

Minutes of the PS-SPS Users Meeting

held on 14 April 2022

PS Machine Report (Denis Cotte BE-OP-PS)

- Last week we had 83% availability, with main following faults:
Thursday 7 - Friday 8 :
 - Injection devices PI% with communication issues -> No beam ~18h
 - Detail report from EPC to the FOM planed in 2 weeks time.Tuesday 12 :
 - Acces needed to repair C10-11 (relay gap), C10-86(final amplifier) -> No beam ~1.5h
 - Regulation issue on DHZ60 Orbit corrector -> No beam ~1.5hYesterday evening Wednesday 13 :
 - no beam from LN4 due to broken patch Panel on Klystron PIMs3-4 -> No beam ~5.5h
- EAST_T8:
 - Back to 2021 optics, tail (beam sweep) still present.
 - Yesterday, a quick fix to compensate the sweeping with correctors in T8 reduced the tails.
 - Irradiation ongoing ...
- EAST_TN_T9:
 - Same recipe to compensate the sweep on target.
- SFTPRO:
 - Core only provided to SPS at 7-8e11
 - Full 5 turns provided to SPS at 500e10
- TOF:
 - dedicated cycle provided maximizing proton rate on target.
 - parasitic TOF setup started on EAST_T8

SPS Machine Report (Arthur Spierer)

- Two NA beams setup, 5e11 p/spill and 5e12 p/spill
 - Beam on all primary targets
 - Replaced RF off by 0 Voltage with beam loading compensation -> awaiting for feedback from NA
 - Accesses on Monday for closed valve of two quads in BA80 and board replacement in BA81 TT83
 - Access today in BA80 for coil temp interlock on wobbling magnet
- scrubbing state
 - 4x 72 bunches with 1.55e11 ppb at flat top
 - 5x 72 bunches at flat bottom with 1.8e11 ppb
- Awake
 - Extracted to TED with bunch rotation sub 1 ns bunch length
- Continuous setting up week 16 (intensity ramp-up)
- Start of NA Physics in week 17

SAFETY (Evelyne Dho, James Devine & Letizia Di Giulio)

Remember to submit ISIEC form a week before your beam time.

East Area users tour de table

EA beams status (D. Banerjee / B. Rae / J. Bernhard)

LDMX setting up and commissioning with beam going successfully in T09. Beam files have been set up. Final tuning will be done tomorrow with the experiment. Nothing to report for T10 and T11.

T8: IRRAD and CHARM (F. Ravotti / G. Pezzullo / S. Danzeca)

Following the access of Wed. 6th the CHARM experiment run until Friday evening, then on Monday. Rest of the beam time used by us to complete measurements with XSECs (taking data with SE beam to compare with FE beam calibration) and by OP to optimize the beam profile (tail due to sweep on H plane) important for proton experiments in IRRAD. Because of this, it was decided to revert to the “old” optics used on T8 in 2021 but the dosimetry run with films on Tuesday showed that this did not reduce the tail that, in the region upstream IRRAD, still extended for more than 40mm and contained up to 45% of the core beam. After the access of yesterday (Wed. 13th) the afternoon was used by OP to implement a quick fix for this problem (function on a horizontal corrector to cancel the sweep on the horizontal profile - see PS report) and in the evening we could start irradiations in IRRAD Zone 3 and for a new user in CHARM.

T9: LDMX (B. Echenard)

The detector prototype is fully operational, and we have integrated the beam instrumentation data (Cherenkov detectors and beam trigger scintillator) and the white rabbit signal in our DAQ system.

We have started to take calibration and physics data on Wednesday. Our online monitoring tool indicates that the data quality is satisfactory, and we are developing a full suite of offline data analysis tools to analyze the data in more detail (including beam instrumentation data). We should be able to preliminarily assess the performance of the calorimeter in a couple of days.

It would be useful to take data with a wider (defocused) muon beam to improve the calibration of the detector. Dipanwita has produced the required beam configuration files, but the beam scintillator trigger is unfortunately too small to provide a useful signal. We are working with Inaki to understand if we could install a wider scintillator in the beam for calibration purposes.

We plan to continue improving/tuning our DAQ system and take data over the next two weeks, and start the offline data analysis. We make sure to contact the PS control room to release the beam request when we don't need it.

We express our thanks to the CERN staff Dipanwita, Aboubakr, Bastien, Inaki and their colleagues for their excellent help.

T10: ATLAS ITK PIXEL (Andre Rummler)

Handover from ATLAS HGTD was done on time. ATLAS cooling team installed a replacement chiller for the one damaged by transport (actually two as mixed water cooling necessary) which came too late for HGTD. It works fine after fixing a water leak but there are issues with unsupervised running. Two ITkPixV1.1 single chip modules were installed and finally successfully operated after issues with DAQ computers. About 1M events with nice looking correlations were

taken and reconstruction is ongoing; issues with desynchronisation after a specific number of events under investigation. SW and firmware under improvement (CPU consumption, sync., quad operation, keeping compatibility with RD53a) and test with beam. Baseline measurements will be likely achieved during PS beam time and are intended to be continued at SPS one week later. Telescope transport to be organized and scheduled, followed by re-commissioning in H6A; will determine the end of beam time.

