Status of the FMCM Installation and Production

&

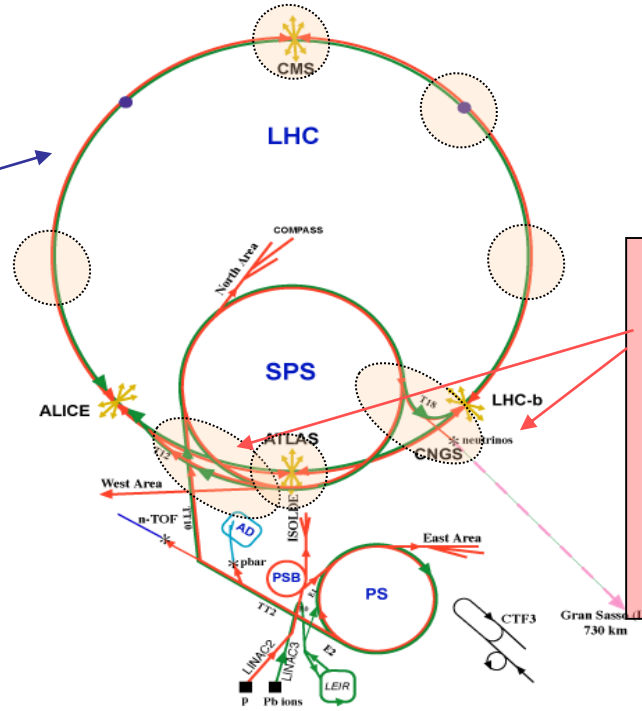
Some First Test Results from CNGS

Acknowledgements: A.Dinius, R.Genand, K.Fischer, M.Jonker, J.Wenninger, A.Gomes Alonso and many others…

Progress so far….

