

PS-SPS Users Meeting for Week 20 held on May 16th, 2024

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Physics Coordination schedule:

- May 19th to June 9th: Martin Jäkel
 - June 10th to June 20th: E. Barbara Holzer
 - June 21th to July 7th: Martin Jäkel
 - July 8th onwards: E. Barbara Holzer
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- :::warning
- June 13th: User meeting exceptionally on zoom only (for availability of the conference room).
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News from the PS & SPS Physics Coordinator (E.B. Holzer, M.R. Jäkel)

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- **User Schedules v2.0.1** (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>
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

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Reminder: All 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) (M.Jäkel)

Upcomming MDs:

- Week 21: Dedicated SPS MD 22/5 (crystal shadowing) with beam extracted to North Area --> no access to ECN3
- Week 22: Dedicated SPS MD 29/5 (COLDEX, no extraction to TT20) --> access to ECN3 possible
- Week 23: no dedicated MDs (because of LHC MDs).

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Upcoming Technical Stop

- 12-15.06 : Intervention on Swiss power network. (Planned to finish Friday, with Sat. 15.06 as overflow day)
- Not the main supply for CERN, but electrical perturbations (high harmonic distortions) likely. Risk of trips on SVCs and filters for LHC and injectors.
- TI will confirm the end of the interventions and give go-ahead for restart

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PS Machine Report (Bettina Mikulec)

Availability of 96.9% Thu 9am - Thu 9am

Main issues:

- 1h40 downtime last Friday due to cooling issues of figure-of-eight loop
- 2 electrical network problems last Saturday
- POPS trip on Monday due to operational error
- Since yesterday afternoon losses occurred --> affected AD, SFTPRO for a short period and mainly TOF (slightly reduced intensity since) --> being investigated

Main progress last days:

- 4000e10 p reached for the first time yesterday for the barrier-bucket MTE MD cycle (although still with important losses in the machine)
- Mg ion beam injected and captured in PS; reached Flat Top yesterday
- Mg ion lifetime measurements with special flat bottom cycle yesterday

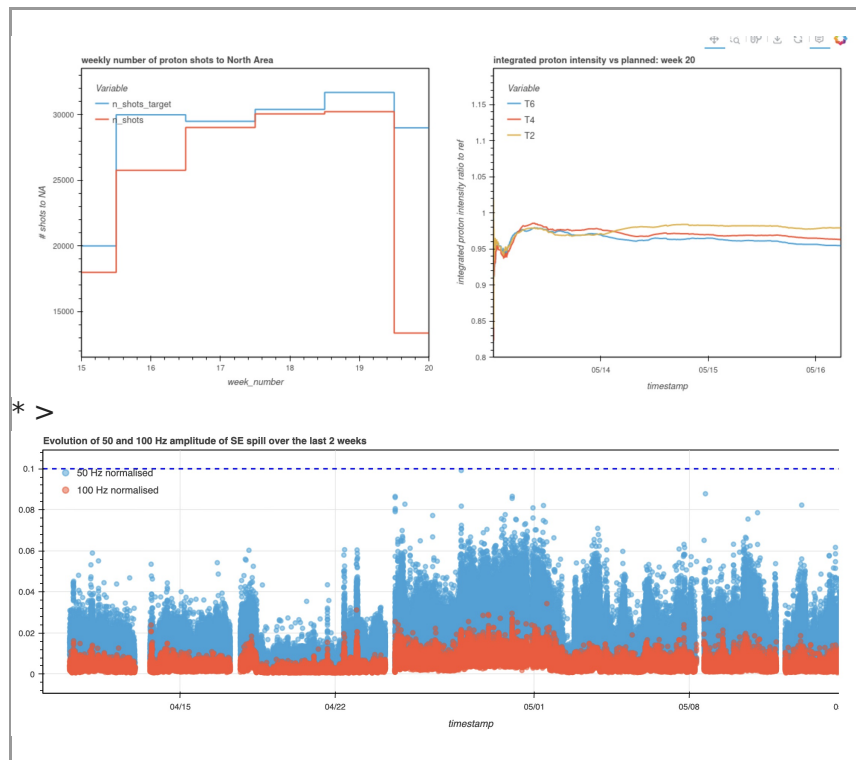
SPS Machine Report (Kevin Li)

![]

(https://codimd.web.cern.ch/uploads/upload_58fb16b87da730c8dcd4fa96b2ccac6c.png
=100x)



- Overview from last week:
 - Quite a few problems with our cavity 1 especially for the FT beams; did a rebalancing of the cavity voltages and are now quite close to the minimum required voltage; hope to survive like this until the TS
 - Otherwise running stably
- Status of this week:
 - LHCMDs took place and were completed successfully; switched to NA production cycles whenever possible (with 3 SFTPROs);
 - Conducted a small test yesterday to prepare for target switch next week; marginally increased intensity request as understood
 - Preparations needed for AWAKE and LHC BCMS beams; will be done for some time during Friday and/or the weekend
- Other news:
 - BPT should be back online
 - Noise suppression looks stable so far



Safety (J. Devine, EP Safety Office)

ISIEC submissions received in plenty of time this week, looking good for next week too - thank you!

