PSB Beam Dynamics Working Group meeting, 15 Dec. 2017

Link to indico

Participants: Antoniou Fanouria, Bartosik Hannes, Forte Vincenzo, Guidoboni Greta, Di Giovanni Gian Piero, Koukovini Platia Eirini, Rijoff Tatiana Libera, Rumolo Giovanni, Santamaria Garcia Andrea, Zisopoulos Panagiotis

Approval of minutes:
Minutes were approved without comments

Status of the PSB Impedance Model (Tatiana Rijoff) (Link)
Tatiana presented the status of the impedance model for the PSB based on theoretical calculations and comparison with measurements. The aim of this study is to identify the main impedance sources of the ring and construct a realistic model. The model includes the resistive wall, indirect space charge, step transition, injection and extraction kickers. The most important contribution to the total impedance is given by resistive wall and extraction kicker (for real impedance), indirect space charge and step transition (for imaginary impedance). The model includes the Finemet cavities and the tune pickup. The update of the model with the new scraper and wire grid detector is currently under development. Comparison of the tune shift with intensity predicted by the current model and measurements from 2016 shows good agreement.

Discussion:

- The fractional part of the tune used was 0.2 but this is the extraction tune. This should be revised. Action on Tatiana
- The studies are done for the shortest bunch and assumes a parabolic bunch.
- The assumption for the calculations is that we have circular chambers. Action → Check which elements are circular and which are not and take this into account correctly to see the impact
- Injector kicker → Assumption of R=0.3 Ohm. In the past the information for the thickness of coating was not existing. However the results were crosschecked with measurements
- Total impedance: The horizontal is higher than vertical. Most important part of imaginary part at lower energy and real part in higher energy
- Imaginary part: Most important part comes from space charge
- Chromaticity used: -0.95, -2.1. Action → Verify if those values are correct (comment by Vincenzo)
- Comment by GP: Wire Grid Detector → This will be installed only in R3. To be taken into account.
- Giovanni: How much is the contribution of the extraction kicker connection with the external circuits? → Tatiana replies that this is minimal
- Giovanni: When were these data taken? → Those are from 2016. Consistent results were observed also in 2017. Action to Tatiana → To be verified
- Tatiana: She is working on the analysis of 2017 data and she will be back to present the results.
- From the agreement of the data with the model predictions it seems like the model for the transverse plane is quite complete.
- Eirini: Can you predict the instability rise time?
- Vincenzo: Why did the data points stop at 350E10 ppb? For higher intensities, the data was not clean and she had to reject the data. For next year the data should be taken with a different type of beam (ISOLDE beam)
- Panos: Were the tune measurements with the BBQ? → Yes

PSB Beam Dynamics Working Group meeting, 15 Dec. 2017

- GP: Should we check the models at different energies as well? → Yes, to be done next year.
- GP: This is transverse plane. Where the input from the longitudinal plane should come from? The longitudinal studies colleagues should take care of the update of the long. plane
- Vincenzo: Would you like to scan different chromas and Energy? → Yes! More MDs are planned for next year
- GP → Next year will be very busy with MDs. We should make the plan and prioritize from the beginning of the year.
- GP: We are maintaining a repository for codes. But this code is committed in ABP repository for impedance studies, just to make sure that the work is maintained.
- Hannes → Something about the instability observed? Tatiana is analyzing the data from Meghan. Trying to recollect the information from the past and construct a database.
- Vincenzo: Can we have some information from the tune scans? To be checked by Eirini's studies.
- GP: This is a very important study for the commissioning of the transverse FB as well.
- Eirini: How about the data-model comparison for the other rings? → No big difference for the other rings but the results are best for R3. Action to Tatiana → Provide the plots for the other rings as well