Minutes of the 50th WP2 Task Leader Meeting held on 12/06/2015

Participants: G. Arduini, R. De Maria, M. Giovannozzi, E. Metral, E. Todesco, A. Valishev.

Minutes, Follow-up of Actions, General Information (Gianluigi)

The preliminary agenda of the summer meetings will be circulated based on the availability of the participants.

Gianluigi started to contact WP leader according to actions reviewed last meetings.

Riccardo reported on the integration meeting that took place in the morning:

- There is a request of to review the order of correctors Q4 to accommodate slopes of the tunnel instead of mirror symmetries.
- There is a request to review the need to operate Q6 at 1.9 K vs. 4.2 K. Operation at 4.2 K would not require modification of the assembly but could reduce availability according to S. Claudet.
- There is a request to use the space between Q4 and Q5 for the installation of the DFBM. We should check whether this interferers with the installation of BBLR compensator or tertiary collimators (Stefano has been informed). **Action: Task Leaders.**
- (Not reported in the meeting) Attempt to have L*=22.67 to accommodate all BPMs outside blind area has started.

From the collimation meeting there was a talk on the stroke requirements for TCT, showing how the present stroke compares to the HL-LHC requirements for baseline and alternative optics and compared to D2 aperture potential.

Review of field quality requirements for HL-LHC new magnets (M. Giovannozzi)

Massimo reviewed the simulations scenarios, parameters and the error tables. From simulations the following request were identified:

- D1 injection error table is fine. D1 top energy: b7 from 0.4 to 0.2 and b9 from -0.59 to -0.295.
- Q5 field quality was extracted from the LHC statistics (Ezio noted to no mean multipoles are present at top energy). Q5 field quality could be now taken from existing MQY since the exchange policy between old Q4 to new Q5 has been worked out**. Action: Massimo to contact Herve and Paolo to get the list of magnets that will be installed at the Q5 positions in IR1 and 5.**
- For D2, the error table v5 is acceptable.
- For the triplet flat top, a set of new random and uncertainty and mean of b10 and b14 is requested starting from the table IT_errortable_v66_4: b10m*0.4, b14m*0.25. For injection the error table v66_4 is acceptable.
- For Q4, the table Q4_errortable_v2 is acceptable.

Overall the minimum DA is approaching 9 σ without beam-beam which implies cross-talks between field quality and beam-beam effects. A review of the IT FQ estimates is foreseen also adding the information on the head (tools to be developed). In addition the impact of the field quality of the orbit correctors will be studied with new tools yet to be developed.

Gianluigi asked Ezio to check all the table values and provide feedback to WP2 in case of discrepancies.

Review of field quality estimates and error table convention (E. Todesco)

Ezio presented the latest error table (presented by Susana at the LARP meeting) with new format separating body and end. The table refers to the latest cross-section (to be put under testing form the 3rd prototype). The relative multipoles of the head and body are calculated for the nominal current and normalized with the nominal gradient (calculated from the cross-section at the nominal current). The integral values reported in the table are comparable to what was used before. In this respect one can observe that b6 is reduced from 0.4 to 0.2 in average. b10 is also improved from -0.4 to 0.15 in average. b14 target cannot be met and a corrector could be foreseen. Massimo commented that experience showed that triplet corrector settings can be based only on beam measurements and it might be difficult to define a deterministic method based on optics observables to define the settings of high order corrector. Riccardo asked to add the beam screen part in the systematics. Massimo asked to clarify the ends effects at injection. Ezio clarified that the end effects are mostly geometric (due to the current leads) and therefore are very similar at injection and at high energy. The persistent current effects that would be different from low current to high current are small compared to the geometric. The eddy current effects on field quality are also negligible. Due to the heads, there are additional skew systematics multipole components.

Gianluigi asked to review the magnet convention for the sign of the fields, the V1/V2 for 2-in-1 magnets and summarize them in a note so to avoid misunderstanding. **Action: Ezio.**

The effect of the beam screen on field quality should be added too as a separate table in the column. **Action: Ezio.**

Report from Task Leaders:

Task 2.3: revisit simulations with new error tables, results expected for September.
Task 2.4: new information of for crab cavities HOM will be made available in the WP2 website.
Task 2.5: revisit simulations with new error tables, Sasha will coordinate with Yannis.

Reported by Riccardo and Gianluigi