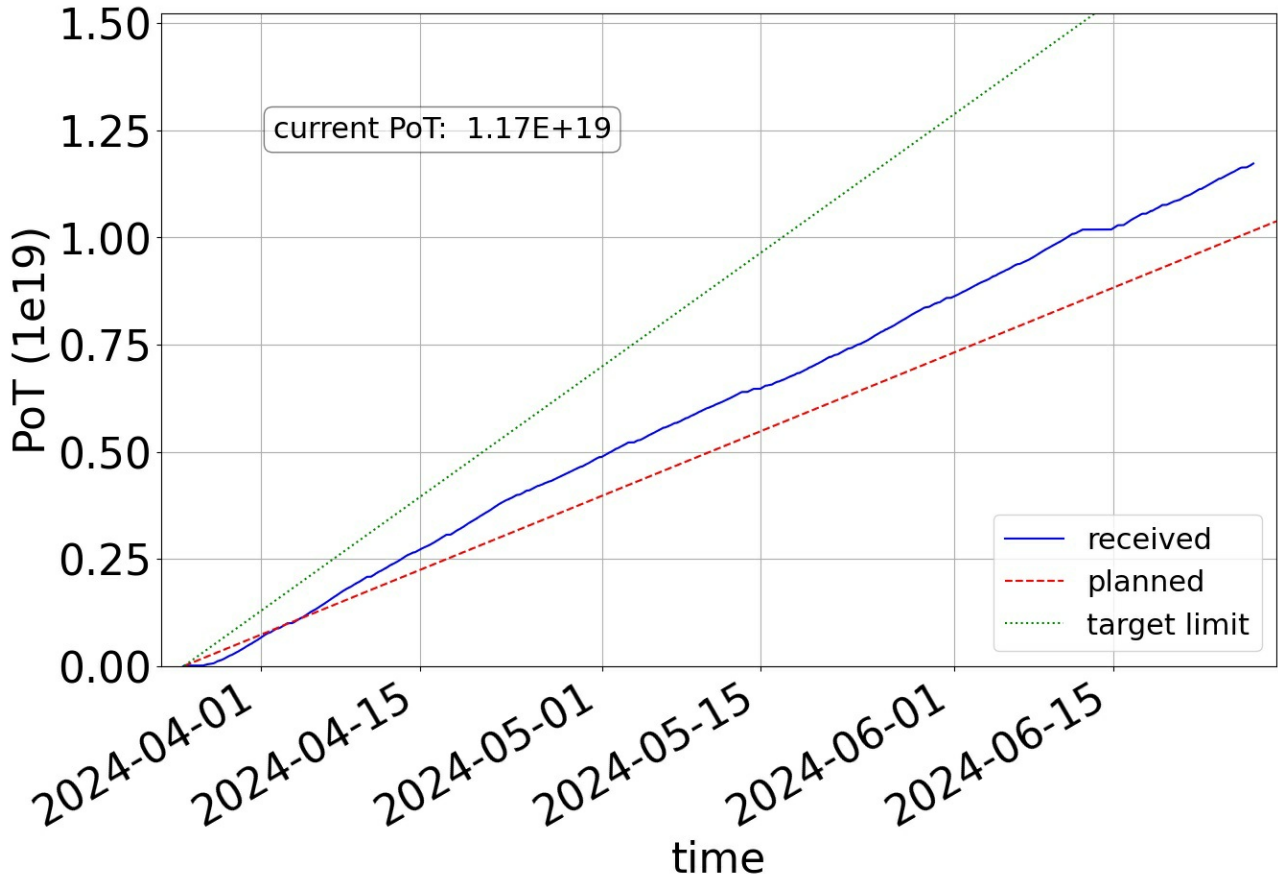
## **nToF (M.Bacak and P.M.Milazzo)**

Smooth restart of measurements after technical stop.

Data taking on Er(n, g) in EAR! and activation measurement in the NEAR.

From 26.06 a vacuum issue has been observed in the beam monitor scattering chamber in

EAR2. Problem under investigation by vacuum experts and Mo(n, g) measurement put in standing mode.



## East Area Beam Status (B. Rae)

Yesterday late afternoon beam drifted away from the T10 target. PS OP wasn't available to look at it and started to investigate only during the night. Beam was completely unavailable to T10 from 17:45 to 01:45.

On call number: 67500

T09: Beam to be checked with Calice today.

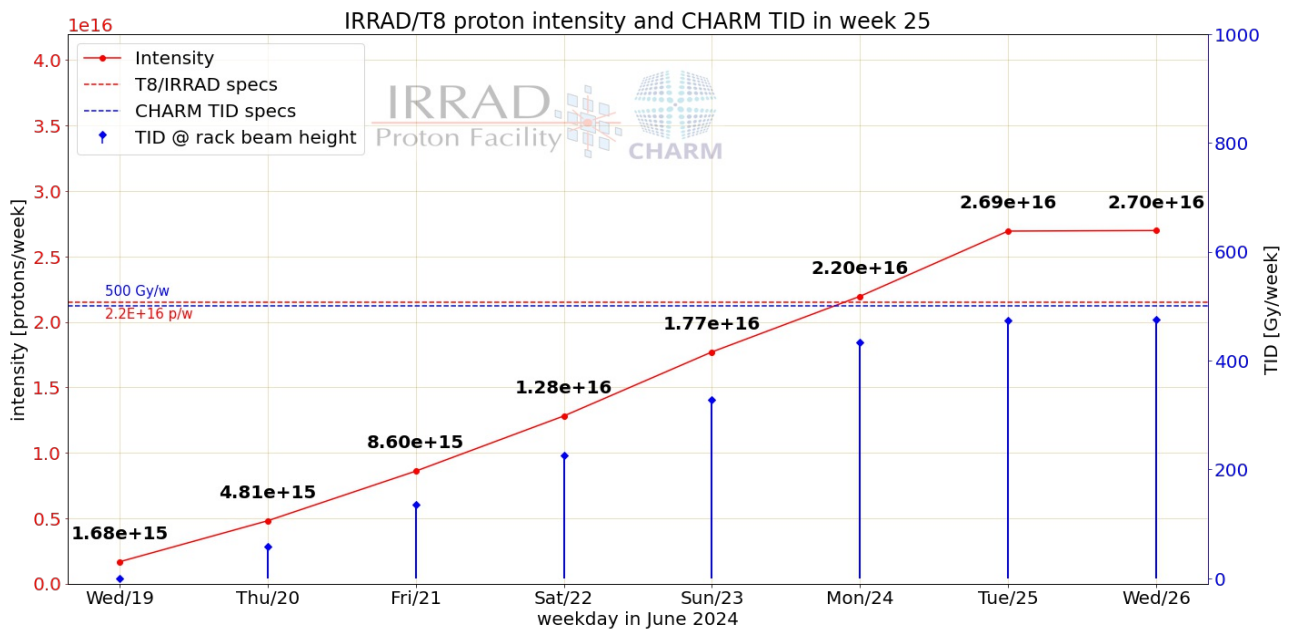
T10: Good operation - issue with steering on target as mentioned before.

