

MD#1828 Beam scraping in case of non-working beam dump

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Procedure: Injection energy

As a normal MD.

- Inject a train of 12b in B1.
- Correct the orbit then turn the OFB off.
- Scrape all bunches by maintaining a 30 minutes lifetime with the ADT white-noise excitation in the horizontal plane.
 - Monitor lifetime in the FBCT and BLM applications and losses in IR7.
 - Increase the ADT gain by steps of 0.01 to reach a beam lifetime of 30 minutes.
 - Lower the gain if losses reach warning levels or if lifetime goes below 30 minutes.
 - Monitor orbit and damping when intensity becomes lower than $5e10$ ppb.
 - Scrape until the beam is dumped and identify the cause of dump and the intensity threshold.
- Repeat with a train of 144b (or the longest available) in B2.

MP aspects: Injection energy

Flags, interlocks and collimators settings:

No interlocks should be masked or flags forced.

AG cleaning must be on in automatic mode.

ADT excitation window should be **increased** to 12 then 144 bunches.

The **OFB should be deactivated** to avoid correcting the non-linear orbit readings due to the lower bunch intensity.

The cryogenics operators should be warned of the increased heat load in IR7.

Possible causes of dumps:

The damping is expected to switch off at $3-4 \times 10^{10}$ ppb.

The orbit reading should become unreliable at $2-3 \times 10^{10}$ ppb.

The **beams should be dumped** by the **BPMS interlock** in IR6 when the intensity is **lower than 2×10^{10} ppb**.

Procedure: Top energy

As an EoF MD during the intensity ramp up, at the end of a top energy Fill with a number of bunches per beam between 200 and 300.

The beam mode should be reverted to Adjust and the beams separated from collisions, the OFB should be deactivated.

- Scrape 48 bunches from B1 with horizontal excitation by maintaining 30 minutes lifetime (with the same precautions as injection), stop when the bunch intensity reaches $3e10$ ppb (**tbc at inj**).
 - Losses should be kept below 10% of threshold.
- Scrape 48 bunches from B1 with vertical excitation.
 - Losses should be kept below 10% of threshold.
- Scrape 96 bunches from B1 with excitation in both planes.
 - Losses should be kept below 20% of threshold.
- Scrape up to 280 bunches from B2 with the excitation method leading to the lowest BLM signal to threshold ratio in the critical monitors.
 - Losses should be kept below 50% of threshold, warning levels will have to be tolerated.
 - Scrape until the beam is dumped and confirm the cause of dump and the intensity threshold.

MP aspects: Top energy

Flags, interlocks and collimator settings:

No interlocks should be masked or flags forced.

AG cleaning must be on in automatic mode.

ADT excitation window should be **increased** to 48 then 280 bunches.

The **OFB should be deactivated** to avoid correcting the non-linear orbit readings due to the lower bunch intensity.

The cryogenics operators should be warned of the increased heat load in IR7.

A **loss power up to 20 kW** is expected in the TCPs in the last test.

50% of the dump threshold on RS12 (82 seconds) should be reached.

Possible causes of dumps:

The damping is expected to switch off at $3-4e10$ ppb.

The orbit reading should become unreliable at $2-3e10$ ppb.

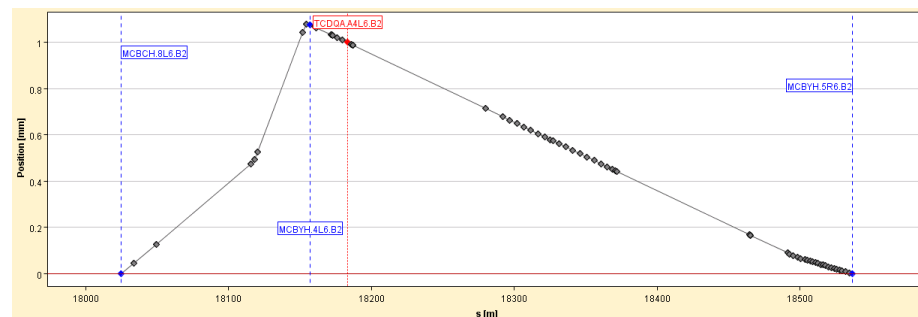
The **beams should be dumped** by the **BPMS interlock** in IR6 when the intensity is **lower than $2e10$ ppb**.

