Minutes of the 19th BLM Threshold Working Group Meeting August 25, 2015

Present: B. Auchmann, V. Chetvertkova, S. Damjanovic, P. Hermes, E. B. Holzer, J. Jowett, M. Kalliokoski, A. Lechner, A. Mereghetti, T. Mertens, M. Schaumann, D. Wollmann and C. Xu.

BLM Settings for Ion Runs (J. Jowett)

Presentation

In comparison to the last Pb-Pb run in 2011, due to higher energy and luminosity, higher luminosity- and collimation losses are expected. The magnets are expected to quench more easily but the quench level is uncertain. Some hints could be drawn from a quench test.

For ion collisions, the beam losses occur in the Dispersion Suppressor (DS) through the mechanism of Bound Free Pair Production (BFPP). This is clearly visible in the BLM data from 2011 and well reproduced by particle-tracking and particle-shower simulations. Using an orbit bump, the losses could moved to a less vulnerable location, i.e., the empty cryostat in cell 11. The orbit bump slightly increases the BFPP impact further downstream but also increases the impact angle and spot size.

Orbit bumps are less effective for ALICE and thus levelled luminosity is required. The December run will be the only Pb-Pb run before 2018, and thus the BLM thresholds should be set as high as possible, among others to allow the BFPP quench test MD. These results will be further used for the decision of installation DS collimators during LS2.

Discussion

Michaela asked if the BLM thresholds could be set at quench level. *Bernhard* replied that they are generally at quench level whenever we know the loss scenario very well, which will be the case for BFPP.
John noted that we may produce losses just below the quench level. In any case the losses could give a lower bound.
Daniel pointed out that there is no full freedom to remove all thresholds, but they can be raised to, or just above the assumed quench limit (and even higher in a quench test MD).
Tom asked at what level the thresholds are set. *Bernhard* replied that they can be set up to a factor 3 above the assumed quench level.
John noted that for BFPP the losses are much cleaner.

Anton pointed out that in the loss locations there are only few separate BLM thresholds families to be adjusted.
John said that in the collimation region no adjustment to the thresholds need be made, as the showers registered by the BLMs should be comparable to a proton run, as several effects in the switch to ions balance each other.
Daniel reminded that for collimation thresholds we should stay at 200 kW primary losses (MF 0.4) to avoid surface damage.

FLUKA Simulation of BLM Signals in the DS Right of P5 (A. Lechner)

Presentation

Anton presented FLUKA simulation results of BLM signals from BFPP in the location close to the connection cryostat. From the analysis the most sensitive BLM can be found. In addition in 11R5 there are more BLMs than in the other locations. This assists in confirming the shift of losses from BFPP after the instauration of an orbit bump. The simulations also show

TS 2 ECR (IR 7 Collimation, Wire Scanner Families, XRP Monitor Names) (M. Kalliokoski)

Presentation

The plan is to implement the changes on Monday 31st. The changes will affect monitors in IRs 3, 4, 5, 6 and 7. All the changes are described in LHC-BLM-ECR-0038.

In IRs 6 and 7 the new thresholds for RS9-12 at 6.5 TeV will be in general higher or as high as during Run1. For IR3 the thresholds can be lower than the Run 1. Since the collimation losses are smaller in IR3 than in IR7, this is not expected to limit the operation. However the situation needs to be monitored.

Next Meeting

Tuesday 9 September, 14:00.

Minutes by M. Kalliokoski (BE-BI)