Some notes/reminders from this week:

Derogations to the CERN safety rules can be issued by HSE for 'special circumstances', however these are generally in two categories:

1. Equipment which cannot comply with CERN safety requirements because of some intrinsic reason, such as cables in cryogenic liquids, which cannot comply with the cable rules. These are valid for the lifetime of the equipment/installation.
2. Temporary derogations (typically for lifting equipment) when equipment doesn't fully respect CERN requirements. These generally have a time limit, after which you are expected to bring the equipment into full compliance with CERN requirements. Any lifting table which isn't CE marked also requires a load test, to be coordinated with HSE.

The ISIEC clearance (<https://ep-th-safety.web.cern.ch/isiec-safety-clearance>) is valid for 3 weeks, if you need to operate for longer than this we have two options:

1. A follow up inspection, we can extend your clearance for another 3 weeks. Also applicable if you have made some significant changes to your installation.
2. Follow an alternative procedure (Initial Safety Declaration), which can be used to grant you a safety clearance for the entire run period. This is ideal for long term parasitic users. Get in touch with us (ep-adso@cern.ch) if you would like to do this for your experiment.

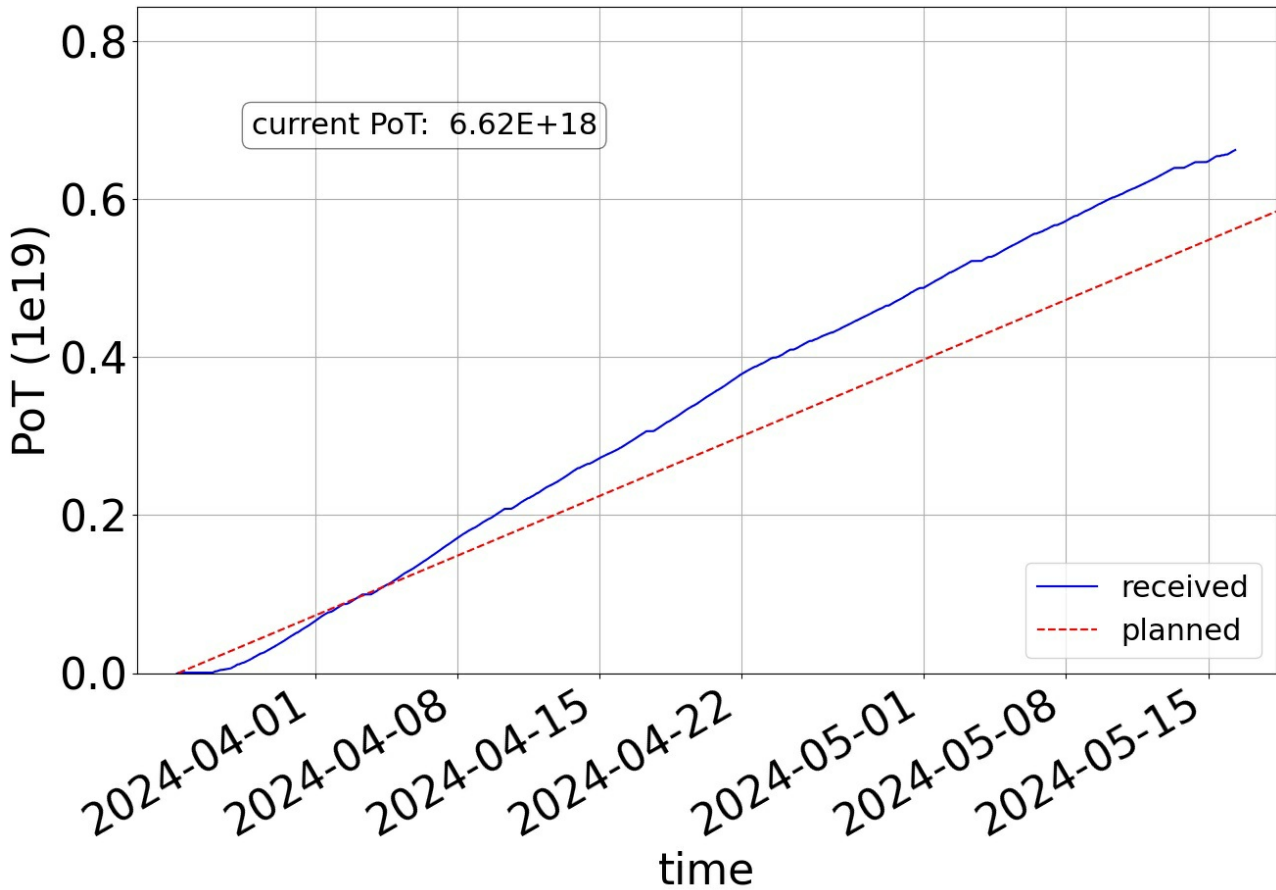
nToF (M.Bacak and P.M.Milazzo)

Stable data taking up to monday 13th. After heavy technical intervention in EAR-1, necessary to move from neutron induced capture measurements to fission studies.

No beam during daily hours on 13 and 14th.

PPAC detectors have been installed.

- EAR1: End of $^{24}\text{Mg}(n, n')$, $^{28}\text{Si}(n, n')$ test
- EAR1: Start of the $\text{Ce}(n, f)$ measurement
- EAR2: $^{146}\text{Nd}(n, g)$ almost completed
- NEAR: activation measurements



East Area Beam Status (D. Banerjee)

T09: Good operation. Issue with the power converters gateway caused about 1hr downtime on Tuesday. Beam files set up for HERD. Next week MDX magnet planned to be installed for VLAST.

