- Motivation
- Plan
Motivation

- The measured octupole threshold is significantly higher than predicted, mainly in the horizontal plane of B1 (top energy)
  - We are currently operating with 508 A, whereas ~200 A is predicted
- Direct measurement of the tune shift do not seem to show this discrepancy (detailed analysis ongoing)

**Tune shift vs. intensity**

- Clear tune shifts observed
  - From the first fill: the tune-shift is linear with bunch intensity as expected
  - Different tune-shifts are observed for the different collimators settings
  - From the second fill: large tune-shifts are observed for the high intensity bunch (1.9-10^{11})
  - For this bunch the tune-shifts are of the order of \( \frac{1}{4} Q_0 \) to \( \frac{1}{2} Q_0 \) (0.5\times10^{-3} to 1\times10^{-3})

**Data**

1, 2, 3: Commissioning tests (nominal non-colliding single bunches)
4, 5: ADT noise MD (high intensity single bunches)
6, 7: TMCI MD (nominal non-colliding single bunches)

→ Investigate the tune spread (MD2870: Instability with flat orbit)
**Motivation**

- The first bunches of the trains are affected
  - Similar observations in ADJUST during 2016

  
  
  -> Need to understand bunch position dependence

- Tested: Brightness, longitudinal shift (full detuning)
- Partially / not tested: Filling scheme, gap dependence, ADT gain
Plan

Fill 1:
- Inject 133 nominal bunches (non-colliding) in both beams with a dedicated filling scheme:
  - 1 single, 12b 25ns, 48b 25 ns, 48b 8b4e, 24b 50 ns
- At flat top, measure and correct the tunes and linear coupling kicking the single bunch
- Reduce the octupole current in steps, measure the instability threshold for the different bunches

Fill 2:
- Inject a single train of 48b 25ns (non-colliding) in both beams
- At flat top, remove the local non-linear correction in the IRs
- Measure and correct the tunes and linear coupling
- Reduce the octupole current in steps

Fill 2 alternative (Depending on the result of MD2870 on instability with flat orbit):
- Inject two trains of 48b 25ns (non-colliding) in both beam
- At flat top, adjust the ADT gain to different values for the two trains
- Measure and correct the tunes and linear coupling
- Reduce the octupole current in steps