**SPSU-BD meeting on 24/11/2011**

**Present:** Alexey Burov, Heiko Damerau, Chandra Bhat, Theodoros Argyropoulos, Helga Timko, Mauro Taborelli, Elena Shaposhnikova, Roland Garoby, Fritz Caspers, Brennan Goddard, Yannis Papaphilippou, Hannes Bartosik, Giovanni Rumolo, Benoit Salvant

**SPS MD summary (Nov. 7th and 9th 2011): 25&50ns in Q20 and Q26 optics - Hannes Bartosik**

Summary:

Hannes presented the optics studies of the beam dump position in the Q20 optics that validated the possibility to perform the MD following the reduced voltage available on the MKDV kicker. He also mentioned the studies that enabled to identify and reduce losses next to the ZS.

For 25 ns beam (Nov. 7) only 2 batches were injected and emittances at injection were similar in both optics.

For 50 ns beam (Nov. 9) it became clear that optimum RF parameters found for the nominal optics cannot be easily scaled to the Q20 optics. A lot of time is needed for setting up. One of the vertical transverse dampers didn’t work properly. The transverse emittance measurements were not as reliable as during the 25ns MD.

Discussions:

* Losses during the first 10ms are not accounted for in the transmission measurement.

Action: need the PS- SPS BCT cross-calibration and understand these losses (tbd)

Action: comparison of space charge effect in Q20 and Q26 (H. B. and A. B.)

* There have been problems with emittance measurements. The spread for wire scanner 519 is a factor 4 bigger than the spread for wire scanner 416 (due to the small number of points at top energy). The measured spread is also bigger in the Q20 optics.

Action: assess the impact of dispersion on emittance measurement (dispersion beating). (H. B.)

* 2 MKE kickers will be changed in the winter stop, and the remaining shielded kicker will be changed during the LS1.
* Yannis will also check the Q20 for IBS. Alexey B. has doubts about a positive effect on IBS. -> Action (A. B. and Y. P.)
* There are also possible gains from Q20 for the fixed target. Elena reminded that FT/CNGS cycle in the SPS is a fast cycle and needs maximum voltage for acceleration. -> Action (E.S.)
* Brennan asked why there are losses next to ZS?

Action: investigate losses next to ZS. Losses were only observed in Q20. A bump was made and it resulted in 3% improvement.

**RF measurements during long MD in Week 45 - Theodoros Argyropoulos**

Theodoros summarized the longitudinal studies during MDs with 25 ns and 50 ns beams.

For the 50 ns beam in Q26, improvements were observed by increasing the voltage ratio V800 /V200 to 0.15, but longitudinal emittance blow-up is still necessary to avoid instability. For the 50 ns beam in Q20, further optimization is needed (in particular of the Longitudinal Damper settings). However, quadrupole oscillations could be suppressed at flat top after optimization with 1 batch. Dipole oscillations were not always acceptable. The instability threshold is higher in the Q20 optics than in the Q26. At 1.9E11 p/b, both optics were unstable and time is needed to set up the controlled emittance blow-up for both cycles (optics).

For the 25 ns beam, stability is also better in the Q20. Again there is a need for the 800 MHz RF for both cycles.

Discussion:

In the Q20 with low voltage settings after injection bunches were very round (close to a water-bag distribution). It is possible to inject almost with matched voltage without losing beam due to beam loading.

Action for Helga: inject in smaller voltage.

Future MD strategy: concentrate now on optimization of Q20 cycle and not comparison with Q26 cycle.

**PS to SPS Transfer Studies - Helga Timko**

Helga revisited past MDs and compared measurements with ESME simulations of PS splitting, bunch shortening, rotation and SPS capture. ESME simulations reproduce well the trends observed in the PS-SPS experiments. The simulations confirm that for this RF gymnastics transmission only depends on emittance, and not on bunch length.

Action: understand why simulated bunch lengths are systematically lower then measured (H. T.)

**Wish list for instrumentation - Benoit Salvant**

The list of improvements needed (or wished) for the SPS upgrade with the priorities was presented.

The next (last this year) meeting: on December 19 2011

Minutes by B. Salvant