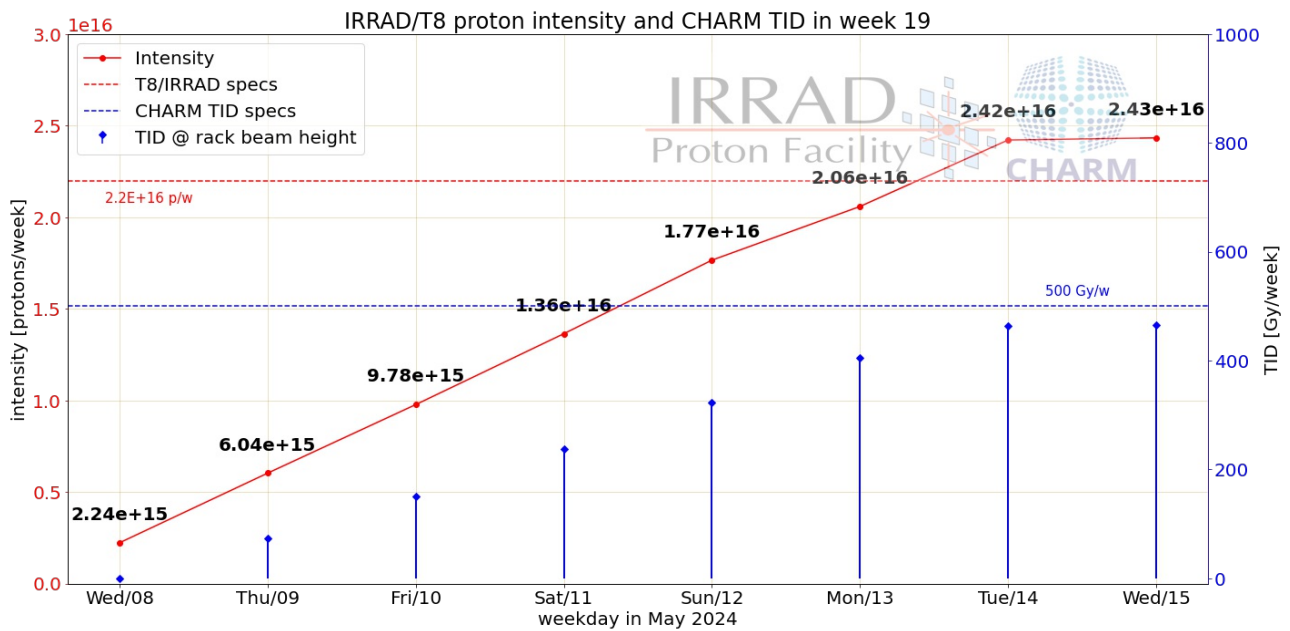
T10: Good operation.

T11: No user.

East Area Users Tour de Table

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

Regular user operation. Good week, cumulated $\sim 2.4 \times 10^{16}$ p/w on T8, see plot below. Also very good beam steering during week 19 (center within $\pm 2\text{mm}$ >94-97% of the time on both axis):



Access during Wednesday morning. In IRRAD stop the TE-CRG experiment (still cooling down), all other long-term experiments continue as scheduled and work to setup new beam instrumentation for heavy ion beam in IRRAD Zone 1. In CHARM full exchange of users (SY-RF and SY-EPC out, TE-MPE and BE-CEM in). Testing a second cooldown scheme (beam intensity down to 6E11 48h in advance). We continue until next Wednesday.

T9 Outgoing Main: STRAW TRACKER RD (Temur Enik, Katerina Kuznetsova)

- data taking with a small setup and custom electronics to prepare for the October time slot (0.1-5 GeV h and e)
- many thanks to the PS and gas teams and particularly to Dipanwita
- moved back to 887 H8 beam dump for calibration of the setup and further development

T9 Main: RE44 HERD (Hongbang LIU)

=> completed the installation of the test system and conducted safety inspection yesterday.
=> acquired data for 5.0 GeV/c electrons last night and initiating an energy scan for electrons now, ranging from 5.0 to 0.5 GeV/c, follow by a position scan.
=> We anticipate completing the testing by the afternoon of the 21st.

T9 Incoming Main: VLAST (Week 21) (LI Xiang)

Our detectors are now under test at SPS-H2 (887/PPE172).
We are going to uninstall (from PPE172), transport (from 887 to 157) and reinstall (to T9) our detector on May 22nd.
The ISIEC form has been submitted two days ago.
Muons, electrons and protons/pions are needed.
We need the magnet (with the bending power as much as possible so as. MDX-85/80?) to select gamma-rays generated by electrons.

T10 Main: ALICE ITS3 (Please Put Your Name Here)

T10 Incoming Main: EIC DRICH (Week 21) (Please Put Your Name Here)

The EIC dRICH is a prototype of a dual-radiator Cherenkov detector instrumented with a SiPM photo-detection plane to be able to achieve single-photon capability in a ~ 1 T magnetic field. The prototype have been developed in the past years with dedicated test-beams. The goal this time is to study in detail the performance of the SiPM readout with, for the first time, a full coverage of the Cherenkov ring. The parameters are photon yield, angular resolution, dependence on the wavelength, efficiency (in comparison with the gas Cherenkov of the beam times).

Incoming: AWAKE (Week 21)

Patrol of area lost yesterday at 9.20 due to maintenance of TAG42 Pad. Repatrol with SPS foreseen tomorrow.

Experiment ready fo beamtime staring on Monday 20th.

