ELENA:

Commissioning meeting Minutes

Date: 24/5/2018

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1 INTRODUCTION

T. Eriksson says that the minutes of the previous meeting have been accepted. They are available at https://indico.cern.ch/event/714643/

2 COMMISSIONING PROGRESS & NEXT STEPS

T. Eriksson says that the source has been running at 100 kV. The source is stable for about 4 hours then the sport on the injection BTV can start moving horizontally and/or vertically.

Pbars are used Monday, Wednesday and Friday until the end of July. So far several Pbar days have been lost due to dedicated MD in the injectors.

The E-cooler is fully installed and the safety electrical inspection has been validated. M. Dudek says that there are still some issues with oscillating power supplies that have to be solved.

Debugging of orbit and tune measurements with Pbars & H- beams have been done:

- Systematic inversion between the MadX sign convention and the polarities of steering magnets
- Orbit response is close to expectations
- Horizontal tune excitation did not work due to a broken "strip-line“. Now the opposite strip-line is used to excite the beam

• Optimisations of the first ramp with Pbars

• Working point adjustments

• Additional data are required in order to use Qh & Qv parameters of cycle editor. P. Belochiskii is working on extending the Qh/Qv mesh that is used in the cycle editor.

Tests of the scraper with Pbars & H- beams has been done, an error in the setting of the blade speed has been detected and corrected.

• A new software was deployed to debug the injection oscillation correction application

• RF cycles setting up

• Cavity loop, RF-trains, Phase loop, Radial loop etc.

• BTrain has been improved and it is now working. A fluctuation has been detected in the current coming from the power converter, more likely to be noise. This fluctuation could generate variations of 0.03G. Specified precision of the B-train system is 0.1G.

• H- beam is kicked out but cannot be observed in the transfer line to Gbar

Next Steps are :

- Electron Cooler
  • Compensation of the perturbations due to the electron cooler
  • Establish electron beam, can be done in parallel with circulating beam
  • Establish cooling (need pause on plateau)
- Extension of the working points accessible via trims from the cycle editor
- Working point optimisations
- Studies with the scraper
- Setting up of (pseudo-)adiabatic de-bunching at the intermediate plateau around 35 MeV/c
- Debugging the micro-wires in LNI line SEM. It may be a problem with vibrations breaking micro wires.
- Optimise deceleration cycle => efficiency, final emittances/lifetime.

3 ELECTRON COOLER STATUS&PROGRESS

L. Joergensen says that the E-cooler is ready to be switched-on. If everyone agrees it is foreseen to turn on the electron beam on Tuesday.

4 INJECTION COHERENT OSCILLATIONS CORRECTION

B Lefort presents a new software based on the work of C.Carli to minimize coherent oscillations at injection due to miss-steering.

The program is effective to correct the oscillations and also to estimate the tune at injection when oscillations are still non negligible.

5 ORBIT CORRECTORS KICK RESPONSE CHECKS

The idea was to verify the sign convention between ELENA MADX model and what is implemented in the machine.

FYI, Yasp is using the MADX model implemented in LSA to calculate kick response, orbit corrections etc.

The principle is that from an acquired orbit a response to a single kick can be calculated. After applying the kick to the beam it is easy to determine if a calibration factor should be applied or not.

In conclusion there was a consistent sign inversion between implementation and model (on both planes and on all the correctors). These new calibration factors have been saved in the YASP calibration files and orbit corrections have been successfully tested.

The new BPM:s of the e-cooler were inserted in YASP even if they are not used for correction yet.

6 AOB

The ion source insulation transformer has probably died. Further tests must be run in order to be sure. If it is confirmed, the old transformer for 85kV operations will be reinstalled. The new oil-bath based transformer is foreseen for September. We have to see if it is possible to have both the transformer and the tank before that date.