- LHC MD284 -

Beam tail population measurements using collimator scans

rMPP meeting

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on behalf of the collimation team

Halo measurements

- **MD merit:** Measurement of tail population and diffusion speed at 6.5 TeV will provide valuable input for LHC collimator operation and future active halo control techniques.

- From inward and outward collimator scans, losses at each collimator step can be fit using a diffusion model to obtain the diffusion rate.

- Can also obtain p-to-Gy calibration factors for e.g. lifetime analysis, comparison to simulations…

- **Proposed MD programme (as done in 2012 @ 4 TeV):**
  - Injection (2 nominal / beam) -> Ramp -> Squeeze (~2 hour)
  - Retract IR7 TCPs from 5.5 to 7 σ, scrape separately with H/V, B1/B2 TCPs down to ~2 nominal σ (~2.5 hours)
    - ➡ slow scraping of 10-20 μm every 10-20 seconds
  - Retract TCPs to 5.5 σ, bring beams in collisions (~1 hour)
  - Repeat scraping in collisions (~2.5 hours)
  - **Total: 8 hours**

- The MD will be done in parallel to MD910 (off-momentum loss maps).

Halo measurements

- **Points raised by MPP:**
  - *Would pilot bunches be possible?* No, as we need to establish the collisions with the nominal orbit.
  - *Async dump mentioned in the MPP note?* Remnant from MD block 1 proposal - will not be done.
  - *Turning off of BLM-PM acquisition needed?* No, we do not intend to dump the beam with the scraping. In the past (and in the MD) we only ever turned off the UFO buster acquisition.
- **Changes to MP settings:**
  - Setup beam flag: needed to mask collimators and BLMs.
  - Collimators: need to open position thresholds to parking.
- **Recovery after MD:**
  - N/A: collimators will be driven back using sequence, no beam processes will be changed.