T11: No user.

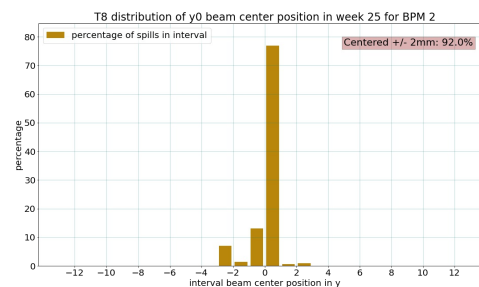
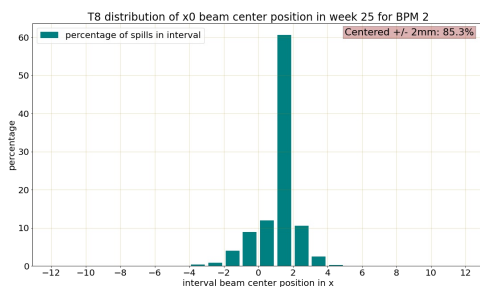
## East Area Users Tour de Table

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

Very good week. Cumulated  $2.7E16$  p/w and the TID required by the current users in the CHARM area. In these weeks we have users in IRRAD that require a wider beam spot ( $\sim > 12\text{mm} \times 12\text{mm}$  FWHM) than what we used since the beginning of the year, so we requested CCC to tune our optics. This is now achieved for BPM2 only and it would be good to have a beam configuration with a homogeneous larger beam-spot along all the line.



As observed also by some of the the operators, during these last weeks, the beam center tend to drift more often and with larger magnitude than at the beginning of the run. This also visible from weekly statistics below (~85% of spills centered on the X-axis in w25, compared to more than 95% in average until w23) and in BPT plots. These fluctuations (also seen in the other EAST beams steered on target) are larger that the corrections that the autosteering tools being developed lately can possibly compensate. This seems to be a "recurring" issue (observed also in previous years, at least for T8) that require furhter investigations.



During the access on wednesday: (1) In CHARM we removed setups by ATLAS and TE-MPE, and installed new by BE-CEM and SY-EP. (2) In IRRAD we exchanged samples for iFAST, ATLAS and CMS-BRIL while all other long-term experiments continue. We also succesfully tested the new MWPC to be integrated to the IRRAD tables in Zone 1 for the ion (HEARTS) run.

Next Wednesday we have a joint ASN/OFSP official visit in IRRAD and CHARM to observe the operation of the EA Irradiation Facility for which we submitted all our Safety Files in September 2023. Access is expected to be longer than usual. Before the end of the week we will ask to roll-back to the standard optics (smaller beam-spot) and we will request reduced intensity for the needs of a CHARM experiment and to reduce the activation of our zones before the visit.

## T9 Outgoing Main: OREO (Stefano Carsi / Nicola Canale)

- Due to the internal weeks swap, the **e+BOOST beamtest** was performed this week
- The quality of the beam was very good and allowed us to collect enough statistics for characterizing two different **crystal** samples to be employed in a crystal based **positron source** design

- Indeed, when an electron beam increases within a **small angle** with a crystallographic main axis/plane, an **increment** in the radiation or positron **production** is observed
- A **mirror** was **installed** in the T09 experimental area on the wall on the T10 side to ease the **alignment procedure** of our crystal like in PPE128
- A special thanks to
  - **Aboubakr** for all the support inside the experimental area, providing us everything we requested
  - **Inaki** for lending us a couple of plastic scintillators, to experimental measure the positron emission, as foreseen by simulations
  - **Dipanwita** for the assistance about the beam and beam files
  - All the **CERN staff** for have made possible our beamtests

## T9 Main: CALICE (Yong Liu)

- Preparation status
  - Crystal calorimeter prototype assembly done
  - Safety inspection done
  - Moved in to beam area and started to take muon data
- Planning
  - Muon beam data for MIP calibrations
  - 1-5 GeV electrons for EM shower studies
  - Extra (to be decided later): electron beam (<1GeV) for low-energy performance studies

## T10 Outgoing Main: ALICE TOF (Y.Baek)

- 3 Low resistive MRPCs are tested at high rates ~ 150kHz/cm<sup>2</sup>
- Data at 1,5 and 10GeV of beam energies
- Moved out after TREC measurement

## T10 Main: ALICE TIMING (Manuel Colocci)

- Setup installed yesterday and aligned this morning (when we had stable beam) -> now taking data

## North Area Beam Status (B. Rae)

On call number: 67500

New eco-mode for magnets in H2/H4/H8. May appear that some magnets are at 20A - not to worry.

Magnets exchange for H2 QNL leak has be schedule for the 30.07 up to 01.08.

H2: Smooth operation (beamline limited to 150 GeV/c)

H4: Smooth operation.

H6: Good operation. Only one brief magnet fault.

H8: Good operation.

P42/K12: We profited from the intervention yesterday in the SPS to investigate the P42 vacuum conditions.

An issue was found on a valve and was exchanged. Vacuum is back to standard conditions. M2: There was a quadrupole power supply fault yesterday which was fixed by the piquet. After the beam was back a 20% drop in intensity was observed which could be recovered with the collimators but the cause is being checked. It will be investigated today if this can be related to the intervention on the quad.

## HiRadMat

- Pre-comissioning slot 28.06 @ **08h00-13h00** - pulse list transmitted to the coordinators ;
- 'SMAUG-2' beam time starting **Monday 01.07 @ 08h00**.

## North Area Users Tour de Table

### P42-K12:

#### Main: NA62 (Francesco Gonnella)

- During beam time data taking was smooth, spill quality improved
- The power glitch that happened yesterday at 6am caused the failure of some vacuum pumps. This compromised the vacuum in on sector of NA62 decay tube. The vacuum was restored before the beam came.
- Last night at 1am we had a problem with a token (not properly inserted) in the access to ECN3 that triggered a patrol. We lost one hour of good-quality 3-spill beam. This is the second time that this happens.

