



## Minutes of the FCC Hadron Collider General Design Meeting

16th October 2014

Participants : M.I. Besana, X. Buffat, H. Burkhardt, A. Chance\*, F. Cerutti, M. Fiascaris, N. Mokhov\*, S. Redaelli, D. Schulte, A. Seryi\*, M. Syphers\*, E. Todesco, R. Tomás, U. Wienands\* (\*Vidyo connection)

F. Cerutti discussed the effect of the [radiation in the final triplet](#). He showed how the energy deposition as well as the integrated dose scales from the LHC, HL-LHC to the FCChh, emphasizing the role of the TAS, the crossing angle and the triplets length and aperture. The integrated dose is a clear limitation, studies for improved shielding as well as an exploration of the design parameters are needed.

- A. Seryi asked about a possible reduction of the factor 3 margin on the peak power density. F. Cerutti answered that the margin are in principle not fixed, but recalled that the main limiting factor is on the integrated dose, not on the power density. E. Todesco mentioned that the factor 3 is a safe choice and that the LHC experience at 7 TeV will provide more information on the quench margins.
- D. Schulte mentioned that there will be an exploration of the parameter for higher luminosity, therefore the radiation studies should also consider this possibility.
- H. Burkhardt mentioned that shorter  $L^*$  could help reducing the radiation on the triplet. In case this is a main limitation for the integrated luminosity, one could think of compromising with the experiments which are the main drivers for large  $L^*$ .
- N. Mokhov mentioned that the energy deposition in the detector for the FCC with respect of the HL-LHC is only a factor 2 higher. However, in the triplet, it scales with a factor 10. F. Cerutti commented that this indeed corresponds to the energy factor plus a contribution from the higher cross section at higher energy.
- D. Schulte said that this should be followed up in the BDS meeting. And that it would be very useful if Nicolai Mokhov could present his studies and participate to the BDS working group.

X. Buffat presented [some thoughts on the filling patterns](#). He showed that the 80% filling factor is difficult to achieve due to the constrain on by-step injection from the LHC to the FCC. He showed that, due to the shift of the two side experiments with respect to those located at opposite azimuth a loss of 30% of luminosity can be expected for these two experiments. It is therefore recommended to place the high luminosity experiments at opposite azimuth, as in the LHC. The luminosity degradation for the two side experiments could be mitigated by adjusting the distance between the experiments, imposing thigh constrains on the filling scheme.

- R. Tomás commented that 30% luminosity loss for the side experiments is perfectly acceptable, recalling that in the LHC the ALICE and LHCb experiments require luminosity at least a factor 3 lower than the main experiments. X. Buffat mentioned that their limit is on the luminosity per bunch crossing, not on the absolute value of luminosity. R. Tomás emphasised that constraining the filling scheme at this stage of the study would not be reasonable.

D. Schulte presented a proposal of P. Lebrun for [new naming conventions for the FCC layout](#), that should be looked at and refined if necessary.

D. Schulte closed the meeting at 5:30, the next meeting will be held on the 6th of November 2014.