



# Minutes of the FCC Hadron Collider General Design Meeting

18th September 2014

Participants : R. Alemany, M. Benedikt, X. Buffat, A. Chance\*, B. Dalena, B. Holzer, J. Jowett, E. Métral, M. Roman, M. Schaumann, D. Schulte, A. Seryi\*, M. Syphers\*, R. Tomás  
(\*Vidyo connection)

M. Benedikt presented some [News from the collaboration board preparatory meeting](#).

- J. Jowett asked whether the studies of M. Schaumann on the heavy-ion performance of the FCC were considered as part of the activities in Collaboration Board meetings. M. Benedikt answered that these meetings will not be focused on technicalities. J. Jowett mention that her work will be presented at the workshop on [Ions at the FCC](#) on the 22nd of September and that a report will be published soon. D. Schulte said that the main workshop for the technical details will be the Annual workshop and meeting of the Future Circular Collider (FCC) study in March 2015.

B. Holzer presented the [Preliminary lattice design and repository](#).

- M. Benedikt asked about the ratio of the filling factors in the arcs and in the DS. B. Holzer answered that the current design is a "textbook" half-bend DS, he added that this is cheap as the quadrupoles can be powered in series, but it is not flexible. R. Tomás mentioned that a LHC-type DS is more flexible and not necessarily more expensive (See R. Martin talk).
- R. Alemany asked whether one is constrained to a design with two rings in the horizontal plane, or should one consider two rings on top of each other. D. Schulte answered that we should only consider the LHC like 2-in-1 design. B. Holzer mention that, for the racetrack option, one then needs an odd number of IP per side, which breaks the symmetry and might reduce the filling factor.
- M. Benedikt asked whether quadrupole magnet with a diameter of 40mm with such gradients are doable. B. Holzer answered that this is the result of a discussion with E. Todesco, but E. Métral is worried that this is a the edge regarding the stability of coupled bunch modes due to the large resistive wall impedance of the beam screens.

R. Martin presented some aspects of the [Integration of experimental insertion](#).

- R. Martin asked what would be the preferred DS. B. Holzer answered that it has to be optimized (length/flexibility) to the specificities of each straight sections, he added that some straight section may not need DS, e.g. BI, collimation, injection/extraction.
- M. Benedikt mentioned that it is better to have margins in term of space at this stage of the design. B. Holzer commented that the current design is very modular and can be adapted according to the evolution of the design.
- R. Tomás mentioned that they will need to do tracking soon and will use the design that they find most reasonable.

A. Chance presented [Plans for lattice design and integration work](#).

- B. Holzer commented that the mirrored option should indeed be considered and that beam-beam considerations should be included.
- B. Holzer commented that higher injection energy would significantly increase of the cycle length of the HEB, due to the limitations in current variation rate of the superconducting magnets at high fields.
- B. Holzer asked about the length of the drift space required by the experiments. D. Schulte answered that for the moment one should stick to the 46m. One could think of later discuss with the detector people about a possible trade off.
- R. Tomás asked about precisions on the "mirror symmetry". A. Chance said that having a full mirrored lattice could cancel higher order terms and therefore improve the dynamic aperture.
- R. Tomás asked about the reason behind the difference between the filling factors for the racetrack and the round layout. A. Chance said that the racetrack leads to a better filling factor because it requires less DS. R. Tomás answered that one should take into account that a small arc is required between two adjacent experimental straight sections, which will require DS as well.

## Actions

1. D. Schulte suggested that he will produce a sketch of the interaction regions design, assuming reasonable length for the straight sections by next week. The design will then undergo several iterations until the Annual workshop and meeting of the Future Circular Collider (FCC) study in March 2015

D. Schulte closed the meeting at 5:45, the next meeting will be held the 2nd of September.