### M2:

#### Main: AMBER (Thomas Poschl)

- Physics data taking with hydrogen target ongoing
- Very productive period from 21.06- 24. (3.8k spills per day) to finish 80 GeV/c run (15k spills in total)
- started 160 GeV/c on 25.06 (~10k spills required)
- change of beam after restart yesterday (not much of an issue atm as we started new period just before), issues with Quad18, currently under investigation
- plan to finish hydrogen measurements on the weekend and start switch to deuterium target (~1-2 days of switchover)
- will use the switchover period for further CEDAR measurements
- due to the delay we have in the physics data taking, we currently discuss to move the high-intensity DY test to the first days of our PRM-test beam time in October
- would require additional effort (from us and from BE) but would increase the probability of a successful physics run dramatically (4 more beam days)

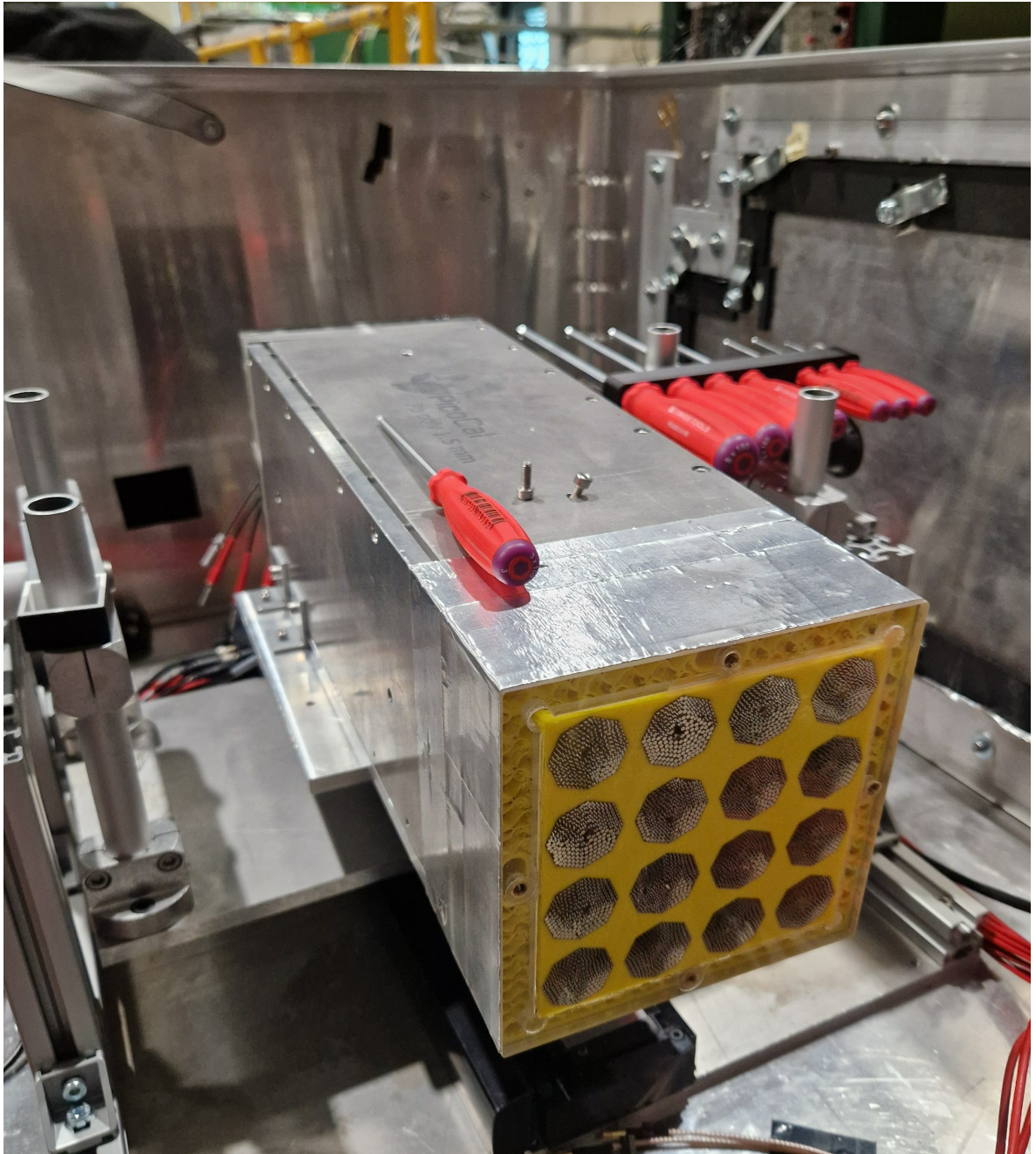
### H2:

#### Main: LHCb ECAL (L. Martinazzoli)

- Shashlik program unfortunately cut short by issues with the beam.
  - Hopefully continued at the end

