

SESSION 6: 2010 OPERATION

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QUESTIONS / COMMENTS RAISED DURING SESSION 6

Requirements from the experiments - Massimiliano Ferro-Luzzi

Requirements on spectrometer field and polarity:

- Alice: reverse the polarity about once/month; keep the nominal polarity all time. Reversal of polarity is not a problem.
- LHCb: leave the spectrometer at nominal field from injection to top energy. To be noted: This is not possible for one of the two polarities, for which the spectrometer will have to be ramped.

It was noted that in order to push the luminosity, it will be necessary to go to 50 ns bunch scheme.

The relevance of using 156 x 156 bunches was questioned and the idea of abandoning this option and moving directly to a 50 ns bunch spacing was proposed. It was remarked that when moving to truncated 50 ns bunch train, the injection and beam dump checks will have to be performed.

2010 beam parameters, machine performance to be reached in 2010 - Massimo Giovannozzi

Noted on beam dynamics consideration: the minimum β^* without crossing scheme switched on is 2 m, while with crossing scheme it is 2.5 m. The crossing angles are mandatory to widen the performance reach. The trains (50ns) are the solution (new bunches do not add to beam dynamics issues).

The flexibility of the collision filling scheme is important. It enables changing the luminosity in IR2 without varying the optics (un-squeeze) or the crossing scheme (colliding partially separated bunches).

It was stressed that the validation of the systems for each of the new filling scheme used will have to be performed.

Longitudinal parameters: different options to blow up the beam in the longitudinal plane are available.

IBS: It is not worrying with the special parameters for the initial run. The fast natural growth in the longitudinal emittance will help in stabilizing the transversal plane.

Short overview of optics:

In IR1 and IR5: first step in the squeeze, at constant β^* , is to change the tune from injection to collision tunes. Beta beat is zero at the end of each squeezing steps. Variation of the tune over the squeeze is about $1.5e-3$.

In 2 and 5: Optics is constant from injection to about 6 TeV. Then pre-squeeze is performed with triplet strength decreasing at constant β^* . Squeeze is done at top energy. This year, pre-squeeze and squeeze will be done at the same time.

Could the ALICE spectrometer and its compensators be the source of the HUMP? Being investigated.

Injection: Separation bumps are closed from Q5 left/right in both IR2 and IP8. TDI setting up will have to be redone in 2010.

2010 commissioning plans – Mike Lamont

Highlighted points:

- Physics runs and MDs will be decoupled. 3 days of technical stops are planned about every month, the injector complex will be in MD during that time.
- Commissioning steps were given, taking into account that all what has been done last year will have to be re-checked.
- Collisions at 3.5 TeV, first unsqueezed and then commission squeeze.
- Should decide for which kind of beams we would like to commission the collimators.
- To make a detailed schedule of the LHC beam commissioning, shift by shift, to be presented for approval at the LHC BC WG.
- Estimate of 4 weeks to get to stable, safe, squeezed beams at 3.5 TeV.
- The first collisions at 3.5 TeV will be a major media event. And it should indeed be the first collisions, meaning that establishing the conditions for stable beams will have to be done with non colliding bunches.

Increasing the intensity:

The list of pre-requisites was given and must be fulfilled - remember the damages done in 2004 in TT40. The proposed steps in increasing the intensity, from moving from one unsafe beam step to the next one was discussed. It was emphasized that each time we move from one step to the next one, some checks will have to be repeated. How long will it take? With experience it will take less and less time, but at the beginning it can take as much as 4 weeks. It was confirmed that these steps will take time and we should get the time as we increase the intensity.

Wrap-up, list of subjects to follow-up, critical points – Paul Collier

Highlighted points:

- Reminder: there will be a Lead ion run later in the year.
- LHC beam quality to be further investigated.
- More rigorous in following the cunning plan!
- Must spend the time needed at the beginning of the commissioning in order to save time later.
- Make a list of follow-up items to be monitored, e.g. spare parts for klystrons, SPS scrapers.

Concluding remarks – Steve Myers

The organising committee, the chairpersons, scientific secretaries and speakers were warmly thanked for their essential contributions which made this workshop extremely interesting, fruitful and essential to prepare for the 2010 beam operation.