



**ELENA:
Commissioning meeting Minutes**

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Presence

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1 INTRODUCTION

T. Eriksson says that the minutes of the previous meeting have been approved.

2 CYCLE SETUP AND OPTIMISATION WITH PBARS

L. Ponce is presenting the cycle setup & optimisations.

L. Ponce starts by reminding that all these tests have been performed without any E-cooler power supplies ON.

The main working topics were: systematic corrections of the injection oscillations, to adjust Tunes and Coupling on every plateau, to increase by 1s both ramp lengths and to set a longer rounding (210ms instead of 10ms) on the second ramp

Pbars are now reaching the last plateau. The main losses start in the middle of the second ramp. Tunes were adjusted along the cycle. Coupling was minimized using the skew quadrupoles. L. Ponce says that the correction strength needed is increasing with decreasing momentum.

Tune measurement quality is good until the intermediate plateau. The readout is more complicated along the second ramp (maybe due to the low intensity). There is a clear discrepancy between the measured tune values and the programmed tunes. The difference increases when the momentum decreases. Therefore high level parameter adjustment of Q_h/Q_v can't be done on the last plateau and the correction has to be done by manually applying current corrections on the 3 Quad families.

Some emittance measurements were performed during the second ramp ($H=25\pi$, $V=11\pi$). On the intermediate plateau ($H=25\pi$, $V=9\pi$) are measured.

With the initial optics setting there may be an optics mismatch between AD and ELENA. This mismatch may come from erratic setting of the first part of the transfer line where opposite polarities were found on the first two quadrupoles.

A new optics set was tested. It may have improved injection but does not show other benefits. These optics corrections need further investigation.

Next step is obviously turning ON the E-cooler and investigate losses during the last ramp (try a new working point and also try to understand and disentangle longitudinal/transversal undesired effects). The horizontal profile at injection should be studied. Finally the orbit has to be corrected further down the ramps.

3 RF COMMISSIONING PROGRESS

D. Gamba present the LL-RF progresses.

The Phase loop setup for H- was optimised to use the whole correction range. The new settings are working but stability have to be checked.

The same work has been done for the Pbar phase loop. It has been noticed that the phase computed from the TPU and the LPU show differences. They need to be understand.

The Radial loop also was optimised but no major difference on the beam is visible. This has to be discussed with the RF team.

B-train averaging has been implemented to reduce the b-train signal noise. Large averaging values have a great impact on the radial loop.

The I/Q signals from the TPU Sigma could be used to compute the beam intensity.

When the beam is injected from the AD to the ELENA bucket, the Injection Synchro loop has been validated. A Smooth transition towards the b-train-provided nominal frequency is generated. Radial and phase loop need also to kick in gently. Timing and loop gain were adjusted.

De-bunching and re-bunching was tested on a plateau to see how it affects the beam, initial tests show expected behavior.

Works in progress are:

- Debugging of RF cycle segmentation: First tests positive! but some bugs found which are being fixed.
- Magnetic and transverse pickup signals available in control room.
- Debug/reduction of Longitudinal Pickup noise
- Adjustment of Cavity voltage : Empirical process.

4 E-COOLER STATUS & PROGRESS

L. Joergensen says that the E-cooler has delivered the first E-beam on the 29th of May with all the magnets at nominal values.

The Filament was raised up to 12A (nominal is 9A). A brutal power cut was done with no bad side effects detected.

A few days were dedicated to replace a broken power connector for the filament.

In the last few days the E-cooler was setup without expansion to generate a small beam of electrons minimising current losses. 1mA at 55eV was easily reached. The nominal energy for 355eV with minimum losses was achieved. The Vacuum is slowly improving with time. After 12h of beam the vacuum has improved by a factor 25.

The expansion coil hasn't reached its nominal value. It will be done slowly depending on the vacuum variations caused by the collector outgassing.

Further testing and set-up is required for the HV power supplies and fine correctors.

5 AOB

The Tune kicker has been X-rayed. It seems that the electrode has fallen vertically into the chamber without interfering with the beam area. Nevertheless, results are still to be confirmed by the specialists. A bump could be inserted in this area to investigate possible aperture restrictions.

Injection line SEM has shown beam profiles with both Pbars & H-. It is now possible to use the Beam Steering application to access the data.

After the insulation transformer replacement, source is now working at 85 keV. The new transformer is not foreseen before September.