MINUTES

LIU-SPS BD WG  
MEETING No. 01/19

17 January 2019

Present: A. Lasheen, G. Papotti, E. Métral, M. Schwarz, E. Shashposhnikova, C. Vollinger, J. Repond, A. Farricker, I. Karpov, N. Nasresfahani, T. Argyropoulos, H. Damarau, H. Bartosik, W. Höfle, K. Li, V. Kain,

# 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
* **M. Schwarz:** Organize meeting to discuss issues with bunch length measurements
* **T. Argyropoulos:** Include intensity effects in emittance calculations

**New:**

# General News

The LIU project was restructured and consists of ‘technical coordination’, ‘construction’ and ‘beam dynamics’.

# Presentations

## **The Vlasov-solvers GALACTIC and GALACLIC and applications to longitudinal mode-coupling instability & A two-mode model to study the effect of space charge on TMCI in the long-bunch regime – E. Métral**

Both Vlasov-solvers use the **GA**rnier-**LA**clare method to solve the linearized transverse/longitudinal Vlasov equation. New simulations revealed a destabilizing effect of space charge in the SPS.

## **Updates on 10s long flat-bottom simulations – M. Schwarz**

Simulations of flat bottom now use MPI version of BLonD (developed by K. Iliakis) -> computation time reduced from days to one hour

First simulations with 12 bunches show reasonable agreement with measurements, but simulated threshold seems to be too high -> further investigation ongoing; need to simulate with initial distributions matched to the measured profiles on a bunch-by-bunch basis

## **Effect on beam stability of 200 MHz voltage reduction – J. Repond**

New HOM damping scheme reduces available V200 from 10MV to 9MV; study is the effect on stability threshold

Reduced V200 allows to increase V800/V200 ratio at flat top and increases stability threshold

* **Patrick**: Where does the lost power go? Is it absorbed by HOM coupler or the load?

## **Beam dynamics requirements after LS2 – E. Shashposhnikova**

Ion beam has bad transition, but when improving transition crossing, beam becomes unstable at 300GeV, which is the energy for slip-stacking.

* **Heiko**: Would blow-up during flat bottom be an option?
  + **Elena**: No, because of increased flat-bottom losses for larger emittance

# Next Meeting 21 February 2019

Minutes written by M. Schwarz