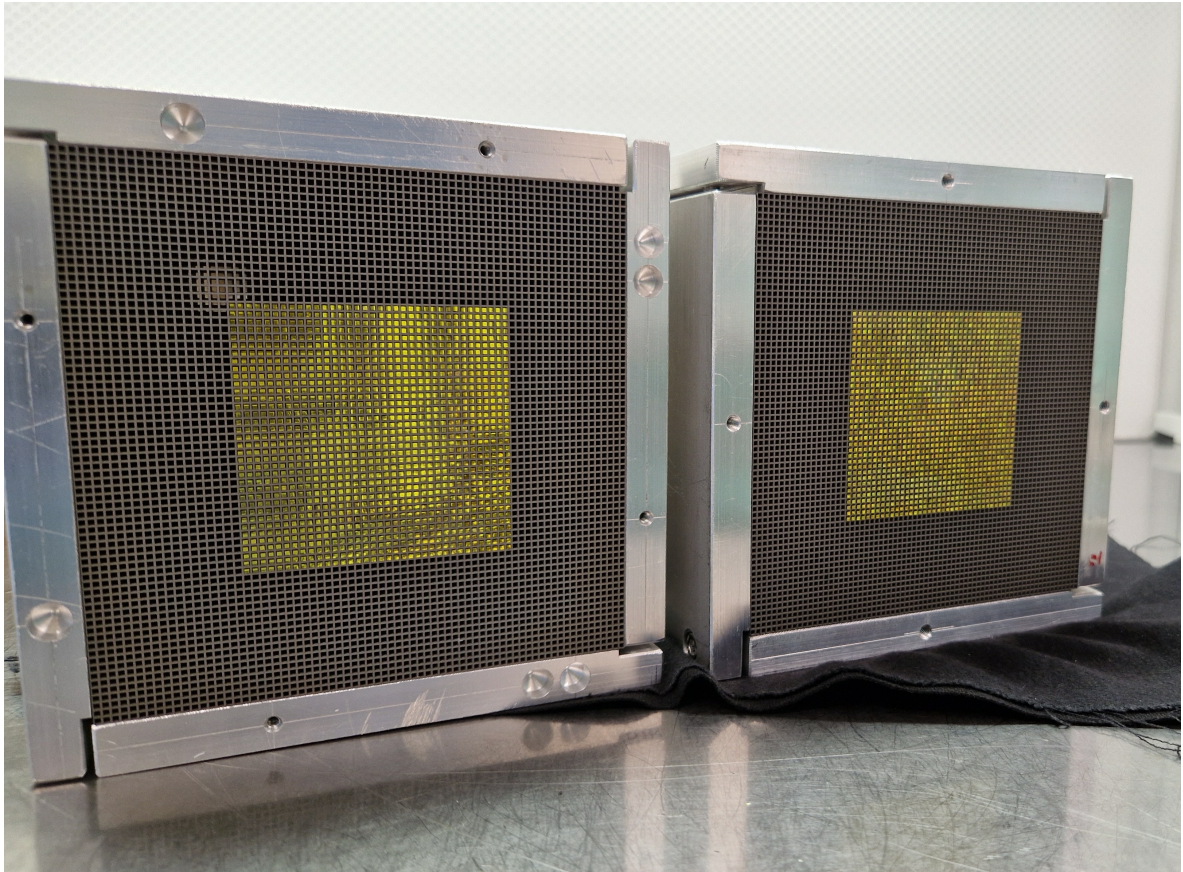


- Extensive program with SpaCal Lead absorber - Polystyrene fibres (To be installed in LS3)



- Now switching to SpaCal Tungsten absorber - crystal fibres (To be installed in LS4)





- Sunday to Tuesday left for dedicated studies on photodetectors, light guides and electronics.
- Beam parameters are ok for us.
- A huge thank you to Nikos for his constant support, even during the weekend.

#### **Incoming Main: NA61 SHINE (Week 27)(Piotr Podlaski, Bartosz Maksiak)**

- We will start the run on Wednesday 3rd of July
- Some installations already done during TS
- Running with 120 GeV/c protons and long DUNE prototype target
- Needed infrastructure (already agreed with respective departments):
  - 2 additional DWCs, as last year
  - CEDAR - W
  - vacuum modification in PPE152 to accomodate long target

#### **H4:**

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

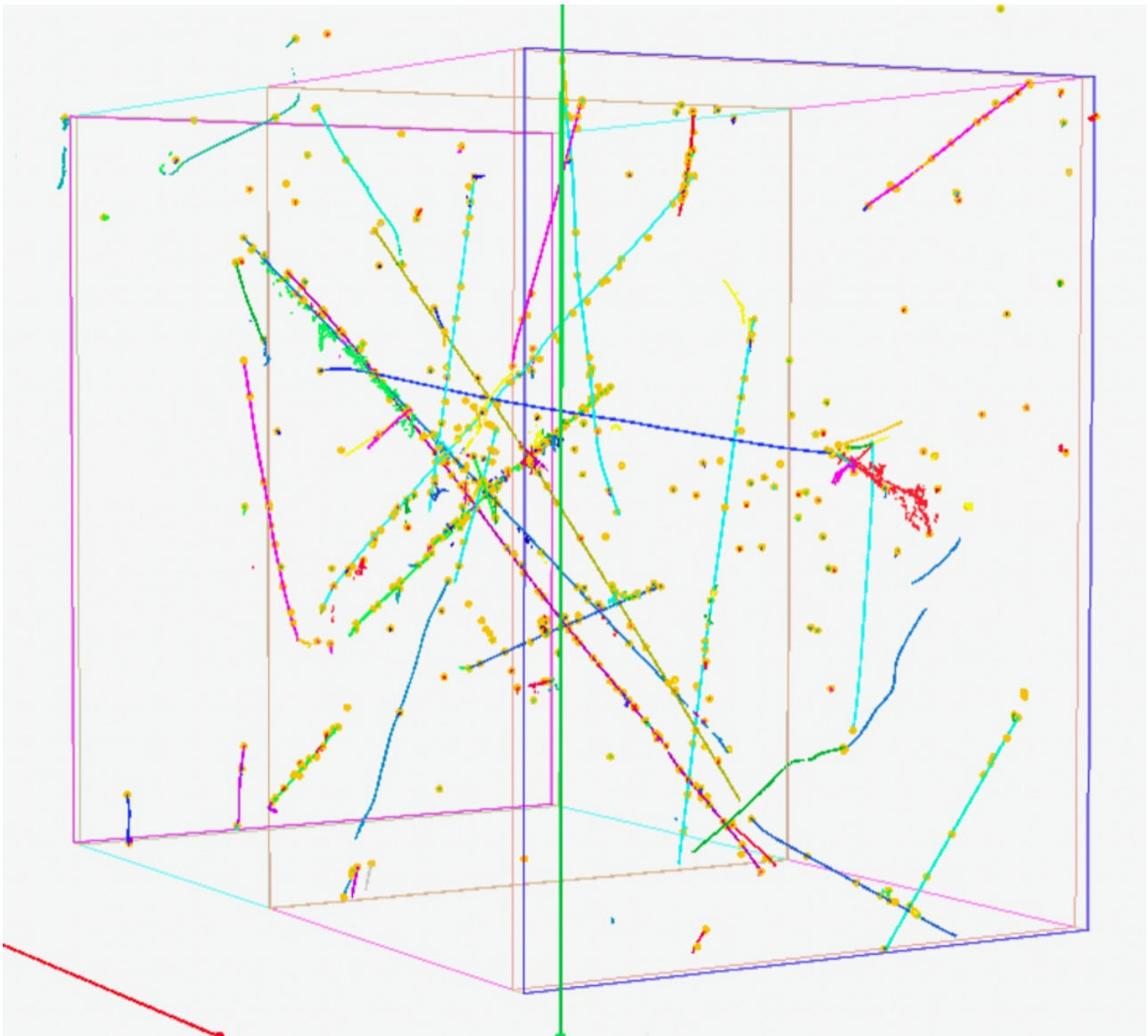
Beam from Wednesday 19th 18:30 to Tuesday 25 around 5pm. Very little downtime, very satisfied NP04 user, thank you!