LHC

- D1 in IR1 and IR5
- Dump septa in IR6
- RD34, RQ4, RQ5 in IR3 and IR7

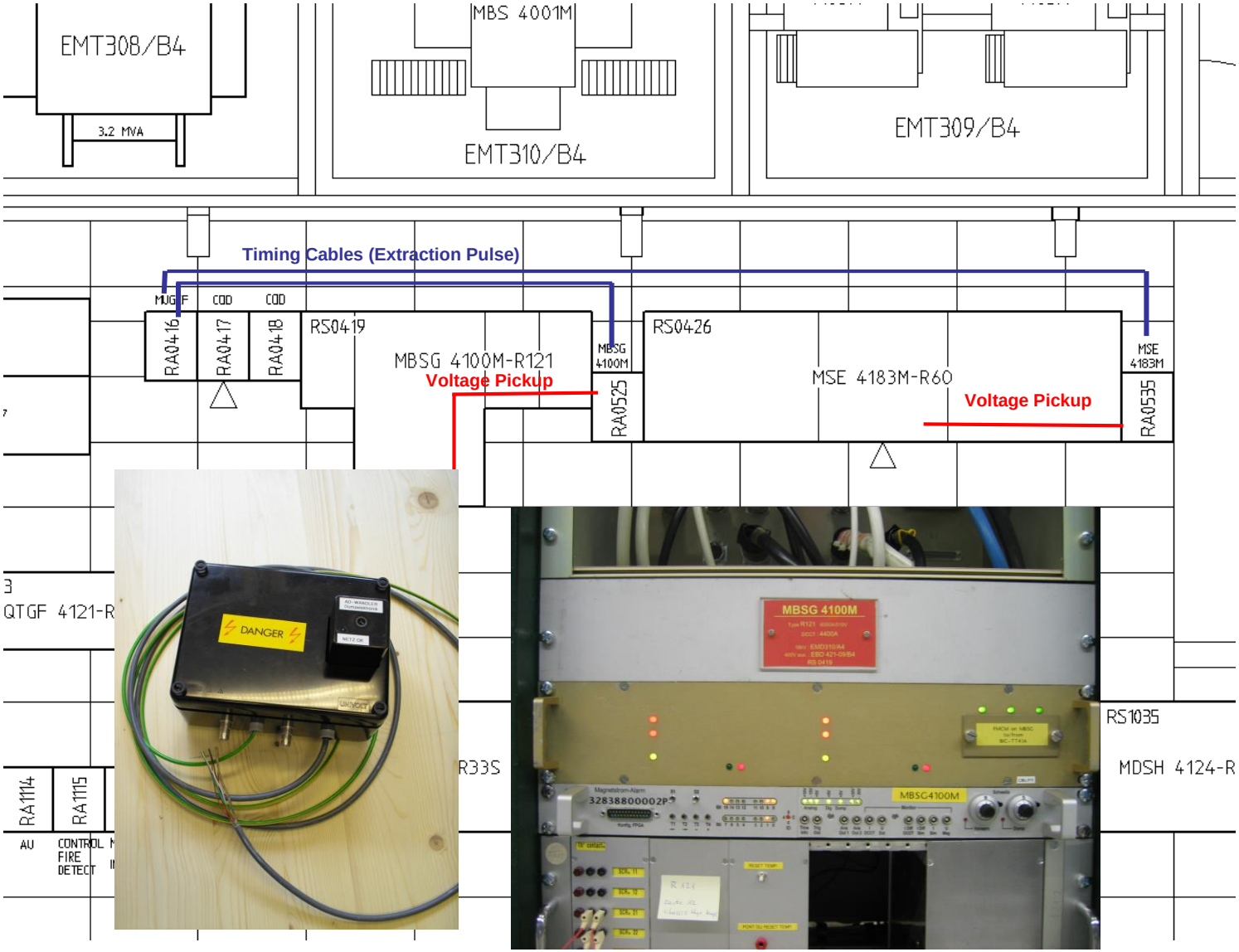


TI2, TI8, CNGS, TT41

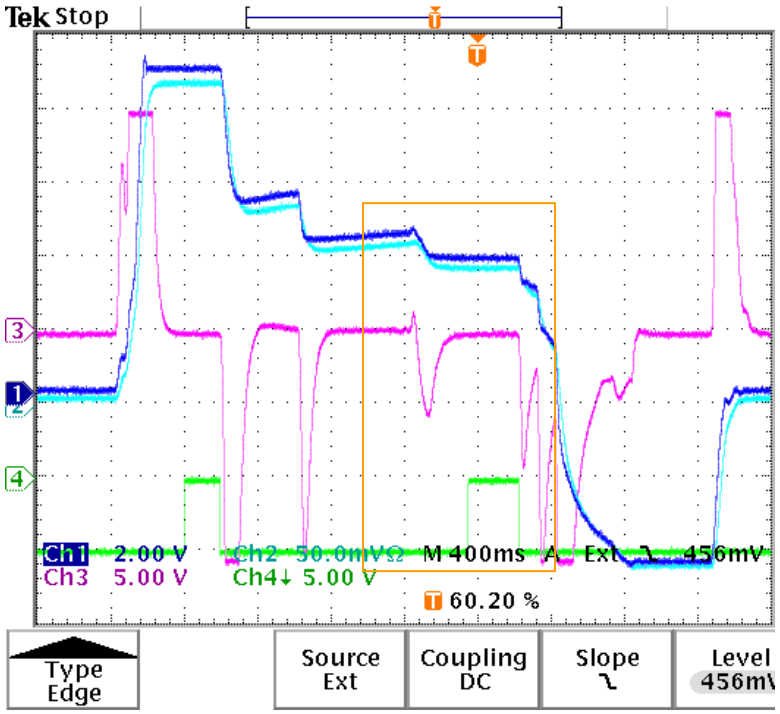
- Septas (**MSE**, MSI, MST)
- MBB, **MBG, MBSG**
- MBI, MBHC
- MBIBH…

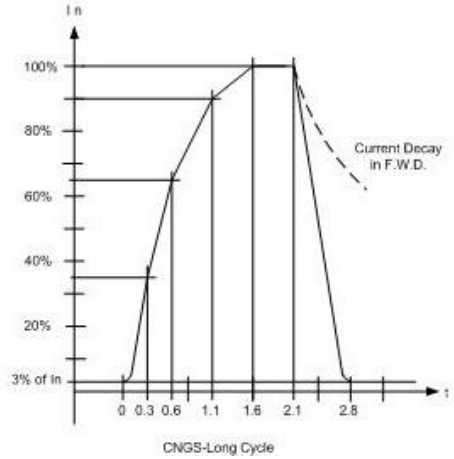
- ➔ Three FMCM units (DESY version) out of the final 25? (see future presentation of A. Gomes Alonso) have been installed and commissioned in the last weeks for CNGS operation
- ➔ Covering the most critical circuits, namely the extraction septa, the switching magnet and the main dipole chain
- ➔ First encouraging test results

