

MPP meeting 1 October 2010

Original agenda:

- Simulations of ion beam loss (R. Bruce)
- Proposal for Setup Beam Limits for ions (J. Wenninger)
- (Re-)commissioning of MPS components for ions (round-table)
- AOB

Present:

Walter Venturini, Nicola Bacchetta (CMS), Bernd Dehning, John Jowett, Roderik Bruce, Siegfried Wenig (Atlas), Chris Zamantzas, , Richard Jacobsson (LHCb), Giulia Bellodi, Matteo Solfaroli, Bruno Puccio, Ben Todd, Sigrid Wagner, Stephane Gabourin, Richard Hall-Wilton, Stella Orfanelli, Laurette Ponce, Werner Riegler, Ralph Assmann, Jorg Wenninger, Mike Koratzinos.

Minutes:

News (Jorg)

BLM threshold increase imminent: proposal is for factor of 3 for all integration times. As the previous thresholds were a factor of three lower than the calculated quench limits, the new thresholds are at the calculated quench limits.

Simulations of ion beam loss (Roderik)

Roderik outlined the simulation of ion beam losses. Difference with protons: a lead ion loses a factor of 80 more ionization than a proton (total energy deposited is of course the same and equals the initial energy). The Fluka simulation of ions on a copper target show a sharp peak at the entry point for Pb but for protons a smooth curve that has a maximum some centimetres inside the material. The peak a factor of 4 higher. The Pb simulations show also this second peak which is similar to the proton case.

For losses in a dipole, the difference between Pb and protons is in the beam screen that now sees more energy deposited.

The simulation of an erroneous trigger of a dump kicker gives a factor of 6 (not 4 as expected) higher peak energy deposition per charge for Pb compared to protons, but simulation is old. Systematic study using the latest simulation parameters is needed.

Safe beam limit for ions (Jorg)

Jorg presented a proposal for the safe beam flag (SBF) limit for ions: naive approach would be to divide the safe beam limit of protons by 4 (present BSF limit at 3.5TeV is $3.1E10$ proton charges). But there is a practical point: DC BCT noise is $3-4E9$ charges. Therefore, the minimum practical BSF limit is $1.2e10$. So we can only do a factor 2 to 2.5.

Jorge put forward two options: option 1: leave SBF as it is for protons. This means we can have about 4 bunches before reaching the limit. Advantage is that there is no change to SMP; option 2: lower SBF by a factor 2. But re-qualification of SMP is required, although the change required is only in the safe beam table, where all values are divided by 2. The meeting leaned towards Option 2 after some discussion and it was stressed that this factor of 2 is mainly due to practical considerations (we cannot go to higher factors due to noise). Discipline from EICs will be required.

Collimator system: secondary collimators would need to be retracted by 2 or 3 sigma.

AOB (J. Jowett)

John raised another point: there is an Alice request for an early heavy ion test around 19 October: 20 hours of beam time with ions and getting some collisions. (No squeeze and only one bunch). Justification is to see if there are any showstoppers, as the ion setup time has been reduced from 2 weeks to 4 days. Collimator setup should be further discussed. MPP agrees in principle with the test (but will be difficult to do it in the 20h requested).