North Area Beam Status (D. Banerjee)

Brief test yesterday at 18h for T4 to check which targets can be used for upcoming weeks for e^\pm generation in H6/H8 within RP limits. Thank you all for the cooperation.

22nd May T4 target to change to 180 mm from 100 mm.

Target Sharing:

This week - T2 - 100; T4 - 40/T10 - 20; T6 - 50

Wed 22nd May - T2 - 100; T4 - ~ 50 /T10 - 20; T6 - 50

H2: Smooth operation.

H4: An issue with moving beam in the V-plane was observed by NA64. First line exchanged a power converter regulation card and the problem was fixed.

H6: Good operation with no issues.

H8: Good operation. XCET.042.474, 519 and 537 tested and found fully functional.

M2: Good operation. CEDAR 089 showed improvements following the fix on the diaphragm.

P42: Good operation.

North Area Users Tour de Table

P42-K12:

Main: NA62 (A.Kleimenova)

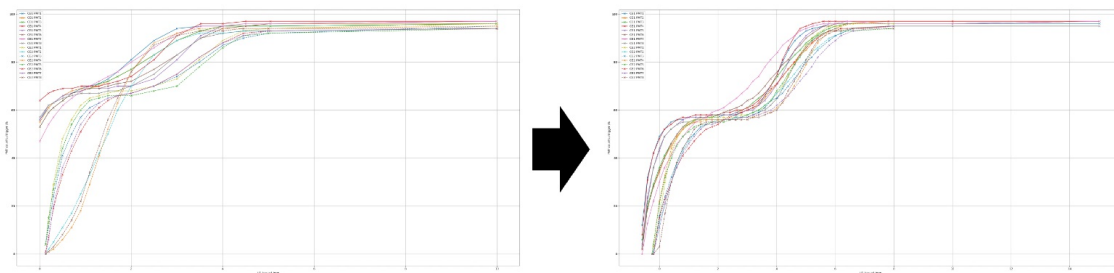
Very good beam availability since last Thursday, with only long downtime on the night of May 12th (RF issue). We had to open access two times: once for our issues with timing system and another time to replace the faulty valve in TCC8 (VAC.VPGR.101.004.1A).

We would like to slightly increase the intensity on T10, and keep it between 20-21E11.

M2:

Main: AMBER (Thomas Poschl)

- Recommissioning of Cedar 089 confirmed that intervention was successful. Great thanks to all involved people from BE for the fast repair!



- installation of IH target concluded and start of commissioning and safety-clearance procedure
- planned start of data-taking with IH between 29.05-01.06
- total of 1 month delay for the IH target, asked SPSC for extension of the Antiproton-production measurement. Including the high-intensity DY test at the end (5days), we would run now until 17th July, already included in the last schedule (v.1.1.4)

H2:

Outgoing Main: ALICE PHOS (Mikhail Ippolitov)

In period 30.04-15.05.2024 on H2 SPS ALICE/PHOS have been taken measurements of energy and time resolution, linearity for VME and FEC32 electronics. Measurements done in energy points 10, 15, 20, 30, 40, 50, 60, 80, 100, 120, 150 GeV. Very good beam. Rate characteristics of the ALICE/PHOS detector were measured at 10, 50 and 100 GeV (FEC32). Tests of the electronic card were done, the card meets all technical requirements. The final version of the photodetector was tested. We have got big amount of data for future analysis. Thank you to all teams working on the SPS NA beams, personally to Nikolaos Charitonidis, Bastien Rae, Michael Lazzaroni and the people who helped us during the test.

Main: VLAST (LI Xiang)

We installed our detector into PPE172 yesterday. Thanks to Michael for the technical arrangement and James for the safety inspection. We performed a test in the late night. The beam seems OK but there are still some small problems with our DUT to be issued. Thanks to Nikos for making the beamfiles and also thanks to Dipanwita for CESAR help in the late night.

H2 Incoming Main: ALICE FOCAL (Week 21) (Rado Simeonov, Tommaso Isidori)

- Transport of FoCal-H from 251/R-004 to 887 scheduled for Wed 22nd morning. Crane operators to be contacted for moving the prototype on the support. Safety clearance scheduled today for Wed afternoon (@ 15:30).
- SETUP: DESY table + XSCA table for prototype and trigger system. Also, 1/2 Tables in the area are needed. (Optional.: 19 inch rack if already present in the area).
- 2 types of readout electronics to be tested:
 - Wed 21st (afternoon - night shifts):
 - H2GCROC readout + Xilinx KCU board

- Hadron energy scans (100, 200, 300, 350 GeV)
 - Electrons energy scan (?) (150, 100 and 60 [according to NA64e electron beam caveats]).
- Thu 22nd - Sun 25th:
 - CAEN DT5202 readout boards
 - Hadron and electron energy scans.
 - Compensation tests with same energy hadrons and electrons beams
 - Position scan to check influence of structural inhomogeneities on performance.
 - from Sun 25th:
 - Switch back to H2GCROC and repeat program

H4:

