

# FOM minutes 06.04.2021

Chair: K. Hanke

**List of participants in ZOOM meeting:** Albert M., Albright S., Amarilla Garcia M. E., Antoine A., Bartosik H., Bart Pedersen S., Bilko K., Bozzolan M., Bracco C., Cettour S., Chapuis D., Damerou H., Deleval S., Delrieux M., Demarest P., Di Giovanni G. P., Dos Santos F. B., Fadakis L., Farabolini W., Findlay A., Gourber-Pace M., Grenard J. L., Haase M., Hanke K., Hofle W., Huschauer A., Kain V., Karpov I., Lallement J. B., Li K., Lozano M., Mahner E., Mataguez S., Matheson E., McFarlane D., Mikulec B., Newborough A., Nielsen J., Nuiry F. X., Papotti G., Piselli E., Ponce L., Praena J., Rossi C., Rumolo G., Salvant B., Schenk M., Simon P., Skowronski P. K., Tecker F., Vincke H., Woolley B., Wu Y., Zevi della Porta G.

Slides: <https://indico.cern.ch/event/1020414/>

## Agenda

1. Approval of minutes & follow-up of actions
2. Reports from Accelerators & Facilities
3. AOB

### 1. Approval of minutes & follow-up of actions

- Minutes of previous FOM (30.03.21) accepted without further comments
- Currently no open actions

### 2. Reports from Accelerators & Facilities

#### a) TI (*J. Nielsen*)

- Tuesday afternoon: GMT timing issue due to overheating PSU; affected LINAC4 and PSB; potential solution: slower warm-up to avoid thermal shock on PSUs
- No other incidents
- IT will perform a network intervention that will impact Building 179 next Thursday, 8 April. J. Nielsen confirms that this has already been agreed upon by ISOLDE and will go ahead.

#### b) LINAC4 (*J. B. Lallement*)

- High availability throughout week (97.7 %)
- Tuesday afternoon: affected by GMT timing issue above, operation stopped for 1.5 h
- Sunday morning: polarity changer switch fault, 2 h downtime, but without actual impact

#### c) PSB (*C. Bracco*)

- Availability: 93.3 %
- Tuesday morning: access with [several activities \(sl. 3\)](#)
- Tuesday afternoon: spent in recovery mode after access, and affected by GMT timing issue
- Activities with beam
  - o Continued BE4.KFA14 waveform measurement using LHCINDIV rotated bunches
  - o First optics measurements with tune kicker
  - o LHC25ns: continued resonance and beta-beating correction for different working points (WP) and intensities; study possibility to reduce momentum spread of injected beam to improve RF capture, and tail reduction in transverse (mainly V)
- MTE beam
  - o Defined "optimum configuration" at injection (WP, vertical offset, transverse painting): emittances: 12 – 14  $\mu\text{m}$  (H) and 3.6  $\mu\text{m}$  (V), no tails, intensity  $600 \times 10^{10}$  ppb. Not yet what is required by SPS => trying to improve further
  - o Impact of distributor waveform => *not* the reason why limited to 3.6  $\mu\text{m}$  emittance (V)
  - o RF: minimized losses in all rings when injecting up to 60 turns; bunch splitting optimized for R3 (for now) => uniform bunches and emittance  $\sim 1.6$  eVs; problem with synchro-loop <-> recheck this week

- POPS-B
  - o Improvement of oscillations after Bdl regulation, but further studies and analysis ongoing
  - o Need iterative process Bdl <-> POPS-B regulation to find optimum
- Next steps
  - o POPS-B studies improved regulation together with Bdl tuning
  - o LIU wire-scanners (WS): work required to systematically get reliable profiles
  - o Continue beam setup: MTE RF setup; LHC25ns optimization (resonance, beta-beating, momentum spread reduction); start with ISOLDE and AD beams

#### Questions / comments

- K. Hanke: Are old or new WS used and how do they compare? C. Bracco: Both are used and results show rather good agreement (for LHC beams: difference about 0.2 um)

#### d) ISOLDE (E. Piselli)

- No major issues last week
- Test new app. for silicon detectors: works, but some functionality still to be implemented with BI
- BI experts intervention for noise issue in HRS separator semgrid; continues this week
- HRS separators WS cannot be used at same time due to noise issue. To be addressed this week.
- Mass scan app. tested
- RFQ setup: had to be stopped due to intervention by EN-EL (power cut for vacuum controls): 4 of the sectors not yet restarted, to be done asap
- Beam set up for GPS front-end
- This week:
  - o Stop target heating due to 3-day intervention of ventilation and cooling water system
  - o HIE ISOLDE cool down continuing according to plans

#### e) PS (F. Tecker)

- Continued setting up MTE. Beams now ready for SPS
- Commissioning of fast WS: some bugs resolved, some display / fit issues which BI is looking into
- BGI: some bugfixes and corrections done in the app., needs some more work
- TOF bunch rotation works fine (already done in March)
- New release of Qmeter2: chromaticity measurement works again in PS
- Transverse feedback setup: done for LHCINDIV and MTE, ongoing for other beams
- RP survey around SS88: vacuum spike tripped C80-88; hot spot due to losses, in agreement with observations from BLMs => added V bumps to minimize losses, further work needed
- [Other work in progress and several non-blocking issues during Easter weekend \(sl. 5\)](#)
- Beam status: LHCINDIV 1 to 4 bunches ready for SPS except transverse validation; MTE low intensity available in 3 configurations (core only, islands only, core + 4 islands)
- This week:
  - o Continue work on shadowing
  - o Continue setting up LHC multi-bunch splittings
- Reminder for daily meetings at 5 pm