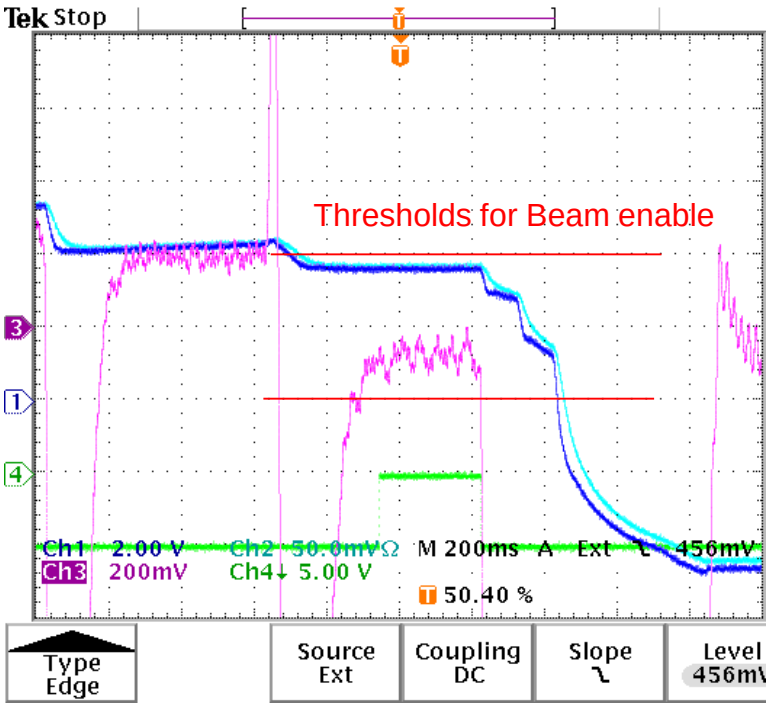
Installations in BB4



First Results – MBG 4101M

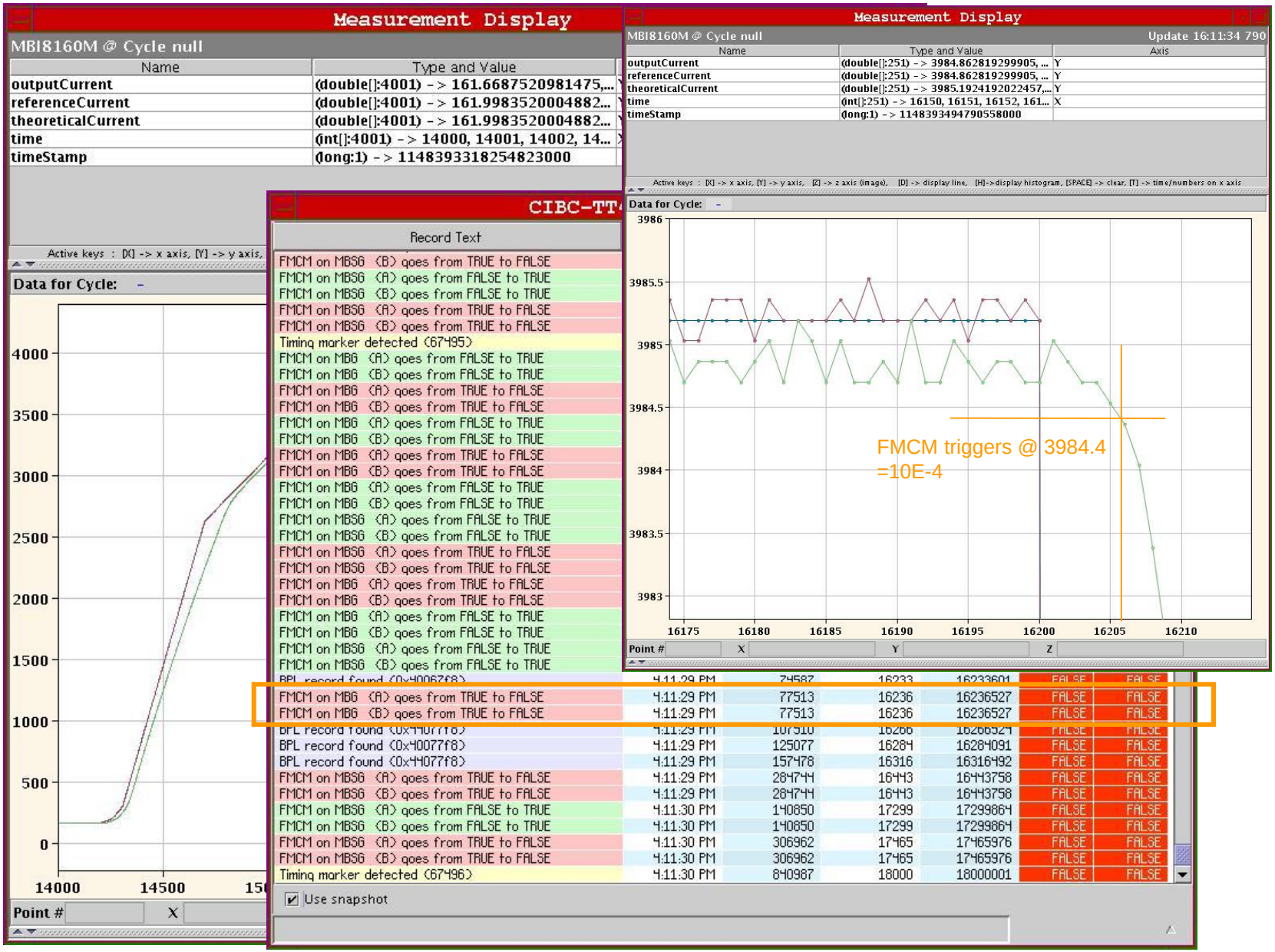




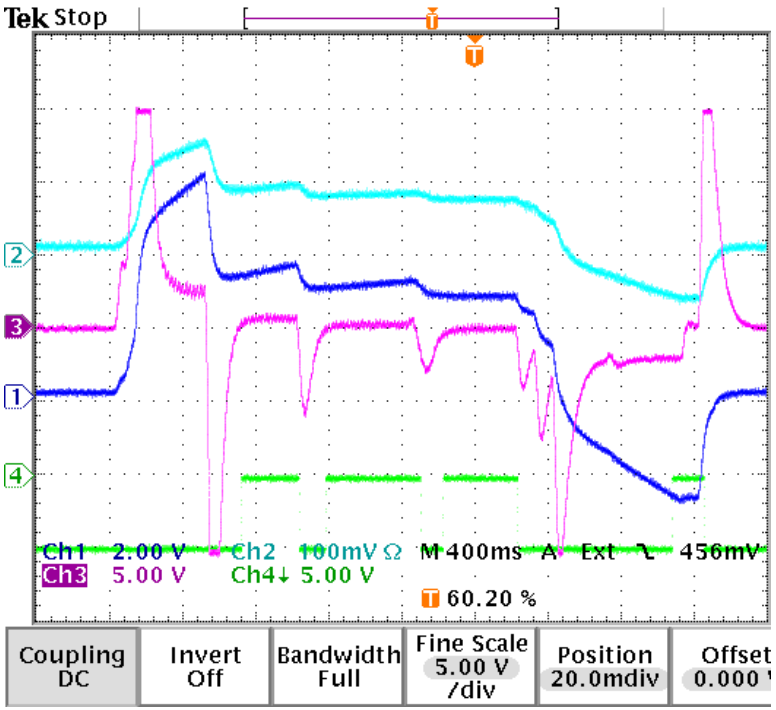