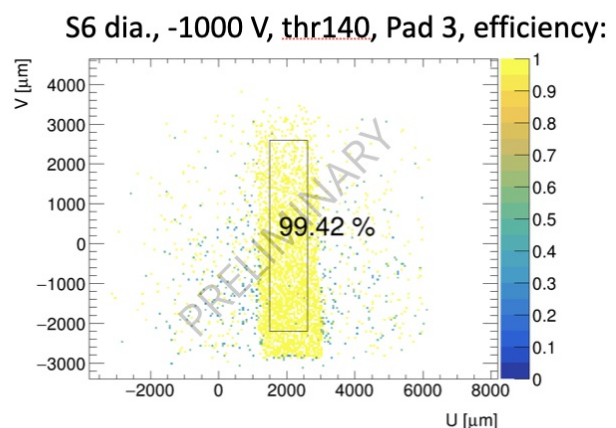
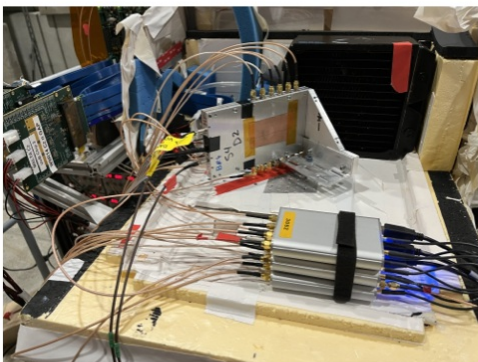
Main: NA64e (Please Put Your Name Here)

H6:

Outgoing Parallel: ATLAS BCM PRIME (Miha Mali)

- Installation on Wednesday and safety check went smoothly.
- Managed to measure multiple threshold scans at different HV values between ± 1000 V with two detector modules with pCVD diamonds and the latest version of Calypso ASIC.
- Tracking with MALTA telescope worked great.
- We are very happy with the beams, very stable, few interruptions.
- Some preliminary analysis already done.

Setup with BCM Prime single-chip module
& readout inside MALTA telescope:



Outgoing Parallel: CMS MTD ETL (Giacomo Zechinelli)

- Goal of the test beam was testing ETL modules and ETL FE electronics for Phase II upgrade
- We installed our setup on Wednesday morning, had some hiccups at the beginning with getting our cold box placed inside the AIDA telescope and chiller pipes fitted, but everything was quickly resolved thanks to Andre, Laza, Bane and Michele who helped a lot setting everything up!

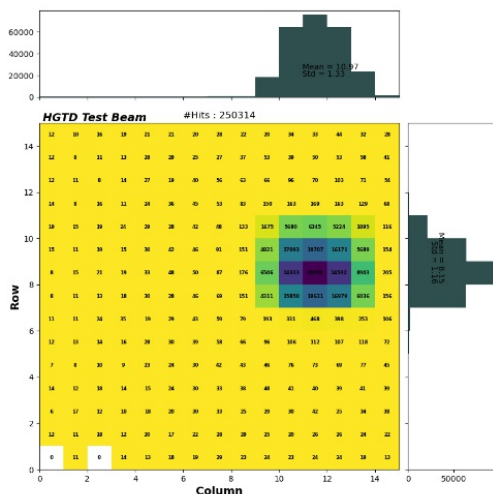
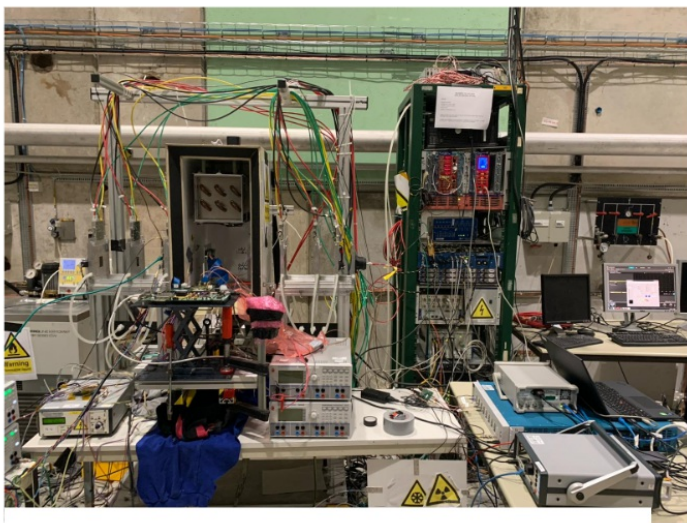
- We nonetheless made it to be ready for safety inspection at 16 and starting from 18 we got beam clearance.
- Test beam concluded recording >10M events with multiple samples under test
- We experienced some downtime due to beam unavailability between Sunday and Monday, apart from that beam was good and stable
- Also many thanks to our ATLAS HGTD colleagues in main, who made sure their interventions were advertised and manage to keep them at minimum.

Main: ATLAS HGTD (Djamel Boumediene and Stefano Manzoni)

Testing ASIC+LGAd hybrid modules and LGAD Sensors alone for HGTD Phase II upgrade

Setup installed in H6A between Wednesday and Thursday of the last week

So far we are fully complying with our test program - two out of three hybrids have been tested



Plan for the next days:

- we would like to have 2/3h hours access (no beam in PE146 and PE156) tomorrow morning to install the last hybrid to be tested and doing calibration
- after that next access should happen on Monday morning and Tuesday to changes DUTs and move to LGADs alone measurement

We want to thank our colleagues of CMS MTD ETL and ATLAS BCM Prime who allowed us to freely organize our accesses, which we tried to minimize but were not few in the first part of the week.