#### Questions / comments

- B. Mikulec: Is source of losses understood (misalignment problem?), and are bumps only around location of cavity? F. Tecker: Not fully understood yet; needs to be looked into in more detail
- K. Hanke: Access for RF, can we organize with LINAC and PSB teams? F. Tecker: If no accesses planned by other machines will go ahead in coming days according to their measurement schedules; to be organized ad hoc with the machine coordinators.
- From SPS side modification on access system required, will access TT2 today between lunch and 2 pm. Request to send PS beam to internal dump. Access may be coordinated with required PS intervention as well? F. Tecker will check with responsible persons and organize intervention.
- F. X. Nuiry: What beam intensity will be dumped on internal dump (limitation is  $900 \times 10^{10}$  p)? Was confirmed to be only  $200 \times 10^{10}$  p.

- K. Hanke: 2 out of 5 WS operational at the moment. Confirmed by F. Tecker, but they do not give profiles all the time and some follow-up still needed. K. Hanke elaborates that since BGI still in setting up phase we currently fully rely on LIU WS for emittance measurements.

**f) ELENA / AD (L. Ponce)**

- ELENA
  - o Orbit drift and oscillation from H- source still there but seems to calm down
  - o Continue commissioning of deceleration cycle (optics, orbit, e-cooler with H-, RF gymnastics)
  - o Intervention on Qmeter to correct inversion of signal (V plane)
- Transfer lines
  - o Could not start LNE02 line commissioning due to vacuum issue: to be investigated today
  - o Incorrect connection of quadrupole in LNE02: to be investigated today
- AD
  - o Injection of resin in stochastic cooling kicker done last week; cooling down today and leak test tomorrow
  - o Damaged interlock cable between access system and power converter fixed. Continue with DSO tests planned for next week

**g) SPS (V. Kain)**

- Last week: [ongoing HC with many tests and checks done, sl. 2 & 3](#)
- Planning this week:
  - o SBDS reliability run; BT working on auto soft start if SBDS does not pulse at high energy to avoid vacuum spike
  - o DSO tests (7. April: SPS ring phase 2, Ion interlock; 8. & 9. April: North area primary chain)
  - o 4 FCMs need to be checked due to power converter instabilities
  - o Continue interlock checks; install and test fast interlock from WIC
  - o Thursday & Friday: pulse for 16 h to simulate conditions with beam (no access possible)
  - o Prepare beam permit for injection Monday, 12. April
- BC in SPS originally planned to start on 12. April. Unfortunately, SPS will be delayed. New plan is to still take beam on 12. April to establish circulating beam and make sure there are no aperture restrictions. Then hand back to RF to continue HC for 2 weeks (W15/16). Then 1 more week (W17) for RF capture to start acceleration on Monday, 3. May (W18). This will result in a 1-week delay overall if everything works out. Likely no beam requests during W15. To be seen for W16.

*Questions / comments*

- K. Hanke: Why delay will be just 1 week rather than 2? V. Kain: RF capture originally planned to take 2 weeks, but now (optimistically) reduced to 1 week.
- K. Hanke proposes to include 1 slide with new SPS timeline for next FOM: What beams will be required from the PS and PSB when?
- K. Hanke: Is there impact on the general 2021 accelerator schedule? V. Kain: For the time being will try to absorb delay, so no change of run plans at this stage. If something changes, will reevaluate.

**h) AWAKE (G. Zevi della Porta)**

- 2nd week of e<sup>-</sup> beam: successful propagation of electron bunch in Rb plasma. Measured deceleration and acceleration of e<sup>-</sup> and charge loss
- New DAQ system for digital cameras from BI, progressing well
- RP access in TAG41
- Steps towards e<sup>-</sup> in plasma
  - o Warm up vapor source, align Rb interferometer, fill with Rb gas, cool down at end
  - o Laser: align, reinstall pickoff measurement (camera and energy meter). Test of Rb ionization verified by laser pickoff measurements
  - o Electron propagation in plasma and measured on spectrometer: energy loss / gain during transport as expected. Full measurement sets acquired at 150 and 300 pC e<sup>-</sup> beam charge
  - o Downstream streak camera: measured e<sup>-</sup> bunch length for both charge setups
- Serves as "rehearsal" of finer set of measurements planned for May
- This week: access in preparation of laser ionization measurements

- All of April: reserved for laser measurements and how laser ionizes plasma (width, on / off-resonance Rb ionization threshold, etc.)

**i) LINAC3 (E. Mahner)**

- TS last and this week
- This week, exchange of Al coated plasma chamber towards stainless steel chamber
- Operation will be resumed next week
- Everything according to plan

**j) nTOF (J. Praena)**

- Nothing to report; continuing with target installation; everything according to plan so far

**k) CLEAR (W. Farabolini)**

- Last and this week: beam operation started; to be operational within 1 week and soon ready to serve first user for BI experiments

**l) East Area**

- Nothing to report

### **3. AOB**

- S. Deval: Has the TS planned for 21. April been postponed? K. Hanke: There has been no official announcement concerning that. Will be communicated in case.

*Minutes by M. Schenk*