

LHC MD74

Active halo control requested by rbruce

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Merit: This MD investigates possible mitigations for spurious beam dumps due to overpopulated beam tails being scraped instantaneously on the collimators in case of orbit jitter. The investigated techniques aim at providing an active halo control to deplete the tails in a safe and controlled manner. The results could, depending on the operational bottlenecks encountered, be beneficial both for Run II and HL-LHC (including machine protection aspects during fast crab-cavity failures).

MD contact person: Roderik Bruce

MD procedure link: ()

Category: Normal MD

Beam: Beam 1

Participants: Collimation team, O. Bruning, R. De Maria, B. Dehning, M. Fitterer, M. Giovannozzi, W. Hofle, T. Pieloni, H. Thiesen, D. Valuch, Collaborators: G. Stancari (FNAL), G. Franchetti (GSI)

OP contact person: Belen Salvachua

Description: This MD aims at testing two techniques of halo depletion that uses the present hardware: tune modulation (using warm quadrupoles) and ADT narrow-band excitation. Reference: https://espace.cern.ch/lhc-machine-committee/Presentations/1/lmc_197/HL_LHC_halo_RBruce.pptx . these could be alternative (cheaper) methods to the electron lens, which is being studied for HL-LHC. The success of the MD relies heavily on the possibility to measure the halo population. Therefore, the first part of the MD is dedicated to exploring techniques for that.

Time required (Hours): 24

Beam energies:

- Injection

Optics: standard injection

Optics change: No

Orbit change: No

Collimation change: Yes

RF system change: No

Feedback change: No

What else should be changed: Need to introduce periodic time variation of the current of warm trim quadrupoles. Need to use the ADT for narrow-band excitation. Need to change gain of wire scanner. Need to change octupole current.

Are parallel studies possible?: No

More information on parallel studies?

MD requester is ready? No

MD readiness:

Beam parameters

Bunch intensity (10^{11} ppb): 1.1

Number of bunches: 2

Transverse emittance (μm): 3.75

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