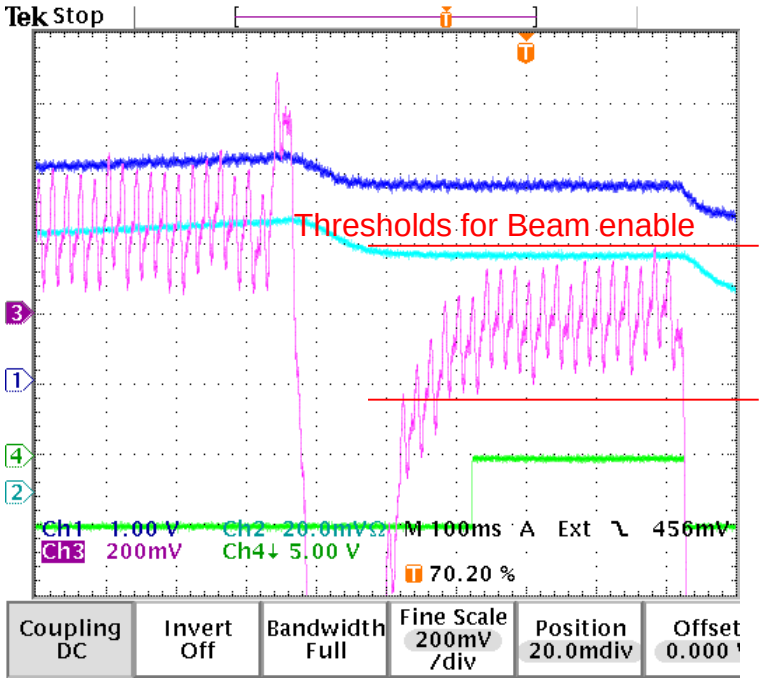
(Light) Green: Dump signal towards the CIBU
Dark Blue: U pc out
Light Blue: I sim (Calculated & filtered)
Magenta: I diff sim (Calculated & filtered)

