PSB Energy Upgrade Working Group

Expected Beam Losses and Cures at Injection

S. Aumon, L. Fievet, S. Gilardoni, G. Rumolo - 24 of June 2010
Thanks to the Operation group
Motivations: Irradiation Rue Goward
Losses at PS Injection – High intensity beams

According to the Radiation Protection, 3% of losses on the Rue Goward during injection process.

1. Losses due to the incoming beam, deduced from a profile measurement with the SEM42 in the septum.

2. Slow losses observed in 2009 on ToF beam during the 150-200 turns after injection.

Cures:

1. Find another injection configuration which minimize the losses from the incoming beam (MD very soon): small beam size @ injection, feasibility to use QKE16 to help the kicker 45 by increasing the betax in SS45

2. Not yet understood. Does not seems to come from the fact the bump is too high.

→ Space charge, tune shift? Several studies have carried out in the past (E. Metral, R. Cappi,
Conclusion - Outlooks

In any case, we have to consider an extra shielding on the Route Goward independently of the upgrade.

The shielding will be the same with an upgrade only for LHC beams.

For an energy upgrade for all beams, the shielding should be “consistent” (constant % of losses for more intense beams at higher energy).

What do we gain in space charge @ injection, in beam size and losses.