Since our next testbeam campaign will start on the 29 May, on wednesday 22 we will only dismount a minimal part of our setup to not interfere with High rate beam, basically just the MCP

Parallel: ATLAS ITK PIXEL (Please Put Your Name Here)

Incoming Main: EP PIXEL (Week 21) (Younes Otari, CERN)

Preparing for test-beam characterization of H2M samples and MCP-PMT timing performance studies

Status:

- EP-Pixel telescope fully commissioned and operational since our last test-beam

Plan:

- Wednesday or Thursday: Mounting of H2M sample
- Rest of the test-beam time: Measurement plan

H8:

Outgoing Main: UA9 (Francesca Galluccio)

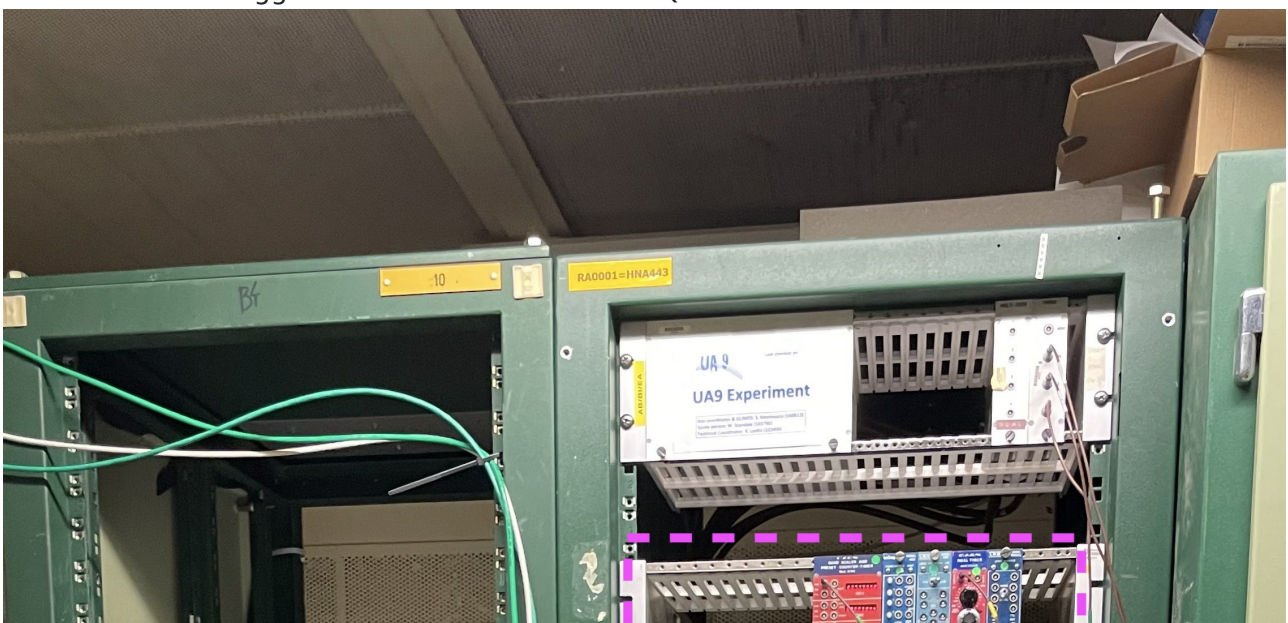
UA9 detectors have been installed and the commissioning of the 6-plane tracker is going on.

Easy communication with the other team on the line.

Already agreed on how to proceed after the swap as main user.

Thanks to the beam physicists for their prompt attention also during the long weekend.

After this week, we'll be back on June 12; if this is not an obstacle for the next users, we would like to leave the trigger electronics in the rack in Q40.





Main: LHCb (Federico Ronchetti and Ettore Zaffaroni)

- Completed light yield measurements on Tuesday
- SciFi telescope installed on Wednesday, started taking data for time resolution measurements
- These will be completed next week and we will dismantle next Wednesday, when

ATLAS tilecal moves in the beam

Incoming Main: ATLAS TILECAL (Week 21) (Giulio Usai and Tigran Mkrtchyan)



Installation activities are progressing in the Tile garage and in counting room:

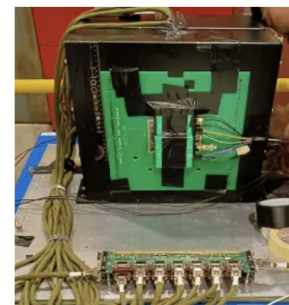
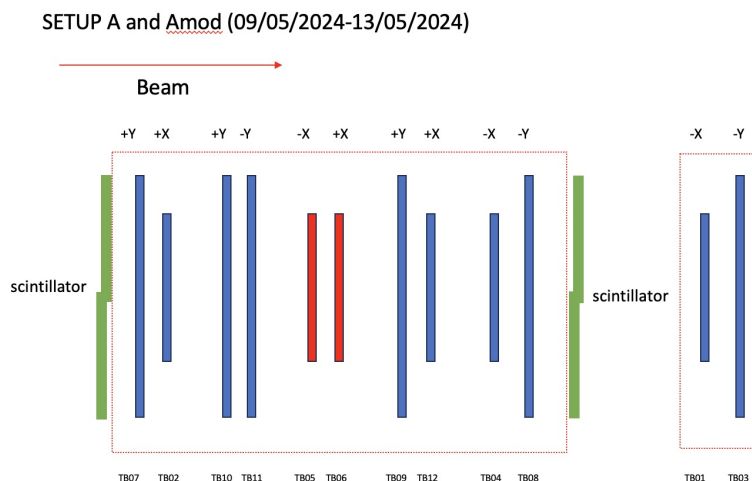
- one new super-drawer electronics module was inserted using the tools and the procedures we are validating for the installation during LS3 (picture show a mini-drawer element).
- We meet Maarten and Silvia on Monday to discuss the preparation status and define beam settings and configurations.
- All infrastructure activities are scheduled (Fences removal, vacuum chambers, gas changes in the Cherenkovs, signal routings, etc. etc.)
- Latest prototypes of DaughterBoard and Pre-processors (the components going to the FDR late this year) are being tested and FW finalised. Will be mounted at the latest on Wednesday.