MBG 4101M – Current Step of -1% on Flat Top



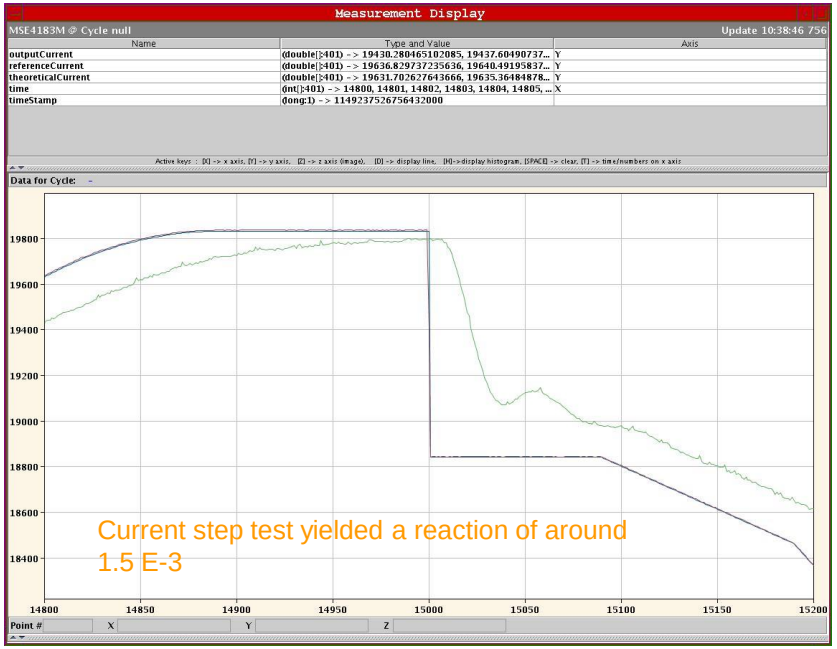
First Results – MBSG 4100M

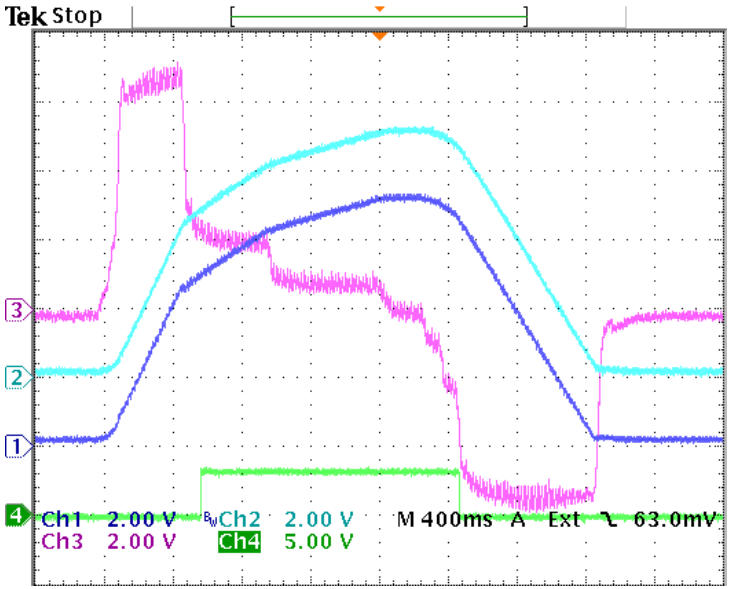


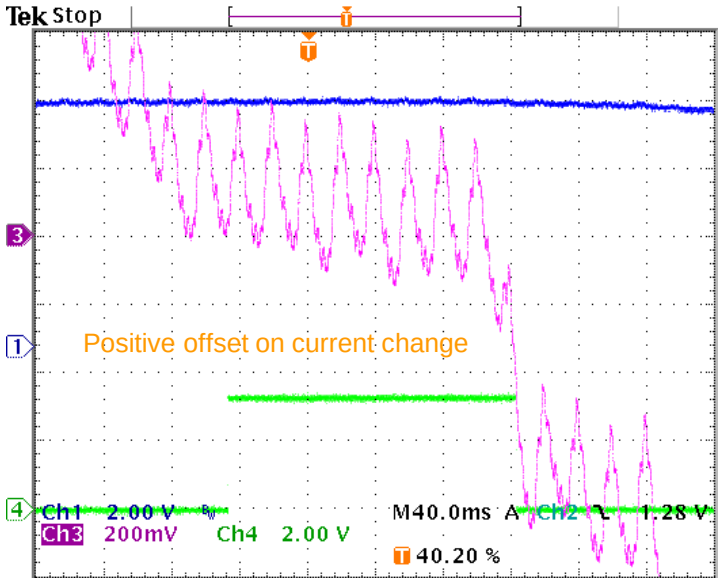


- Same Test as for MBG performed (with 3% current step)
- Current change of 0.4A / 3069 detected (equals 1.3E-4)
- Reproducible enable signal from one extraction to the next one

First Results – MSE 4183M







Summary

- FMCM functionality validated for cycling magnets
  - CERN solution of Voltage Divider and Isolation Amplifier validated
  - Drawback are multiple extraction enables during ramp up (BIC history)

- Reproducible extraction windows for all three installations

- MBG and MBSG have low noise level, thus very tight windows possible
  - Results with current threshold 0.1‰ for MBG (0.6 ‰ required)
  - Results with current threshold 0.13‰ for MBSG (1.0 ‰ required)

- MSE noise comparable to MBG and MBSG, but cycle not yet optimized
  - Positive offset limits the threshold window to 0.4 (factor 2 to gain)
  - Results with current threshold 1.5‰ for MSE (2.0 ‰ required)