MD#2183 Calibration of B2 dBLM in IR6

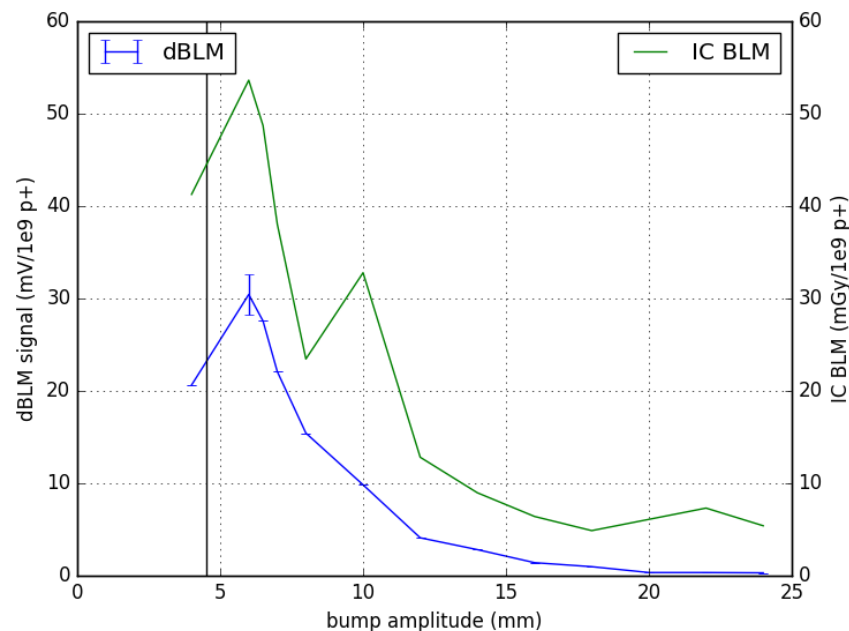
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Procedure: (Same as MD1182 in 2016)

- Set the TCDQ/TCSG at top energy position.
- Inject pilots on the TCDQ with various impact parameters using a growing bump (3 to 13 mm with steps of 0.5 then 1 mm).
- Compare to B1 results from last year.
- Shoot a nominal at the angle yielding the maximum signal/p+ ratio.
- Repeat and verify shot to shot variation below 10%.