Many thank to all infrastructure team for the help and kindness!

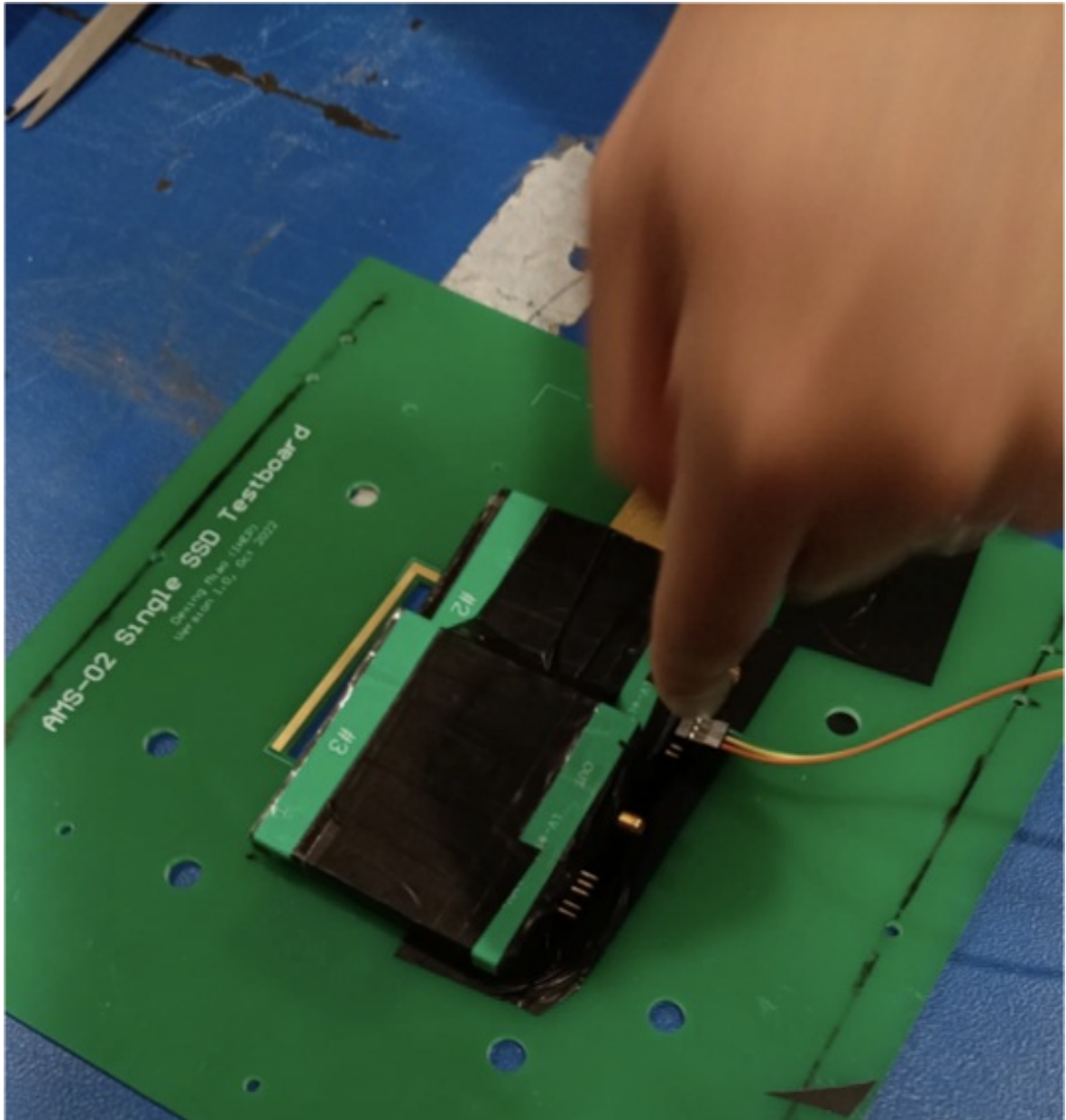
Parasitic Users

H6: RE1 AMS L0 (M. Duranti - INFN Perugia)