Seeing very nice events in the TPC from first beam. Very smooth operations 24/7, no downtime from DAQ, HV, or any other NP04 source. Used various prescales in the DAQ above 3 GeV. Events reconstruction ongoing, working to adapt to the particular APA1 condition.

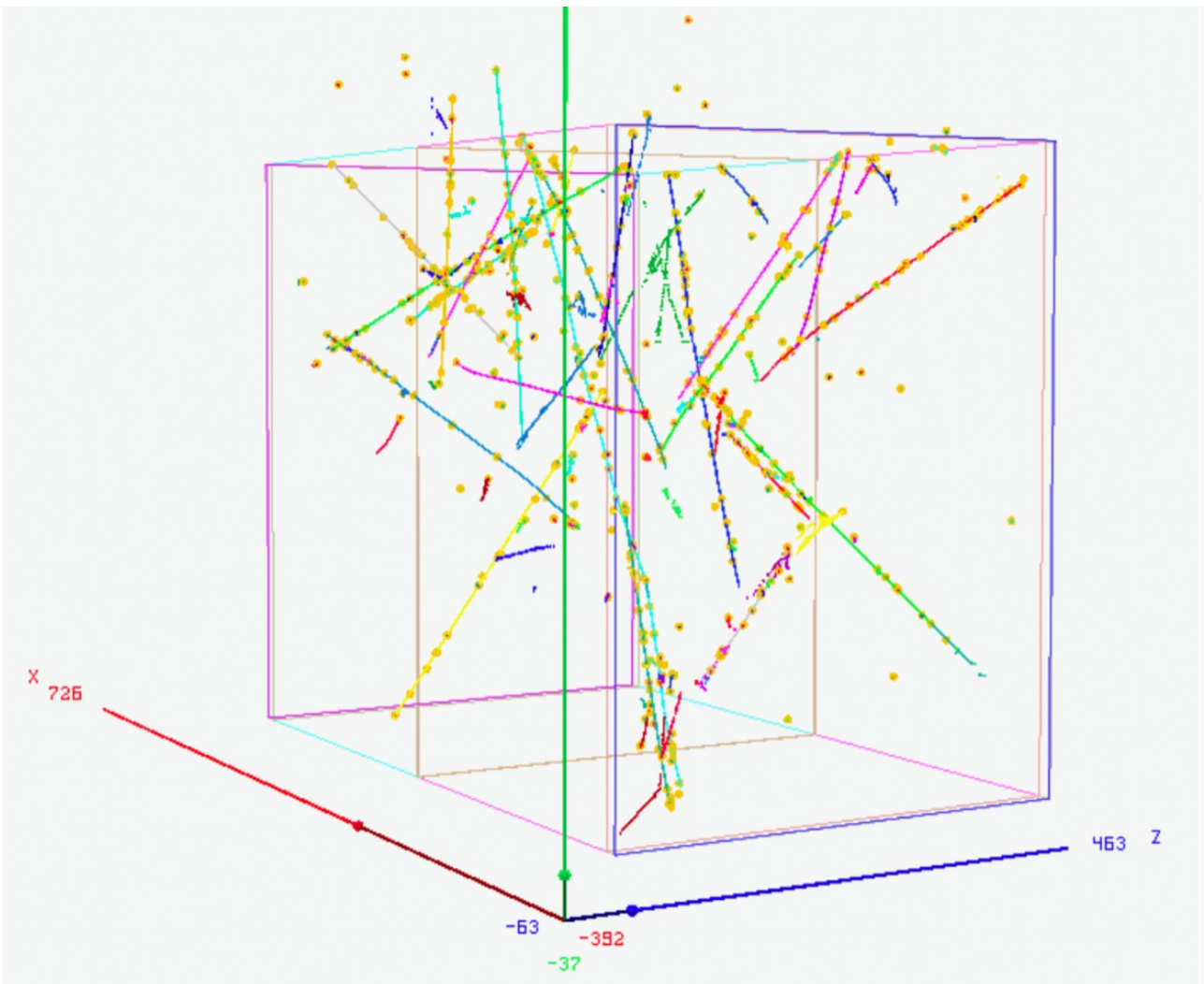
Main issue: one of our beam Cerenkovs fixed and working well, the other one still not working after a few interventions by the experts.

For next beam period:

1. Continuing detailed tests for grounding, around 1Hz noisy events, close monitorign of voltages and currents etc
2. Development work on our second laser system (tracks from the firs tone seen before the beam)
3. DAQ implementing improvements to increase event rate

