MD1828: Beam Scraping in case of non-working dump – top energy

Motivation: in case a dump cannot be executed with beam in the LHC it is necessary to have a procedure tested and ready to scrape the beam in the collimation system in a controlled way.

One way to do it is to blow up the beam continuously with the ADT. This procedure was tested at injection and should be confirmed **at top energy**.

The maximum power dissipated in the collimation system is limited to 200 kW which corresponds to a 30 minutes lifetime with a full LHC at top energy.
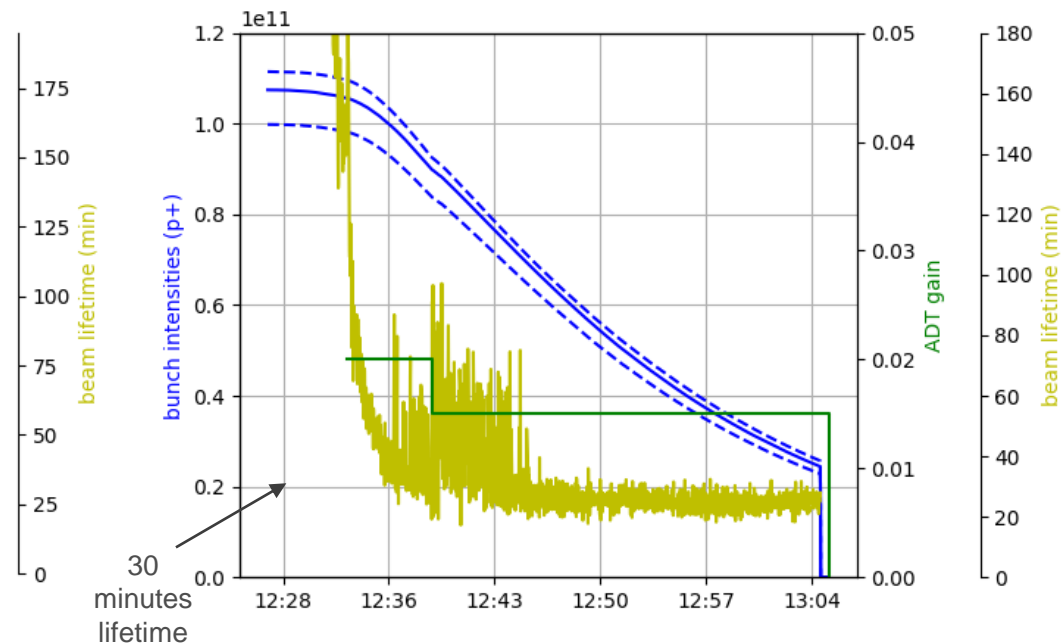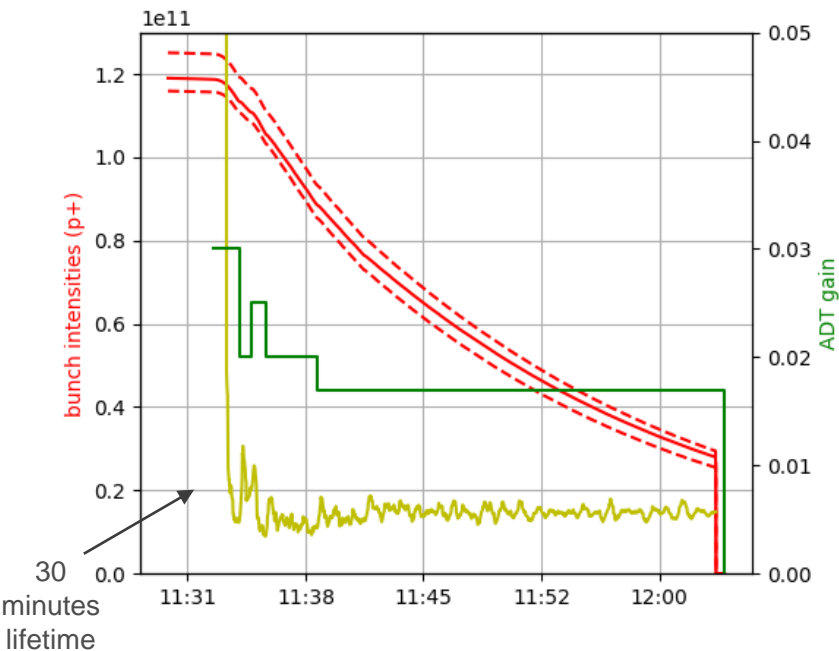
Goal: demonstrate the feasibility of maintaining a stable 30 minutes lifetime of the LHC beam with the ADT **– at top energy**.
Without changes of the machine protection system or interlocks !

Test at injection

Successfully demonstrated it was straightforward to scrape 12, then 144, bunches in the LHC collimation system.

Only one change of ADT gain in the second test.

Top energy validation as an EoF MD

After the RF MD:
(600 bunches with 25 ns beam)

B1:

- Scrape 12b with 30 minutes lifetime
- Scrape 48b with 30 minutes lifetime
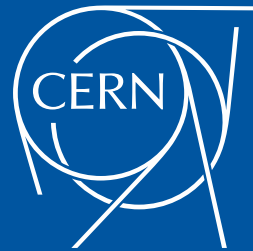- Scrape 400b with 30 minutes lifetime

Stop at 5e10 ppb to avoid dumping

B2:

- Scrape 600b with 30 minutes lifetime

Wait until dumped by non-physical orbit readings

Bunches	Lifetime (min)	Losses (kW)
12	30	0.8
48	30	3.2
400	30	26
600	30	40
RS12 dump threshold (80 seconds)		80

Losses should be lower if the bunch intensity is lower than 1.15e10 ppb at the end of the RF MD

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