Minutes of 106th Collimation Upgrade Specification Meeting

Participants: A. Abramov (AA), C. Adorisio (CAd), C. Bahamonde (CB), R. Bruce (RB), M. d’Andrea (MA), L. S. Esposito (LE), N. Fuster (NF), H. Garcia Morales (HG) (scientific secretary), I. Lamas (IL), A. Lechner (AL), A. Mereghetti (AM), D. Mirarchi (DM), J. Molson (JM), L. Nevay (LN), R. Rossi (RR),

Indico event [here].

1 Actions

Actions from this meeting:

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2 Crystal energy deposition (Cristina Bahamonde)

[slides]

2.1 Summary of the presentation

- CB presents the results of the simulations of the crystal channeling of ions on different TCSG materials. The idea is to study the energy deposition levels on different secondary collimator materials due to the channelling of ions coming from the horizontal crystal on TCSG.B4L7.B1.

- CB shows the input distribution used in FLUKA simulations. This distribution was provided by RR. These simulations are benchmarked against previous simulations. Then, she shows the peak power density along the impacted jaw of the TCSG.B4L7.B1 and TCSG.6L7.B1 for 12 minutes beam lifetime. Then, she describes the power load to the different parts of the collimator.

- RB comments that the power measured during the quench test was 90kW.

- CB shows the characteristics of the different materials studied (CFC, MoGr and Inermet) and the peak power density along the impacted jaw. Finally, CB shows the comparison of the power load to the different parts of the collimator for different materials.

- CB concludes that the FLUKA maps must be provided to the MME team for detailed structural analysis.

- AL total power is higher but peak power is not that higher (slide 11).

- RB most of the deposition is in the jaw, numbers are per jaw.
2.2 Discussion

- AL comments that the next step is to analyze the data from the crystal MD. RB points out the necessity to understand if the observations are something fundamental or just a product of beam showers.

3 Crystal MD results R&D (Marco D’Andrea) [slides]

3.1 Summary of the presentation

- MdA presents the results of the last MD on crystal collimation with protons.

- MdA explains that due to limited machine availability, only a small fraction of the MD program was carried out. Then, he shows the measurements done at injection for B1. Channeling was observed as expected in both transverse planes and reduction factors are consistent with measurements performed in previous years. For B2 in the horizontal plane, the reduction factor for the angular scan was smaller than expected. This might be due to a non-optimal alignment of the crystal.

- MdA shows the results at top energy for B2 in the horizontal plane. The reduction factor is as expected although a bit narrower than expected. This needs to be understood via simulations and new measurements.

- In conclusion, MdA explains that the channeling was successfully observed for the new B2H crystal, which seems to be within specifics, and for both B1 crystals.

3.2 Discussion

- RB points out that it is important to understand why the observed channelling angle was 40 urad instead of specified 50 urad. DM comments that this might be due to the fact that at injection the crystal was too much in.