Minor hick-ups experienced and required follow up

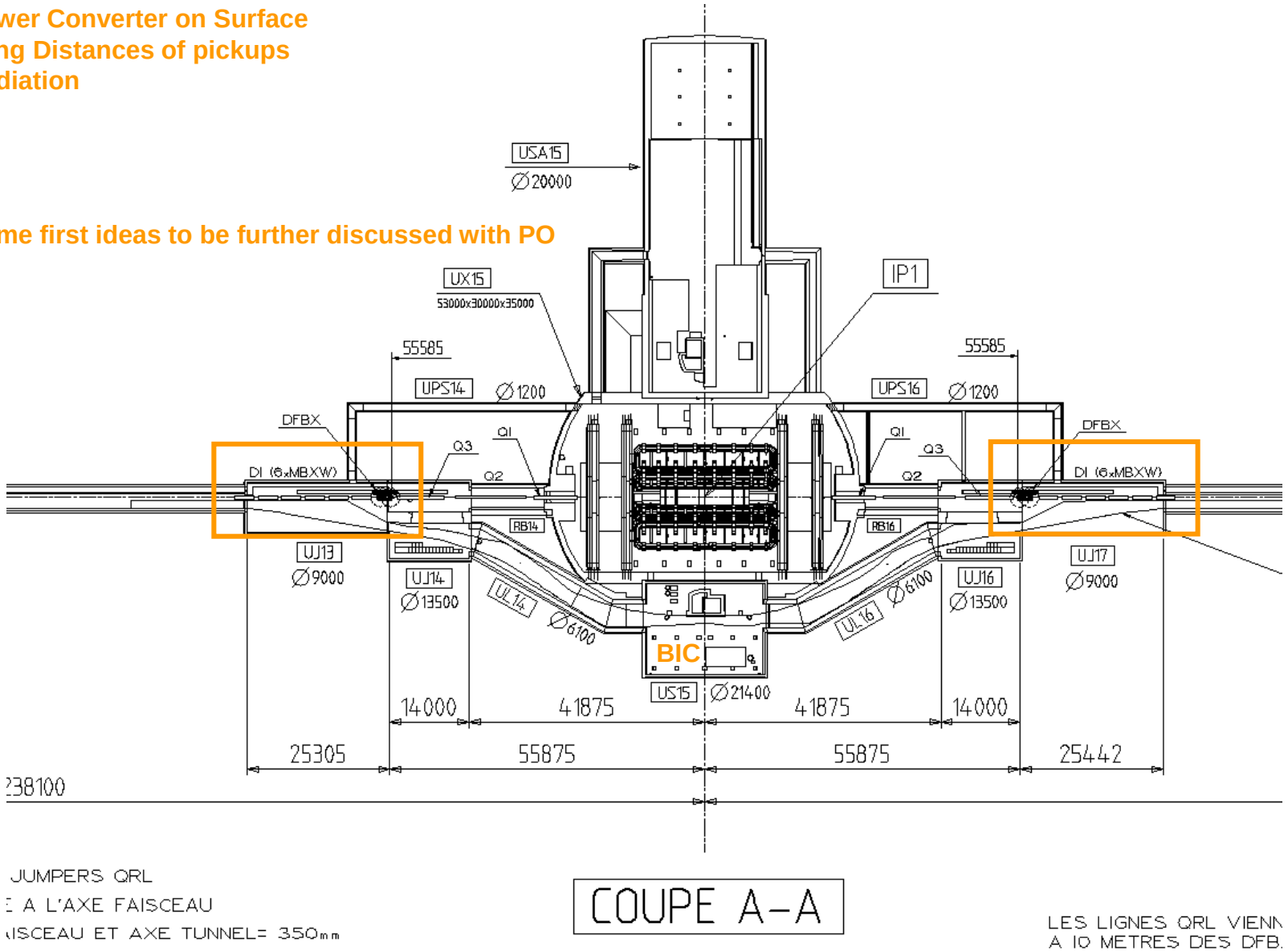
- Cabling requests done with too short notice – cables had to be put by ourselves
- Voltage pickup misplaced in first installation (before passive filter) – difficult to get data on ‚old' power supplies
- After installation one of the wires in the cable FMCM-Voltage Divider was in open circuit

- Timing signals from MUGEF
  - pps pulse and extraction pulse needed by the FMCM for PM aquisition; not yet clear if enough free channels to provide these signals
  - Timing channel only with extraction pulses (PM of inhibited extractions)
- CNGS ramps and MSE ripple
  - Cycles and extraction pulses have been changed by PO with respect to specification – more noise and offset at extraction
- Cabling for future installations
  - Preparation of LHC and remaining SPS installations have started
  - Some integration questions remain open and might require some further simulations in collaboration with PO (D1 magnet)

Layout for RD1 circuits in IR1 and IR5

Power Converter on Surface
Long Distances of pickups
Radiation
....

Some first ideas to be further discussed with PO



Status of design and production

- Production of Voltage Dividers and Amplification Amplifiers at CERN well advanced (15 units of HV and 20 units of LV type)
- Re-design completed according to the specification delivered by CERN
- DESY workshop has started the layout of the new board
- Official offer for the re-design and production at DESY should reach CERN any day
- To be integrated in the draft of the Collaboration agreement
- Finalization of the design and Agreement during a possible visit in July