MPP meeting 22 January 2010

Agenda:

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- Results of the IR aperture scans (J. Wenninger)
- Beam position and orbit corrector interlocks (J. Wenninger)
- AOB
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Present:

Tobias Baer, Steffen Mueller (CMS), Richard Jacobsson (LHCb), Alick Macpherson, Mario Deile (Totem), Stephano Redaelli, Giulia Papotti, Laurette Ponce, Bernd Dehning, Siegfried Wenig (ATLAS), Witold Kozanecki (ATLAS), Daniella Macina, Ruediger Schmidt, Christoph Kurfuerst, Antonio Di Mauro (Alice), Jorg Wenninger, Mike Koratzinos,

Minutes:

AOB (Jorg):

Jorg informed us that the relevant Evian talks are already available in the MPP pages (together with Jorg's talk in Chamonix). He proposes to have a review of what was discussed in Chamonix in a future MPP meeting.

 SPS scraper repaired and the copper jaws were exchanged with carbon jaws. The Cu jaws were not damaged.

A short document will be prepared with what is allowed and what is not regarding LHCb's VELO detector.

Beam position and orbit corrector interlocks (Jorg)

Jorg presented the first implementation of interlocking the orbit correctors and the orbit itself using the Software interlock system (SIS). The orbit interlock settings control has elements which have a setting value and a tolerance. Only Jorg and the EICs can change the interlock parameters. There is one group of settings for injection ramp and squeeze, and one for stable beams. The system is completely independent from the interlocks for injection for the experiments. The interlock references and tolerances can be displayed in the steering application together with the actual settings in the machine. The margin that the operator has for steering is clearly indicated. The tolerances are presently set to the equivalent of 2 sigma. The interlock triggers if two correctors are out of tolerance. The history of

interlock conditions is recorded. The corrector interlocks were activated for stable beams but the monitor interlocks were masked until more experience is gained.

The logic of all interlocks of the SIS will be described in an EDMS document (in preparation).

Stefano asked if it is possible to put limits on trimming. Jorg: for the time being it is better to simply give a warning to the operator.

Results of the IR aperture scans (J. Wenninger)

Jorg also presented an analysis of the interaction region aperture scans of December. Aperture scans were performed on all IRs with pilot beams with asymmetric bumps (optimum for strength requirements on the correctors). As a rule of thumb, an angle of 20 microrad at the IR gives a 1 mm peak bump amplitude. To find the aperture the bump was increased in steps starting from 1mm. 40% of the 'hump' (the point of highest excursion) is not seen by the BPMs as they are positioned before and after the 'hump'.

During the IR1 scan a beam dump was triggered. This is the reason that the test was repeated. It seems that ATLAS has set the thresholds a factor of 100 below that of the other experiments. In the second test the thresholds were increased by a factor 10. There was some discussion on this point regarding which threshold is the appropriate one. Rudiger said that it would be nice to harmonize thresholds, Jorg said that for the time being and while there are not problems we keep thresholds as they are.

In the slides with the results shown the blue is the baseline orbit, the reconstructed theoretical bump is plotted in red and the purple band is 4 sigma around it. The BPMs close to the IP systematically underestimate the orbit. It is worth looking closely to this. Is it an indication of problems with the couplers or their calibration?

There is very good agreement at IR1, IR2, IR5. IR8 has some signs of disagreement, but some BPMs were off.

Ruediger asked if these plots can be made available on-line. Stefano is working on that.