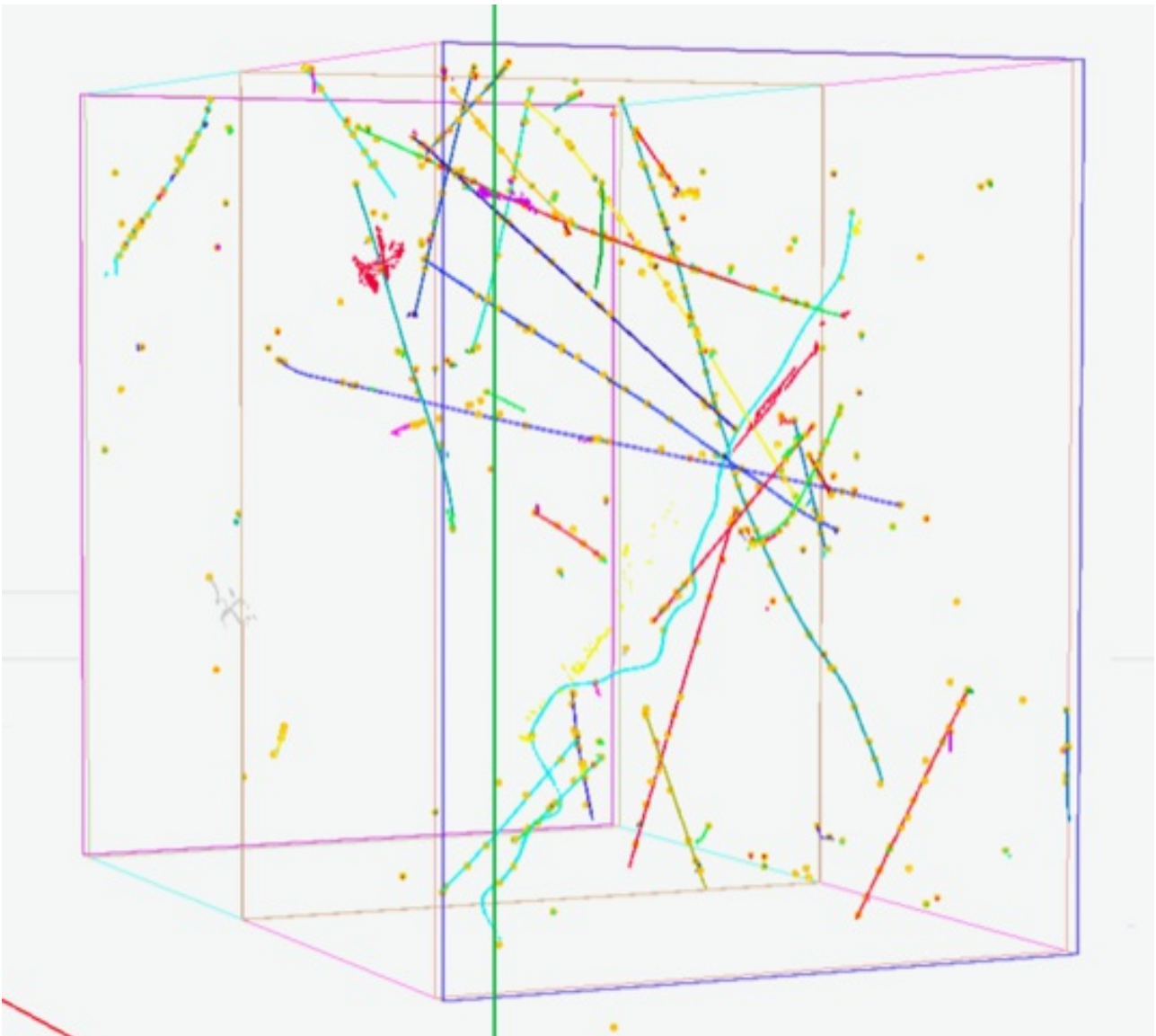


7 Gev pi+ traversing 4m of LAr and interacting near the TPC end



1 GeV muon stopping in the TPC, first negative particle seen in NP04 ever





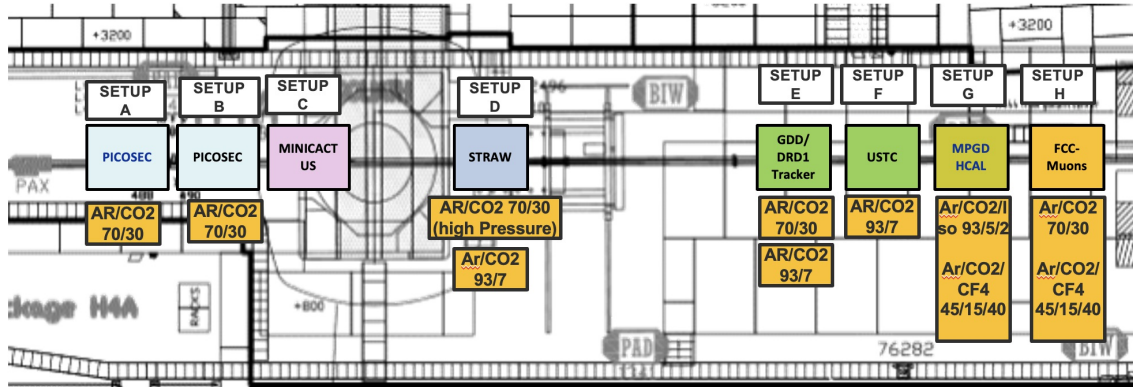
7 GeV mu- traversing the TPC

**Main: DRD1 (Yorgos Tsiopolitis)**

All setups (but one) are installed and ready to take data. One setup (FCC-muons) had some unforeseen delays and will instal next week.

Minicactus & straws are also installed and ready for data taking.

# BEAM H4, PPE134 – INSTALLATION (DRD1 , June 26 – July 10)



- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li>• SETUP A, B: PICOSEC (F. Brunbauer, M. Lisowska)</li> <li>• SETUP C: MINICACTUS (P. Schwemling)</li> <li>• SETUP D: STRAW (T. Enik, K. Kuznetsova)</li> <li>• SETUP E: GDD/RD51 Tracker (K. Floethner)</li> <li>• SETUP F: USTC (Y. Zhou)</li> <li>• SETUP G: MPGD HCAL (L. Longo, A. Pellecchia)</li> <li>• SETUP H: FCC-muons (G. Cibinetto)</li> </ul> | <p><b>UPSTREAM PANEL</b></p> <ol style="list-style-type: none"> <li>1. Ar/CO2 70/30 (A, B)</li> <li>2. Ar/CO2 70/30 (F)</li> <li>3. He/CO2 90/10 - 70/30</li> <li>4. Ar/CO2 [HP] 70/30 (C)</li> <li>5. Ar/CO2 93/7 (C)</li> </ol> | <p><b>DOWNSTREAM PANEL</b></p> <ol style="list-style-type: none"> <li>1. Ne-C2H6-CF4 (A, B)</li> <li>2. Ar/iC4H10 95/5 (G)</li> <li>3. Ar/CO2/iC4H10 93,5,2; Ar/CF4/iC4H10 88/10/2 (D)</li> <li>4. Ar/CO2 93/7 (F, G)</li> <li>5. Ar/CO2 70/30 (H)</li> </ol> |
|---|---|---|

## Parallel: GIF++ (Giuseppe Pezzullo, Paolo Martinengo)

Small issue yesterday related to an interlock "TIM=Interlock GIF++" applied on the H4 beam line. It applied a VETO2 on the GIF++ Cs source as well. After calling the EN-AA piquet, the issue has been solved. Investigation still on going why we had such a intelock on the line.

