

## 101<sup>st</sup> Meeting of the LHC Collimation Working Group, March 23<sup>rd</sup>, 2009

*Present:* Oliver Aberle, Arnau Izquierdo Gonzalo, Ralph Assmann (chairman), Giulia Bellodi, Alessandro Bertarelli, Romain Blanchon, Chiara Bracco, Francesco Cerutti, Alessandro Dallochio, Barbara Eva Holzer, John Jowett, Stefano Redaelli (scientific secretary), Adriana Rossi, George Smirnov, Heinz Vincke.

### Comments to the minutes

No comments to the previous minutes.

### Agenda of this meeting

- Review of FLUKA simulations for Phase II (F. Cerutti)
- Status of Phase II hardware at SLAC (T. Markiewicz)

**The next meeting will be March 30th, 2009.**

Provisional agenda ( <http://lhc-collimation.web.cern.ch/lhc-collimation/>):  
Dry-run of review presentations.

- G. Bellodi: Improved Ion Collimation Efficiency
- E. Metral: Collimation-Driven Impedance
- D. Macina: Requirements from Experiments

## Minutes of the meeting

### 1 Review of Phase II FLUKA simulations (F. Cerutti)

F. Cerutti presented the results of the FLUKA simulations of energy deposition with cryo-collimators in IR7. In particular, Francesco showed the results of study cases agreed at the collimation meeting of March 23rd: effect of opening of the cryo-collimator, of length and of material (Cu vs. W). Simulations for ions (inputs provided by G. Bellodi) are ongoing and hopefully they will be available for the review.

R. Assmann welcomed the excellent results that show that we can achieve the factor 10-15 improvement that was the overall goal for Phase II studies. This message should be stressed at the review. Ralph also recommended to mention that the results are achieved for nominal parameters (no imperfections in FLUKA). He also suggested to display on the various plots the quench limits for the different magnet types, which effectively is a factor 3 lower than the “real” quench limit due to the threshold settings of the BLM system.

A. Dalocchio asked if one can reduce the length further. F. Cerutti replied that 0.5 m seem to be a minimum length to be affective, if Tungsten is used. A facotr 2 in length in needed to achieve the same performance if Cu is used.

A. Bertarelli asked if there are practical differences between W and Cu, for example any problem in the heating of materials. F. Cerutti replied that he did not yet look in details these aspects but he does not expect significant differences. The distribution of deposited energy are available for all cases. Heinz Vincke stressed that there could be RP implications because the doses in Tungsten are higher and stated that S. Roesler running simulations to address this problem. Results will be available for the review. R. Assmann commented that, unless there will be compelling RP arguments, we should assume as a baseline 1 m of Tungsten. We should not forget that with this layout the magnets will be less irradiated and this would ease interventions in the zone.

A. Dalocchio suggested to mention that the presence of cryo-collimators could help the impedance by allowing operation at larger TCSG gaps. R. Assmann replied that this will be discussed in the talk by T. Weiler and also by E. Métral.

### 2 FLUKA studies with cryo-collimators (T. Markiewicz)

T. Markiewicz presented for comments a first draft of his presentation on the status of the Phase II hardware at SLAC.

R. Assmann suggested to give more details on the effect of the jaw deformation and suggested to make explicitly the point that jaws are designed to bend outside of the beam core, so that they do not become primary collimators in case of heating. The transient reduction of cleaning is considered limited. Same criteria as of Phase I. A. Bertarelli suggested to review the details of the simulations because the extremities of the jaw could actually move into the beam.

R. Assmann also suggested to stress more explicitly the benefits of this “consumable” design, which allows using metals in the accelerator while coping with the most severe failure scenarios (20 beam hits are possible on paper). T. Markiewicz expected this aspect to be covered in the introductory but will add some details if this is not the case.

R. Assmann also suggested to mention that we do have metallic collimators already, which would have to be replaced in case of damage. The SLAC collimator could be plugged in other locations as well.

**The next meeting will be March 30th, 2009.**