

Draft schedule and description of 2006 collimator beam tests

SPS

Time allocated: 2 x 24 h

(a) Low intensity measurements

Bunch population	1.1e11 p
Number of bunches	1 to 16
Beam energy	270 GeV
Emittance	~ 1 μm
H beam size at collimator	~ 0.4 mm
Beam orbit stability	~ 10 μm

(b) High intensity measurements

Bunch population	1.1e11 p
Number of bunches	288
Beam energy	270 GeV
Emittance	~ 3.75 μm
H beam size at collimator	~ 0.7 mm

Time required [h]	Task
8	Set-up of low intensity stored beam (see above)
4	Set-up of high intensity stored beam (see above).
3	Access for installation of latest sensors, motors and for checks and debugging.
6	Control software commissioning: Commission control of collimator + sensors + switches+ BLM's from CCC. Check interlocks. Measure sensor offsets, linearity, mechanical play, ... and input to software database.
6	Collimator calibration: Calibrate jaw positions with respect to beam (a) by touching beam (non-destructive) and (b) by scraping (destructive). Determine accuracy of method and iterate if necessary (2nd phase control software commissioning).
6	Impedance: (a) Repeat the tune shift vs. collimator gap measurement, possibly for different emittances and bunch lengths. (b) Tune shift vs. position of single collimator jaw. (c) Verify the inductive bypass.
6	Halo studies: Re-population versus current, jaw setting, lifetime, Characterize beam loss tails for understanding required waiting time.
3	Controls commissioning high I: Temperature sensors, EM noise signals, cooling, ...
4	Beam loss maps: Beam loss maps at under controlled conditions, for various intensities. Loss maps with closed orbit bump. Loss maps and diffusion with non-linear bump.
2	Vacuum pressure at the LHC prototype collimator.

TT40

Time allocated: 24 h

Beam conditions:

Energy	450 GeV
Bunch intensity	1.10E+11
Number of bunches	288
Emittance	~ 3.75 μm

Collimator conditions:

Same location in TT40 as in 2004 (under vacuum)
Horizontal collimator orientation
One jaw only will be installed
Window in the tank to measure vibrations with a laser vibrometer

Beam required for test:

Number of nominal shots on jaw 6 x 3.3e13
Beam-jaw alignment tolerance 1 mm

Beam required for beam set-up:

Same as in 2004.

Total beam:

Same or less as in 2004.

Time required [h]	Task
8	Set-up of high intensity extraction
8	Access
8	Beam tests