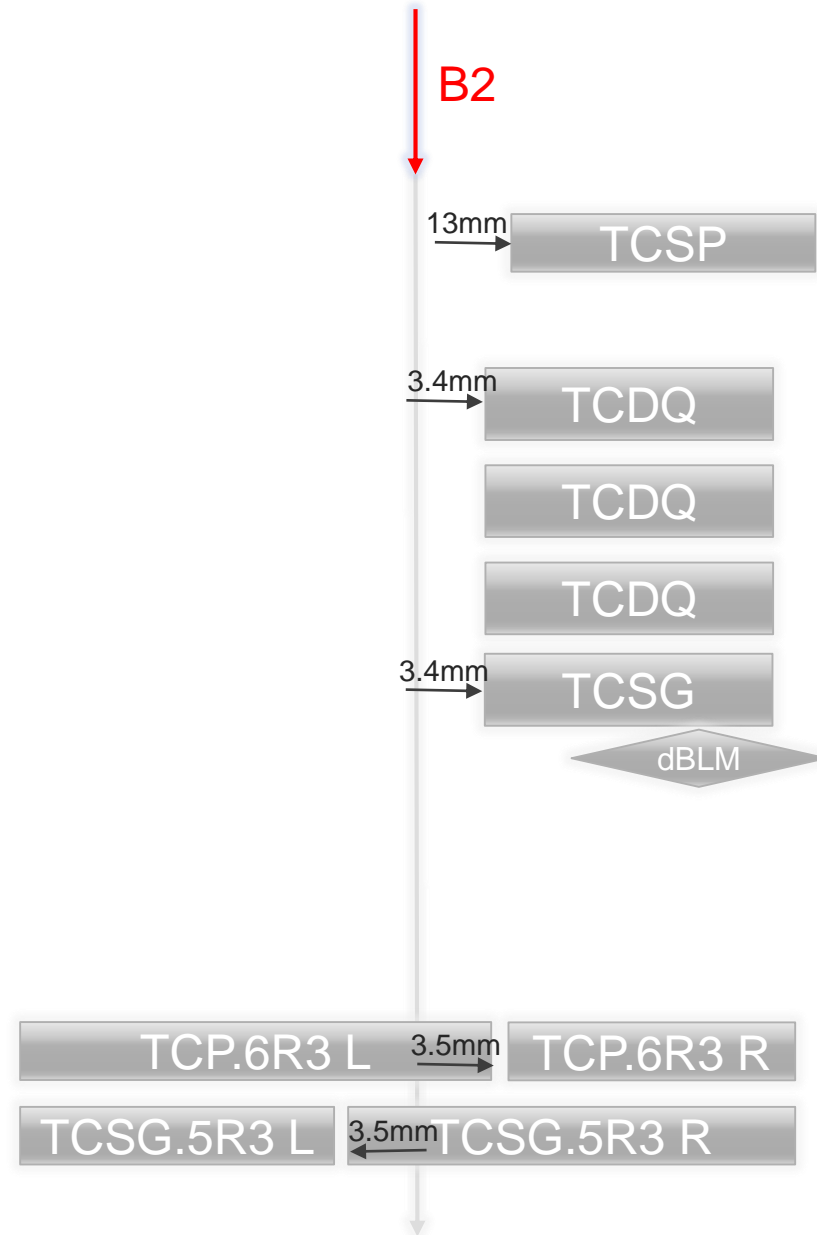
Bump in YASP



B1 results in 2016

MP aspects

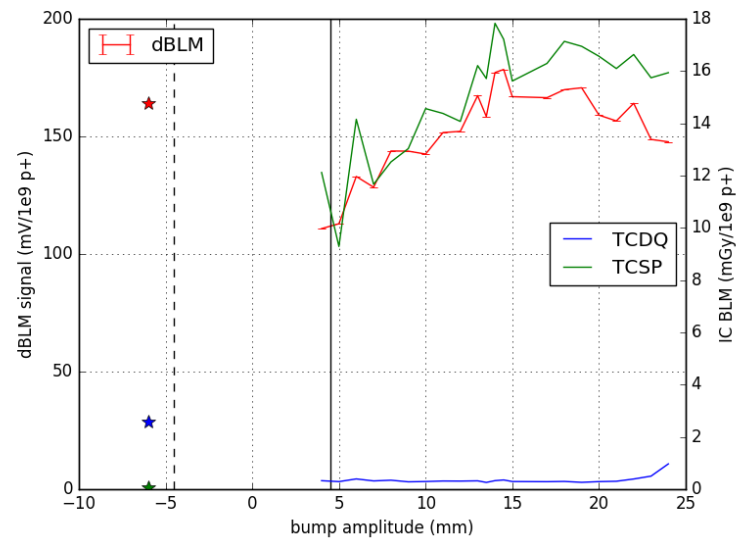
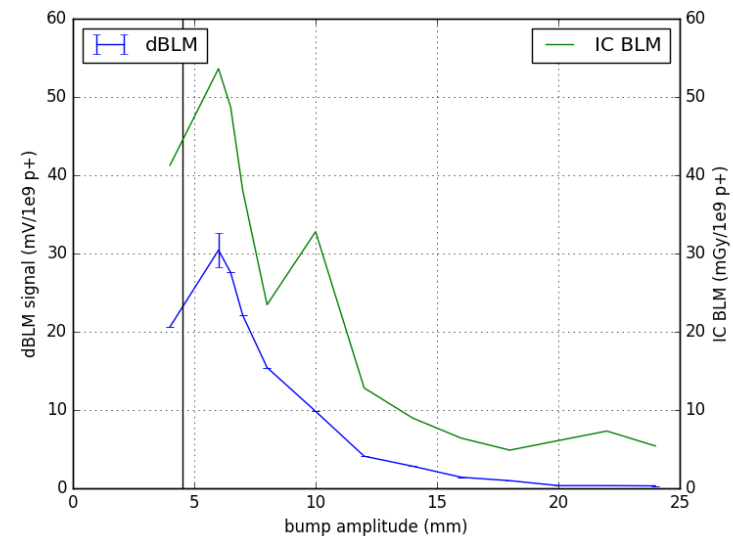
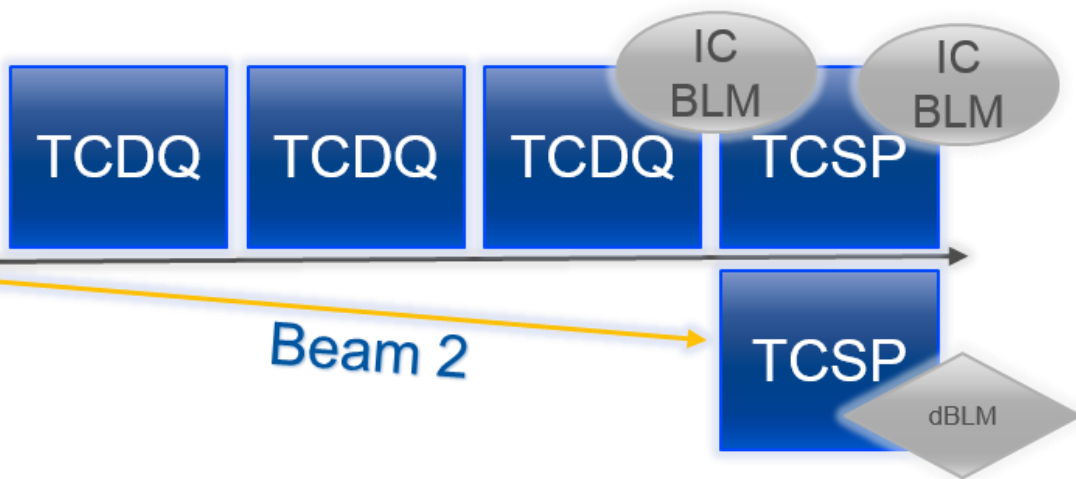
- Change of TCDQ/TCSG position to top energy setting.
- Close IR3 collimators to avoid circulating beam:
 - TCP.6R3.B2 left jaw to $-3500\mu\text{m}$,
 - TCSG.5R3.B2 right jaw to $3500\mu\text{m}$