All setups installed and ready for data taking (including safety clearance), taken beam already last night

List of setups taking beam:

Downstream side:

- ATL-RPC
- CMS-CSC ME2/1 & ME1/1
- CMS Phase-2 GEM upgrade: ME0 station

Upstream side:

- ATL-RPC (MPI group)
- CMS-RPC T1 & T3
- ECOGAS collaboration
- EP-DT2

## H6:

**Outgoing Main: CMS PIXEL (Please Put Your Name Here)**

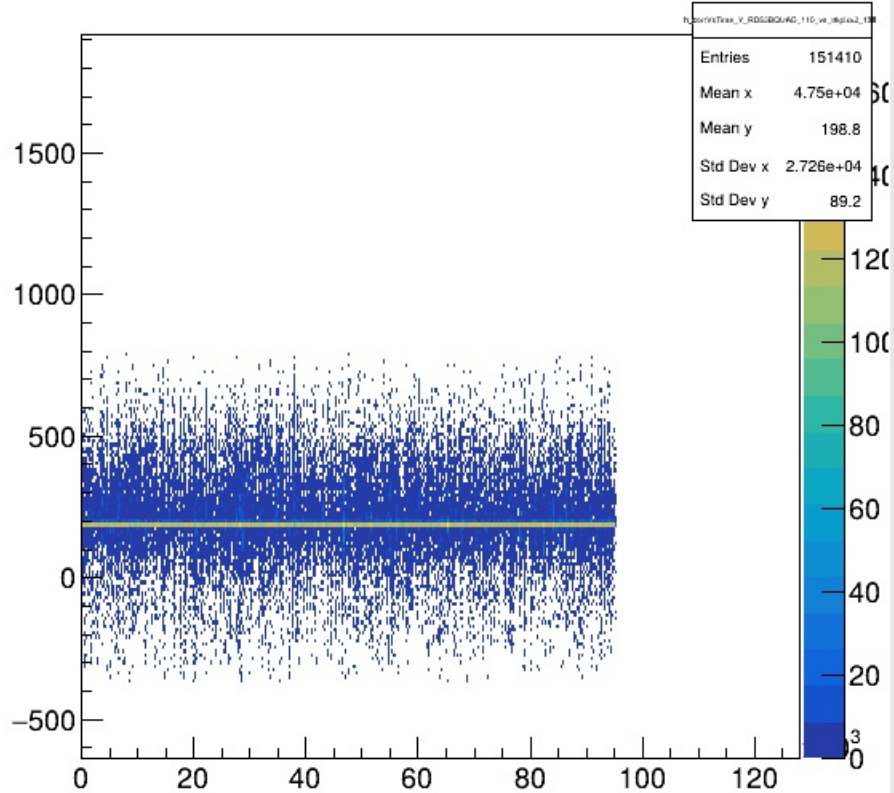
**Main: ATLAS ITK PIXEL (Andre Rummler)**

Work is ongoing, installed yesterday ItkPixV2 single chip module which works fine. Second YARR PC also set up yesterday works, now running with 3 Yarr producers. Now tuning ongoing. Likely swap of batch (no 3) in 2 days, tbd. New firmware/software working very well but development is ongoing slowly. Narrow l1dist, no unrecoverable desync, V2 working.



- MIMOSA26 1 in Y Vs Time
- MIMOSA26 1 in XY Vs Time
- MIMOSA26 1 in YX Vs Time
- MIMOSA26 2 in X Vs Time
- MIMOSA26 2 in Y Vs Time
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- MIMOSA26 5 in Y Vs Time
- MIMOSA26 5 in XY Vs Time
- MIMOSA26 5 in YX Vs Time
- Itkpixv2 130
- RD53BQUAD 150
- MIMOSA26 0
- MIMOSA26 1
- MIMOSA26 2
- MIMOSA26 3
- MIMOSA26 4
- Monitor Performance
- EUDAQ Monitor

