

# LHC RF Meeting

19th August 2008

**Participants:** DV, MEA, EM, WH, Ech, TB, TL, EC, AB, OB, JT, PhB, UW, VR, LA, PM

## 1. UX45 status & planning

- ✚ 16 cavities conditioned to 2MV, 300kW. 4 cavities LL loops setup.
- ✚ Plan: 4 more cavities this week, consolidation of controls and software. LabView/FESA more or less OK now. All calibrations seem to fit together. Some couplers have 8 or 9mm difference in position for  $Q=60000$ . Correspond with measurements made in SM18. Full range of  $Q$  available. Most within 3 or 4 mm. Not understood, Eric & team will check potentiometers.  $Q=60000$  is used for setting up, should move to 100000 for beam operation. 8MV fixed, maybe 16MV for first capture.
- ✚ Phasing between cavities: use 1 cable to measure each Antenna 2 in turn. Cable lengths inside cryostat are all the same? Otherwise phase shift different between cavities.
- ✚ Commissioning time is very limited. Can we ask a derogation to have access during the sector test?
- ✚ 4 cavities in Beam 2 commissioned, next 4 will be in Beam 1. We can survive with 4 cavities per beam.

## 2. LLRF

- ✚ Frequency programme: 1 module, Joao. Noise from 20MHz bunch synchronous clock on 10MHz on backplane.
- ✚ Synchro module: some modules FPGA overheating. New series ordered (v2).
- ✚ VCXO: still issue with thermal drift, but OK for startup.
- ✚ Phase loop: Card, beam simulator there, firmware finished, first noise measurements: 1.1 deg RMS, half from beam simulator, so probably 0.6 on card, single shot, 1 bunch, should improve with averaging. Similar HW for beam position, in lab, must measure noise performance. Software is there, ready.
- ✚ Phase loop production: enough modules for RF already, ADT nearly enough commissioned.

## 3. ADT:

- ✚ DSPU: 3 cards tested by Gerd. If the 4th card works, we can run both planes both beams. Some debugging remains on position measurement card.
- ✚ 16 amplifiers in production.
- ✚ Need to connect the BI tune measurement input. Reinier is making a protection switch to disable this via timing.
- ✚ Absolute priority is now the acceleration system

## 4. Software and controls:

- ✚ We are now having regular meetings for SW issues. The system is becoming stable.

## 5. SM18:

- ✚ Last module in bunker, will be presented during inauguration ceremony. Cryo: 4 weeks of cold from week 39 to 42 and 6 up to Christmas. Not enough to fully check spare module, will continue into next year.

## 6. Beam commissioning

- ✚ Beam commissioning will be done from Pt4. Signals from Beam Control & Cavity Low Level will be available via OASIS before 10 Sep.
- ✚ Synchrotron frequency measurement: Injection oscillations or kick should last at least 5 synchrotron turns.
- ✚ Ramping one beam to 5TeV is not more complicated than capture. However rephasing to stable 40MHz will not ready before Sep/Oct.

## 7. AOB

- ✚ Injection test ring 1 very successful.

- ✚ LHC cryo upgrade for RF proposed for LHC upgrade phase 1, will be shared with LSS magnets.
- ✚ Ions: Stephane Maury: LHC ions in 2009? Ions in SPS foreseen for June 2009. Should be possible in terms of manpower, Joao will finish LHC frequency programme in October. Need extra budget: full ions operation budget?
- ✚ Daniel: cabling issue: a lot of time lost due to connector problems (mounting and tightening). No record of who mounted each connector. Should be traceable and checked by responsible engineer at the end of the cabling campaign. TS/EL have poor quality control.

A. Butterworth, 27th August 2008