T11: CLOUD (E. Sommer)

CLOUD had its first physics run with the new system on April 12th using two spills per supercycle. Things went very well, the beam was very stable and we were able to produce good results. We are still debugging last problems and will probably request 2 or 3 spills for a couple of shifts during the coming week.

n_TOF (M. Bacak)

Running physics for 2.5 weeks with same physics cases (check out previous presentations by Nikolas Patronis). Grateful with the machine's performance up to now as we're progressing according to planning.

North Area users tour de table

North Area Beam Commissioning (D. Banerjee, J. Bernhard, N. Charitonidis, A. Gerbershagen, B. Rae)

Good progress on all beams. All lines have seen the beam and first configurations for the NA experiments and test beam users are ready (see dedicated contributions for details). Problem in TCC2 needs to be understood, but will impose some delay on the commissioning.

H2 and H4 Beams (N. Charitonidis, B. Rae)

First proton and electron beams seen in H2/H4. Optics studies for NA63 ongoing, measurements for electron purity for users parallel to NA64-e completed, and users have been informed and agreed.

H2: NA61 SHINE (Piotr Podlaski)

- installation of new readout electronics on TPCs almost completed - due to component shortage we miss 1.5 sectors out of 76
- no major activity planned for upcoming week
- we plan to test whole upgraded detector during our beam period (25.04-11.05, 18-25.05)

H6 Beam (D. Banerjee)

All required optics configurations have been checked for H6 secondary beam at 120 GeV. The parallelism of the beam has been checked for the scheduled CEDAR test and the tertiary beam has also been checked. In the coming week a CEDAR-N detector will be tested to have it available for the users if needed.

H8 Beam (A. Gerbershagen)

Primary (Microbeam), secondary and tertiary beams of H8 have been tuned. The beam is well aligned and has the expected intensity and position in the user zones H8Z and H8A. The electron intensity in the user zones is as in 2021, so the problem of too low electron rate still persists at the

same extent. The beam in zones H8B and H8C has not been set up yet, since the former was occupied by MADMAX. It is scheduled to commence next week.

H8: MADMAX (Pascal Pralavorio)

- Morpurgo magnet could finally ramp up to nominal 5 kA (1.6 T) on Thursday 07-Apr (just after the last PS/SPS user meeting). Stable for few hours but not more.
- 10.5 hours of data could be taken in stable conditions before the week-end with CB100 set-up
- This week, perform tests with P200 set-up : Tuesday 12-Apr and Wednesday 13-Apr at 1.6 T. This completed our MADMAX tests for this year. We will free the zone today at 12:00
- We measured fringe field around Morpurgo for CERN safety (Marco Buzio).
- Overall very successful and useful data have been collected. We hope for more stable conditions with the magnet next year

P42 and K12 Beams (J. Bernhard)

First P42 steering on NA62 muon signal on the weekend, yesterday setting-up of beam instrumentation and repeated steering in horizontal plane. Today continue with vertical plane and set-up muons for nightly runs of NA62. When more intensity becomes available, we'll start the focusing exercise for T10, probably on Friday. Afterwards, continue with K12 in kaon mode on the weekend and during the next week. This all depends very much on the TCC2 intervention and outcome.

K12: NA62 (R. Fantechi)

Doing the last checks on the detector to be able to start in time.

The tools to provide feedback for the study of the beam structure in the first second are ready and their accessibility from the beam team side has been checked.

M2 Beam (D. Banerjee)

The starting configuration for NA64mu has been checked as well as the parallel optics for MUonE at 160 GeV. The nominal optics for COMPASS is also ready. The higher and lower momenta requested for the 2022 test runs will also be tested in the coming days.

M2: COMPASS (Michael Pesek)

- Good progress with hardware preparation Minutes of the PS-SPS Users Meeting held on 14 April 2022
- Beam telescope installation finished
- BMS and SciFi detectors ready
- DCs and MMs ~ready
- RICH HV debugging ongoing
- Polarised target ready for TE callibration (starting today)
- Problem with PT magnet power convertor - FGC software updated again without any information-> some extra effort was needed from EP-DT

- We appreciate the accommodating approach of our beam colleagues which allows us to interleave the beam commissioning with access to the experimental area

M2: NA64mu (Laura Molina Bueno)

We are finishing preparation of commissioning of detectors. We already filled the ISIEC form and we have asked for safety clearance Tuesday 19th at 10.

Supercycles, Wobbling, Target intensities

AOB

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