Y CorrelationVsTime of RD53BQUAD 110 and Itkpixv2 130

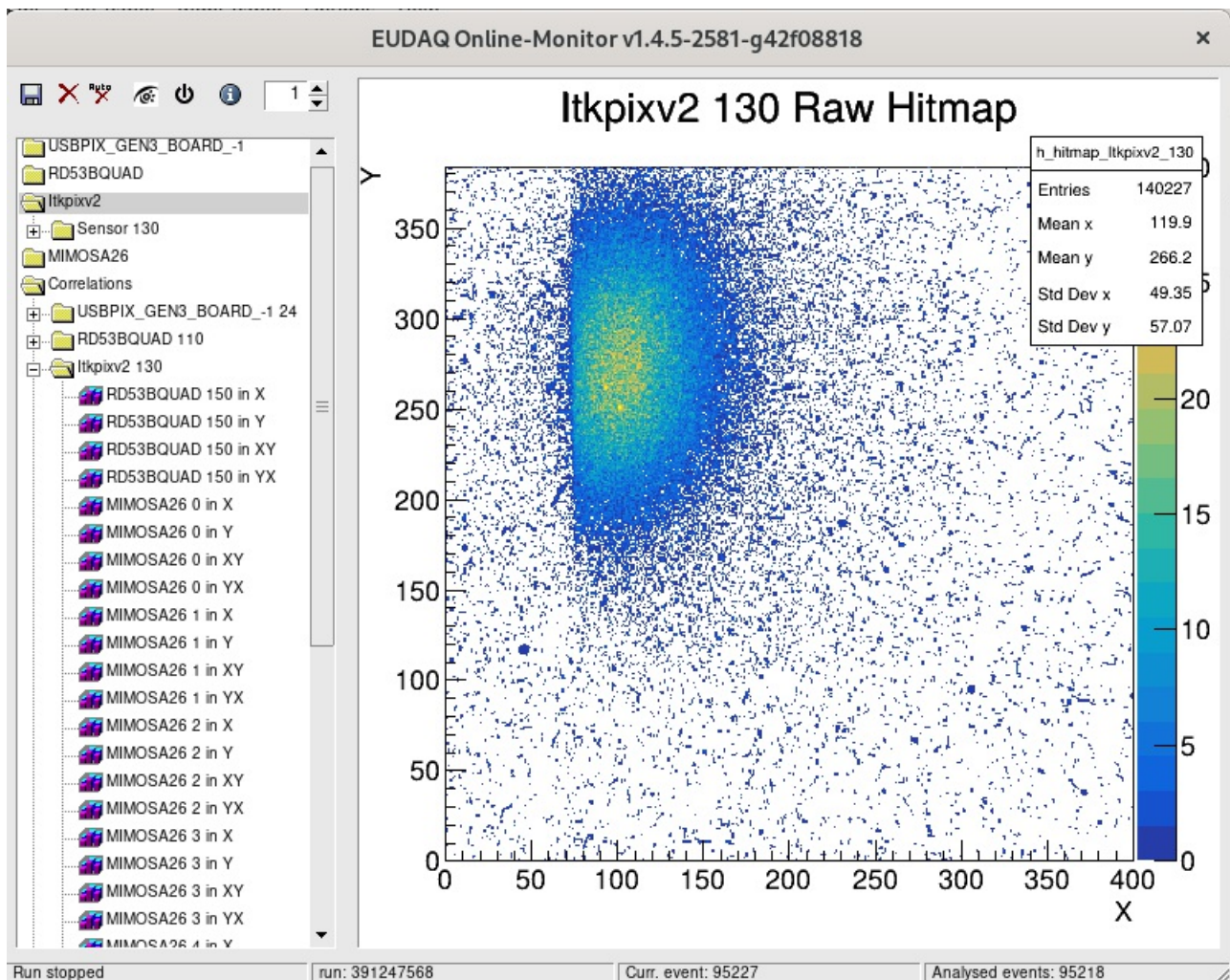


Run stopped

run: 391247568

Curr. event: 95227

Analysed events: 95218



### AIDA Telescope (H6B) (Andre Rummler)

I received note by Bransilav Ristic (CMS) that during their beam time plane 2 (third from upstream) stopped to operate (high current, no good JTAG, permanently firing destroying data taking) which required him to take it out of data taking. I replaced yesterday sensor 22 by the new sensor 313 and 6 planes are operational again.

### Incoming Main: POKER (Week 27) (A. Celentano)

Goal of the measurement: characterization of the POKERINO calorimeter (3x3 matrix of PbWO4 crystals with SiPM readout) with electrons, at different energies and intensities. Measurement of the detector linearity and energy resolution.

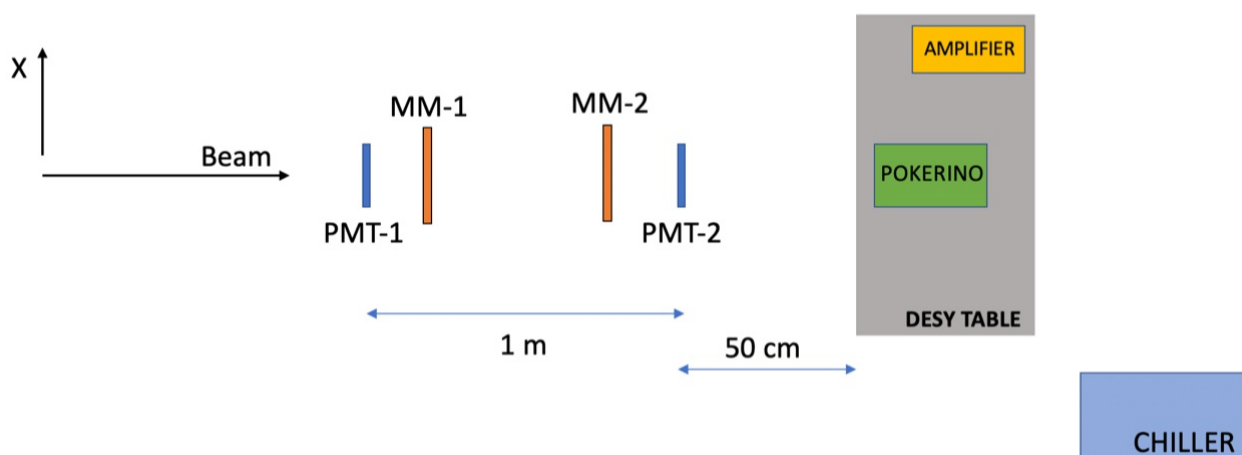
- POKERINO detector and mechanical structure already at CERN.
- Transportation of the remaining equipment (DAQ system) on July 1st. Total weight and volume very limited, will be handled by hands by the team (no crane support requested)
- Team members will arrive at CERN July 1st. All CERN accounts already setup, all safety courses already taken.
- Technical discussion with Michael Lazzaroni, Silvia Schuh-Erhard and Laurence James Nevey to define experiment needs in terms of infrastructure (DESY table, XCET, cables, patch-panels). All items have been defined.
  - Required gas for MM detectors ArCo2 at 1.05 bar - already discussed with CERN



gas team.

- Technical discussion with Laurence James Nevay to define beam configurations.
- ISIEC form already submitted.
- Installation on Wednesday 3rd morning in PPE146/e; safety inspection scheduled for Wednesday, July 3rd late afternoon.

Experimental setup:



## H8:

### Outgoing Main and incoming Parallel: UA9 and STI (Francesca Galluccio)

UA9 and STI took data smoothly last week until the magnet cooling problem on Tuesday. Yesterday, Wed. 26th, we changed the tracker configuration and we hope that this week we can take enough data to compare the 2 configurations. Yesterday we had also the alignment to the beam line of 2 new crystal alignment mirrors by the metrology team; Thank you! The whole interventions took 3 hours. We are more or less at 60% of the program.

### Main: PAN (J. Hulsman)

PAN is compact magento spectrometer, designed for deep space mission applications. We are testing a new sensor design (based on TimePix4) to improve the current design.

The principal setup is shown below.



Current status is a follows:

- setup build
- safety completed
- overnight data taken with a beam width of about 4cm x 4cm (roughly)



The planned data taking schedule is:

- 300um sensor (3 operating modes, different angles)
- 100um sensor (3 operating modes, different angles)

### **Parallel: UA9 (Please Put Your name here)**

### **Incoming Main: FASER NU (Week 27) (Ken Ohashi)**

The FASERnu is the sub-detector of the FASER experiment at LHC focusing on neutrino measurements. The main goal of this test beam is to understand performances of kinematical measurements of muons and hadrons.

- We will expose several emulsion-tungsten detectors
- Muon beams, (-50 GeV), -100 GeV, -200 GeV, -300 GeV
- Hadron beams -50, -100, -200, -300 GeV/c
- ISIEC form submitted yesterday.
- We would like to place our detector right after the wire chamber.
- We will install our detector on July 3rd morning/afternoon.

## **Parasitic Users**

### **H4: MINICACTUS (Please Put Your Name Here)**

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

### **H4: STRAW TRACKER RD (Temur Enik, Katerina Kuznetsova )**

- moved from H8 beam dump to H4, commissioned
- plan : measurements with extended reference tracking (started) and improved straw array (2nd week)

### **H6: CMS MTD ETL Federico Siviero**

- 2 telescopes with LGAD sensors: first one with 6 single pad prototypes, second with 3 full-size ETL LGADs (16x16, 4cm<sup>2</sup>)
- Start taking data tonight, acquired ~50% of the events we wish to have with this set of sensors, we will likely move to a new set by tonight.
- We will start using the telescope this afternoon, tomorrow we will start efficiency measurements
- Thanks A.Rummler for the help with the telescope and PI-stage

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## **AoB**

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