

Minutes of the 76th WP2 Meeting held on 02/09/2016

Participants: G. Arduini, N. Biancacci, X. Buffat, R. Corsini, R. De Maria, D. Gamba, M. Giovannozzi, G. Iadarola, T. Lefevre, E. Métral, B. Salvant, R. Tomas, F. Van Der Veken.

Minutes, Follow-up of Actions, General Information (G. Arduini)

Minutes of the last meetings have been approved, besides a clarification needed from Kevin and Wolfgang and small corrections from Elias. They will be circulated after the reply.

During the last TCC meeting a BPM design with shielding and shielded interconnections has been endorsed for studies. Thibaut said that there are today designs needed: for Q1 (small aperture), for Q2-D1 with and without shielding. BI team will evaluate the cost of the design and the different installation scenarios and report to the TCC.

The next relevant events for the HL-LHC project are the C&S review, E-Lens review and HiLumi annual meeting. For the latter the program is being adjusted in the parallel sessions. The list of participants has been approved.

The TDR is in the process of being written and Chapter 2 will be sent soon to the editors. Gianluigi thanks the authors of the contributions of the TDR. Riccardo asked if it will be possible to read the other chapters and informed that the circuit expert asked a feedback on the circuit table. Gianluigi replied that is expecting the editors to check possible inconsistencies but he will send the Chapter to the other WP leaders for potential feedback.

Update on the impedance of the stripline BPMs (N. Biancacci)

Nicolo` presented an update on the impedance estimates from the BPMs. The structure used were provided by BI and assumed a distance between striplines of 112 mm and 123 mm. The geometry has probably to be adjusted to the latest beam-screen size. Thibaut comments that the mechanical design will be revised, but with no expected impact in the impedance. Thibaut will provide the impedance team with the updated drawings once they will be available. **Action: Thibaut.**

The stripline is the main source of impedance. Nicolo' found a discrepancy between theory and simulation that were in agreement in the past that needs He believes that there is likely a mistake in the latest estimate and he is investigating.

The transverse impedance is not a concern when compared to the total HL-LHC impedance. Unexpectedly the longitudinal impedance amount to 10% of the total one, but it looks to be inconsistent with analytical estimations. Nicolo will verify the estimates. As soon as new design will be available new simulations will be performed.

Update on layout and optics (R. De Maria)

Riccardo gives an update on the layout and optics following the re-baselining.

In terms of layout, the changes in IR1/IR5 are in the triplet layout (position adjustment to fit the BPM outside the blind area), TAXN-D2 (following a study on vacuum elements, but still to be finalized with new collimator tanks), 2 crab cavities per side/beam/IR removed (but with backward compatibility), 2xMCBYY+MQYY to be replaced by an 4xMCBY+MQY slightly moved towards the arc, Q6 at 4.5K. In IR6, the 2xMQY is replaced by an MQY at 1.9K.

The new layout will be based on the LHC LS2 layout that includes the TCLD collimators in IR7/Q8 with MBH and in IR2/Q11 in the empty cryostat. Other layout changes that may come from the D2 assembly and the IR8 minivan will not be included in this version.

The new optics baseline is 20 cm for round (to be compatible with the worst case aperture in the triplet) and 15/40cm in the triplet (limited by Q4). The analysis of the strength required for the Q4 correctors is ongoing in order to assess whether this is compatible with operation at 4.5 K (it must be noted that Lucio has so far required to keep open the possibility to change the crossing plane in IP1 and 5 although this would require intervening on the crab cavities).

The next step is to provide a complete model of the layout and optics (with aperture and field imperfections) to allow studies and follow-up the optics developments. For the optics developments a squeeze in IR6 with better phase advance needs to be studied based on the solution proposed by Stephane for the LHC ATS optics). The β^* reach for flat optics and the possibility of operating both Q5 in point 6 to 4.5 K needs to be studied too.

Reported by Gianluigi, Riccardo and Rogelio.