**SPSU 15th Sept**

Theodoros Argyropoulos, Alexey Burov, Juan Esteban Muller, Helga, Elias Métral, Joachim Tuckmantel, Brennan Goddard, Thomas Bohl, Nicolo Biancacci, Elena Shaposhnikova, Roland Garoby, Mauro Taborelli, Holger Heupert, Hannes Bartosik, Yannis Papaphilippou, Fritz Caspers, Heiko Damerau, Jonathan Emery, Ana Guerrero.

Elena informed that reviews organized by LIU-SPS should take place by the end of the year on several subjects.

Benoit looked at the list of actions for the past meetings and compiled these in a list.

**Ana Guerrero: transverse emittances ([slides](http://paf-spsu.web.cern.ch/paf-spsu/meetings/2011/m15-09/MD.4thJuly.Emittance.pptx))**

*Summary:*

Following systematic vertical emittance measurements in the PS and SPS which showed large variations from cycle to cycle, Ana reminded that there are many sources of errors and recomputed the emittance offline from data logged in Timber with several fit methods (in particular accounting for data up to +/-2 sigma or up to +/- 20 sigma, or all data). Changing the fit method may already result in a 20% difference of computed emittance. She also noticed signs of saturation in SPS and low signal to noise ratio in PS. These signs are subtle and it is therefore important that an expert is there to obtain reliable emittance results.

The average vertical emittance for 4x36 bunches at 50 ns was measured for Q26: εy,n=1.40 mm.mrad, and Q20: εy,n=1.45 mm.mrad (with injected PS vertical emittance=1.45μm, and the doubtful smallest emittance measured in the SPS = 1.0μm).

*Discussion:*

There is a yet unexplained decrease in vertical emittance in Q26 multibunch with last year (3.5 mm.mrad for 25ns last year and 2.5 mm.mrad this year). Ana said that nothing in the measurement was changed that could explain this difference.

Yannis mentioned that PS vertical chromaticity was negative at extraction before a correction was done this year. Elias said it is a difficult process to crosscheck all machines. As an example: 10% increase in intensity yielded 50 % increase in emittance.

For the fit, Alexey said that in Fermilab, they cut at +/-3 sig rms for the Schottky and the wire scanner.

The measurement in coast of Elias shows a smooth increase in vertical emittance. Is it physical?

Jonathan said there will be a follow up in the MSWG.

Roland stated that there is a need for a consistent way to measure emittances across machines by the end of 2012.

Ana confirmed that the raw data is now stored automatically to LDB. A common fit for all machines is planned for long term.

Ana said that the electronics will be soon changed.

A comparison between SPS, TI8 and TI2 and LHC was done last year. SPS and LHC comparison was done by BI this year.

Actions:

* Need to define the suitable fit algorithm and propagate it consistently through all machines.
* Need to put error bars with the displayed emittance
* Need to log all relevant data in database to be able to reconstruct the emittance (under way)

**Thomas Bohl: Q20 longitudinal measurements (**[**note**](http://paf-spsu.web.cern.ch/paf-spsu/meetings/2011/m15-09/Note-2011-43_Q20_25ns.pdf)**):**

*Summary***:**

During a difficult dedicated Long MD in week 35 (2.09.2011), Thomas measured the longitudinal beam parameters for 72 bunches at 25 ns in Q20. A new voltage program for 200 MHz and 800 MHz RF as well as different gain settings of longitudinal damper were implemented. Bunches with 1.1e11p/b and 0.4 eVs on flat top were observed to be at the limit of stability without controlled longitudinal emittance blow-up.

Thomas added that the Q20 longitudinal beam parameters were surprisingly good at flat top.

*Discussion*:

Heiko said that the pattern could be adjusted.

Thomas showed that two bunches were slighty unstable longitudinally. Bunch length looks good but measured bunch-by-bunch phase is at the limit of instability.

Would these small emittances (0.35 eVs to 0.4eVs) be acceptable for LHC (IBS, stability)?

**H. Neupert: Ecloud measurements during last SPS MDs (**[**slides**](http://paf-spsu.web.cern.ch/paf-spsu/meetings/2011/m15-09/SPS_U_20110915.pptx)**)**

Summary:

Mounir Mensi takes over the job of Cristina.

E-cloud measurements in Q20 cycle were taken after 10 pm or 11 pm. A little bit more e-cloud was observed in Q26, but it is difficult to compare (2 and 3 batches, different beam sizes…). Always one stripe is observed but with different pattern for the two optics.

For a 50 ns beam, in the carbon coated liners there is almost no e-cloud, the same for the half-coated (bottom), but in the stainless steel liner there is a significant e-cloud signal. Only a factor 20 difference is observed between half coated and Stainless Steel for LHC25ns, while the full carbon coating gives a suppression factor of 1E4. 🡪 Coating half of the vacuum chambers is probably not enough.

Similar e-cloud pattern for half coated and Stainless Steel: the conditioning slope seems similar.

There was no news for pressure in coated magnets.

Action:

* Measurements with similar beam conditions for Q20 and Q26.

**Benoit Salvant: MKP impedance (**[**slides**](http://paf-spsu.web.cern.ch/paf-spsu/meetings/2011/m15-09/SPSU15thSeptt.pptx)**)**

Summary:

Good results were obtained when comparing transverse impedance simulations and single wire measurements for the MKP kicker.

Discussions:

B. Goddard asked whether this impedance could be improved, but the ferrite length is very short so that painting is ruled out. A. Burov said that the laminated kicker in Fermilab could be shielded.

Action:

* The impedance of the MKDH should be measured.

The next meeting will be on 13th October.

B. Salvant