MINUTES

LIU-SPS BD WG
MEETING No. 12/18

18 December 2018

Present: J. Repond, M. Schwarz, E. Shashposhnikova, I. Karpov, G. Rumolo, N. Nasresfahani, D. Quartulo, P. Kramer, C. Vollinger, R. Calaga, T. Argyropoulos, H. Damarau, C. Zannini, W. Höfle

# Matter Arising and Follow-up of Actions

* **N. Nasresfahani**: Study the possibility to use the new coupler design to replace all existing 630 MHz HOM couplers
* **M. Schwarz**: Include the momentum acceptance limitation in simulations.
* **M. Schwarz**: Is it possible to understand if the instability observed with the radial-loop is real or only related to numerical problems?
* For the slip-stacking cycle, determined the aperture needed for the collimation system.
* A list of the key moments in the various cycles (slip-stacking!) is necessary to adjust the design of the collimation system.
* Measurements of the beta beating to include optics errors in simulation of the collimation system.
* Check the impedance of the new collimation system.
* **M. Schwarz**: Quadrupole oscillations are observed at flat bottom with the feedforward activated. Study where this is coming from.
* **A. Farricker**: Check with C. Zannini for the discrepancy in MKEs impedance.
* Calculate the maximum voltage in the 800 MHz RF system due to power limitations and beam-loading.
* **C.** **Vollinger:** Check how many cross section step-like changes are in the SPS

**New:**

* **M. Schwarz:** Organize meeting to discuss issues with bunch length measurements

# Presentations

## **Extra Matching Lines for New FPCs of SPS TWCs – N. Nasresfahani**

Now third generation of fundamental power couplers (FPCs) in SPS

* **Elena:** What is the difference between generations?
	+ **Rama:** Space optimization and better power reduction; matching is already done in FPC instead of matching line

Introducing two sliding lines allows to cure unexpected mismatches as well as providing a ‘starting position’ for reference measurements.

* **Elena:** What is the condition for ‘good matching’?
	+ **Nasrin:** -20dB reduction; presently only -10dB

## **Results of the latest synchronous phase measurement  – M. Schwarz**

Two sets of measurement data: one set manually acquired at three different days with 40GS/s oscilloscope, one set automatically by ABWLM

Sets differ in bunch length by 1ns! -> organize a meeting to discuss this discrepancy!

* **Theodoros:** Check for instability at high bunch lengths.

## **Overview of 2018 ion run – H. Bartosik**

First part of 2018 run used 12x4 injection scheme, second half used 14x3 injection scheme

* **Rama:** Why not inject 10s later?
	+ **Hannes:** Present timing scheme does not allow this.

Average intensity per bunch is already at LIU design value, but total intensity per LHC ring is not there, yet. Slip stacking is needed to reach required intensity per ring.

800 MHz cavity was used to stabilize the beam, but no beneficial effect was observed.

## **Longitudinal stability of ions – T. Argyropoulos**

Ion beams suffered from instabilities and emittance blow-up after transition crossing. Improving transition crossing gives less blow-up, but creates instabilities later.

* **Heiko:** Why was 300 GeV chosen for transition crossing?
	+ **Theo:** It was chosen based on the limited data we had at the time
	+ **Elena:** You also have to be sufficiently far away from transition crossing.
* **Elena:** Simulations with present SPS impedance model do not show instabilities?
	+ **Danilo:** I used a distribution matched after transition crossing.

Radial displacement of up to 18mm did not lead to visible BCT losses -> allows to only displace one beam during slip stacking.

## **End-of-year summary – E. Shaposhnikova**

## **Lavish End-of-year party – All participants**

To protect people’s privacy, whatever happened at the lavish end-of-year party will stay at the lavish end-of-year party.

# Next Meeting xx January 2019

Minutes written by M. Schwarz