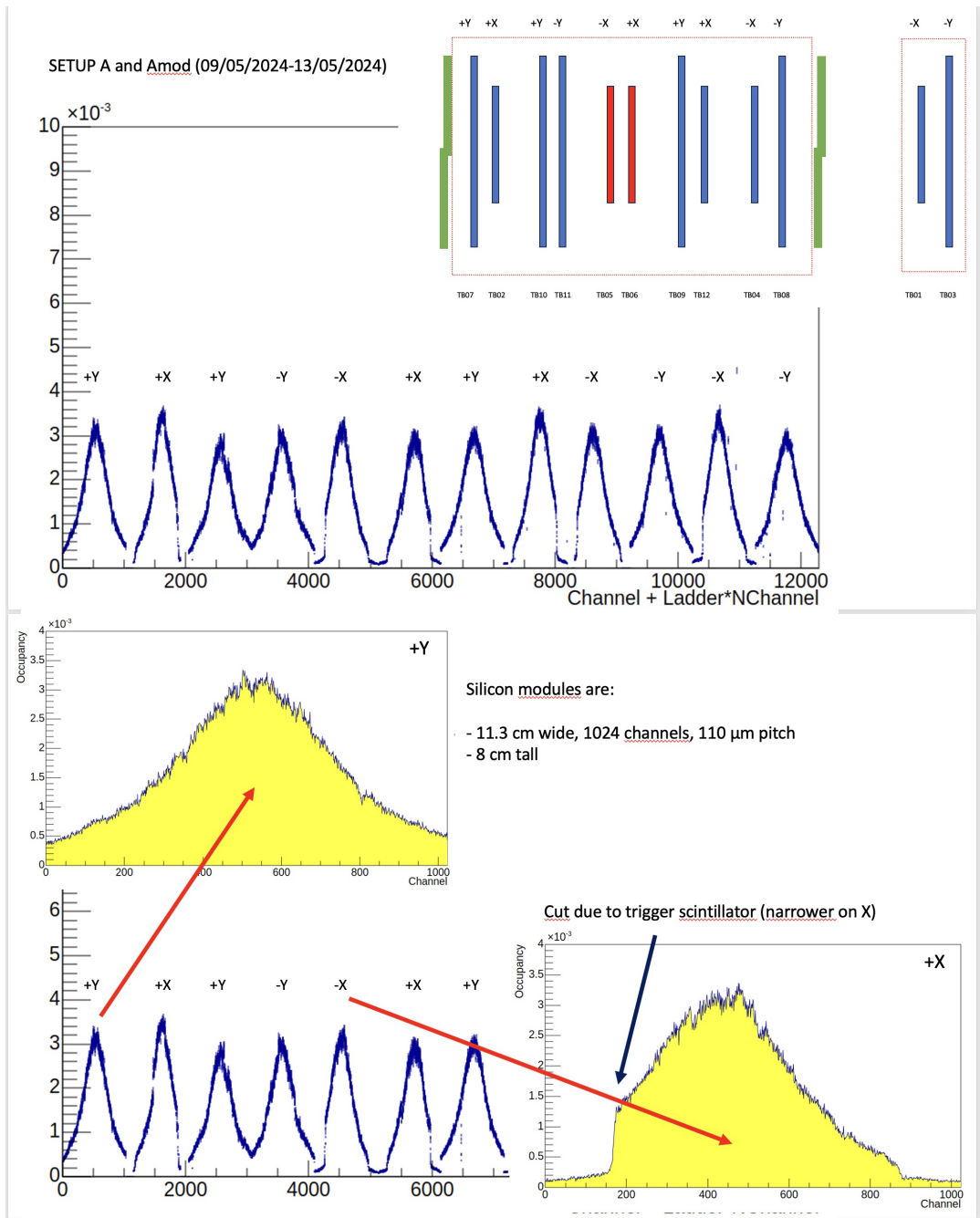
- measurements on going: we'll report on the last thursday
- setup used in the first week:



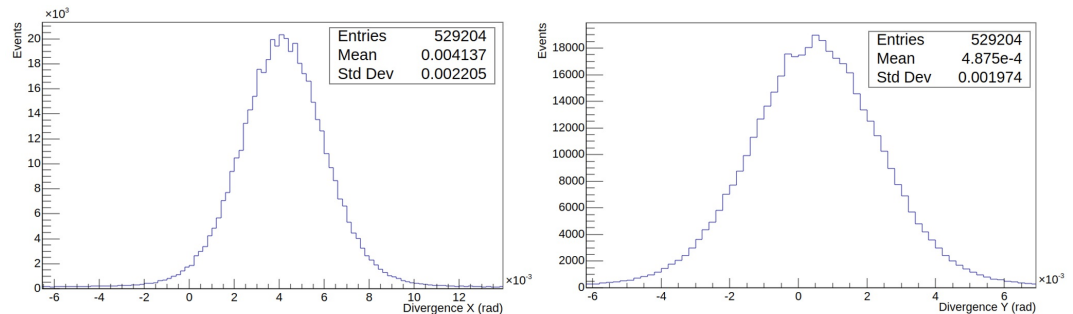
Amod: two scintillators, side-by-side, slightly overlapping for a wider trigger acceptance



- report on the beam
 - 2500-3000 particles per spill (in the 15/May tests at 18:00 we saw up to 50-55 kparticles per spill)
 - beam profile:



o divergence:



H6: MONOLITH (Théo Moretti)

Testing the second prototype of the MONOLITH chips with PicoAD gain layer.

We took data overnight (15/05 to 16/05) but our useful rate is a factor 55 smaller than was we used to have in the highly focused, high intensity run together with EP-Pixel 3 weeks ago.

We will focus our efforts on the upcoming week with beam conditions more suited to us. We will still use the beam for secondary measurements that require smaller statistics.

H6: ATLAS MALTA (Please Put Your Name Here)

H8 Outgoing + Incoming (Week 21): LHCb (L. Martinazzoli)

Data taking proceeding smoothly and successfully.

ATLAS TileCal will be upstream in weeks 21-22. Particle rate will drop too much to perform meaningful measurements. We are happy with the current run and will de-install at the end of week 20.

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

H8: UA9 (Please Put Your Name Here)

AoB

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