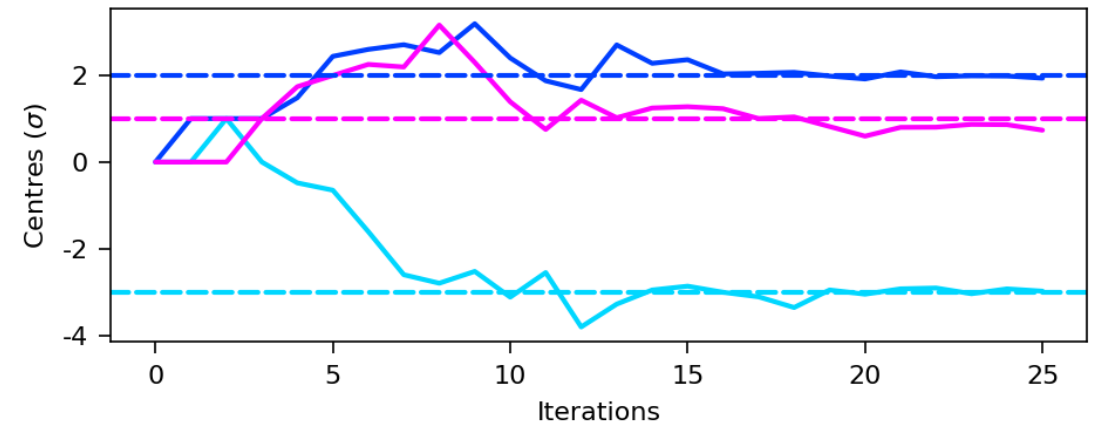
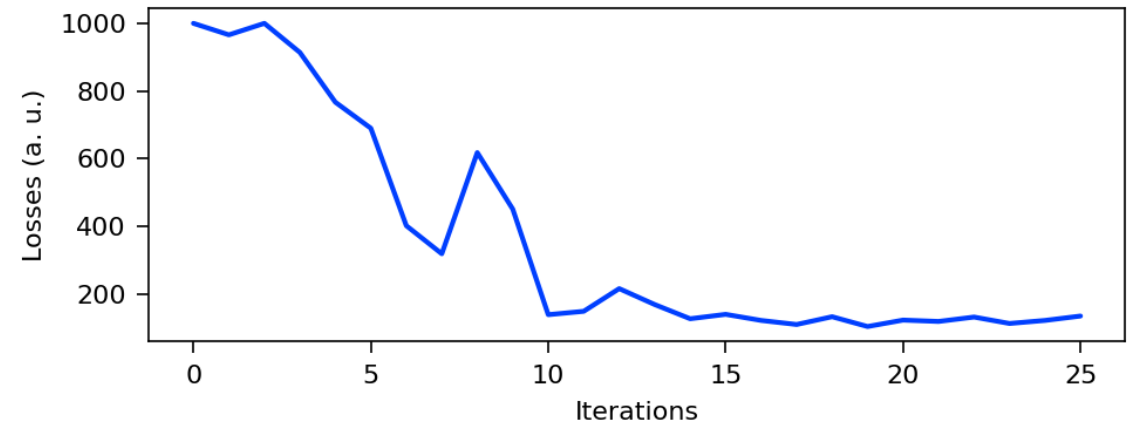


Automatic TCDI alignment MD

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Motivation

- TCDI alignment takes very long time
 - 6-7h in a very good day
- Only goal is to find the center of collimator jaws – already automated but still needed ~15 shots per collimator (using today's method)
- We can easily speed it up by using numerical optimizers!
 - ~20 iterations for 3 TCDIs → ~1h for both lines
 - Still to test different algorithms
- Need 8h with single PILOT on single TL in “inject and dump” (using MKD knob) – no matter which TI
 - Ideally would use a bit of time before the MD during other MDs with single bunches to test TCDI movement (without intercepting the beam!)



- Measure PILOT emittance in the SPS
- Prepare TL and LHC for TCDI alignment procedure (usual masking of interlocks)
- Verify Gy/p calibration of TCDIL for the TL under study
 - If calibration different from last year for first 2 TCDI, repeat calibration
- Set all TCDILs at 3 sigma gap
 - Verify that most of the beam still makes it to the end of the line
- Change TCDIL centres by a few mm
- Launch numerical optimizer to find back nominal TCDI centres
- Solve eventual bugs in the SW/procedure
- Repeat with different TCDI apertures (2, 3, 4 sigma) and different algorithms