 - other jaws in parking
- Allow inject & dump 2 turns of a small nominal ($<1\text{e}11$ p+) into an empty LHC.
- Masking of XPOC.
- No magnet quench expected (no magnet was quenched last year, even when shooting directly at the TCSG).





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Spare slides

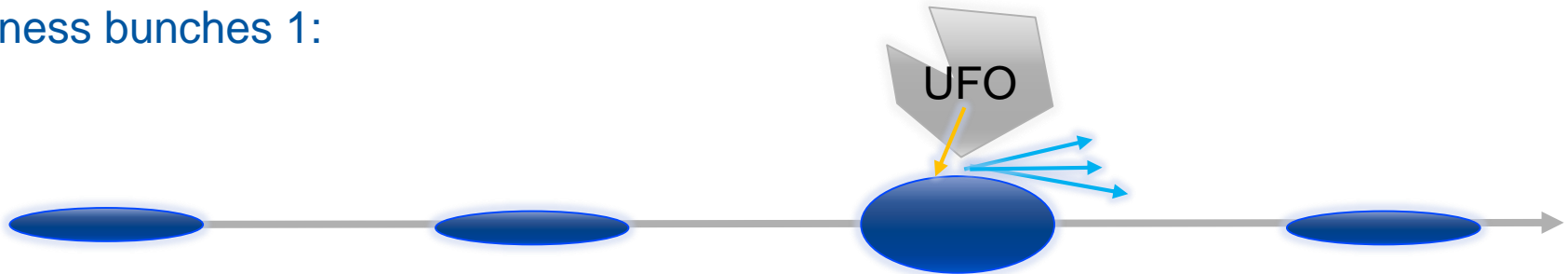


Spare slides

Normal case:



Witness bunches 1:



Witness bunches 2:

