LHC MD90

Special collimator settings for reduced impedance requested by rkwee

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Merit: Collimators are the dominant transverse impedance source, while tighter collimator settings are necessary for reaching small beta*. This MD verifies if retraction of individual secondary collimators helps reducing the impedance, while still maintaining adequate cleaning and machine protection. This could help in pushing the hierarchy, and thus beta*, without a too high impedance increase. Measurements on BLM data sensitivity to collimator setting changes will also be performed parasitically to benchmark analysis tools that identify settings errors from anomalous loss maps.

MD contact person: R. Kwee, A. Rossi

MD procedure link: ()

Category: Normal MD

Beam: Both

Participants: collimation team & impedance team

OP contact person: B. Salvachua

Description: Measure impedance, verify cleaning efficiency and machine protection for difference variation sets of IR7 collimator settings. Measurements can be done at flat top starting from the end-of-ramp settings in IR7. The tests foresee: (1) Retracting a selected subset of secondary collimators at 12 sigma while maintaining asynchronous beam dump protection; (2) Retracting a selected subset of single jaws, with the opposite jaws at nominal positions. For each type of setting, the cleaning will be checked through loss maps. The TCT/triplet protection during asynchronous beam dump will be checked for the most promising setting scenarios. Impedance is inferred through tune shift measurements. Note that asynchronous beam dumps could optionally be performed for other setting scenarios as EoF of other MDs to check sensitivity to collimator settings.

Time required (Hours): 4

Beam energies:

- Flat top

Optics: beta star 80 cm

Optics change: No

Orbit change: No

Collimation change: Yes

RF system change: No

Feedback change: No

What else should be changed: changing only IR7 secondary collimator settings

Are parallel studies possible?: No

More information on parallel studies? Potentially, can work on one beam.

MD requester is ready? Yes

Beam parameters

Bunch intensity (10^{11} ppb): 1.2 and 0.5

Number of bunches: 1 nominal and several pilots

Transverse emittance (um): 3.5 or smaller

Bunch length: 1

MD status

Time slot assigned?: No

Assigned duration:

Status: Requested
Coordinator MD readiness:
MP classification: A
MP approval: No
rMPP approval: Yes
Need 2 extra hours for ramp down: No