

## Beta\*-reach: Collimation with tighter TCTs

The goal of the MD is to investigate the cleaning and background at a small beta\*, tentatively  $\beta^*=40\text{cm}$  (reference : talk by R. Bruce at <https://indico.cern.ch/event/365220/>). Another value of beta\* could possibly be established if the long-range beam-beam MD has been carried out and analyzed beforehand.

If the phase advance MKD-TCT is so far from 90 degrees that no MP margin is necessary, the TCT setting is limited inwards by experimental background and hierarchy considerations, and outwards by cleaning losses in the triplet. Therefore, the losses around the ring and on the TCTs in particular, and, if possible, experimental backgrounds in ATLAS and CMS, will be checked through a scan in TCT setting with loss maps at each step.

It is assumed that the optics has been corrected down to the chosen beta\* before the MD.

The procedure would be:

- Inject 1 nominal bunch (for having the correct orbit) and at least 10 pilots per ring. The MD could possibly be carried out using only pilots but the accuracy of the results might be worse (potentially worse hierarchy in IR7 due to orbit)
- Ramp, squeeze to 40cm, stay separated (if necessary for MP, consider collapsing crossing at 80cm for increased aperture)
- If MD "Beta\*-reach: IR aperture measurement at small beta" has been performed beforehand, introduce the same crossing angle
- Align in IR1/5 TCTs around new orbit using BPM buttons
- Move in secondary collimators in IR7, as well as the dump protection, by 0.5 sigma to establish 2 sigma retraction between TCP and TCS.
- Scan TCT setting between 7.8 sigma and 10.3 sigma, in steps of 0.5 sigma. At each step, check cleaning performance through loss maps with ADT excitation (B1 and B2, H and V). If possible, ATLAS and CMS could take data to monitor beam-halo induced background from the TCTs. Need at least 10 pilots per ring
- Move in TCTs to 6.8 sigma
- Finish fill by asynchronous dump test