



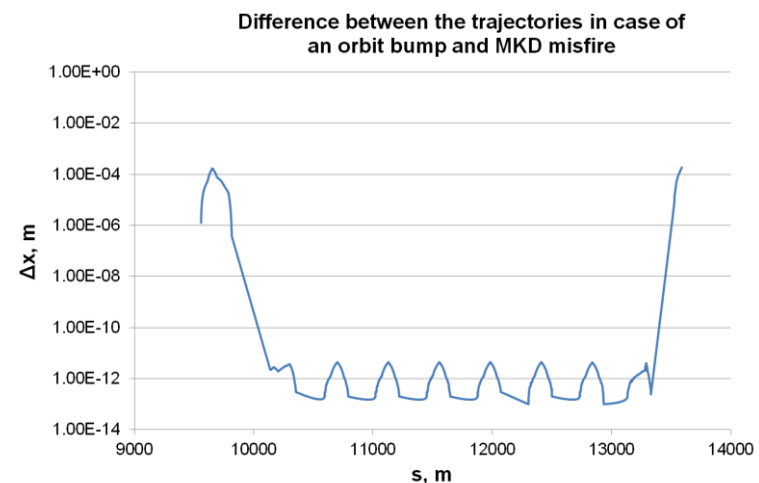
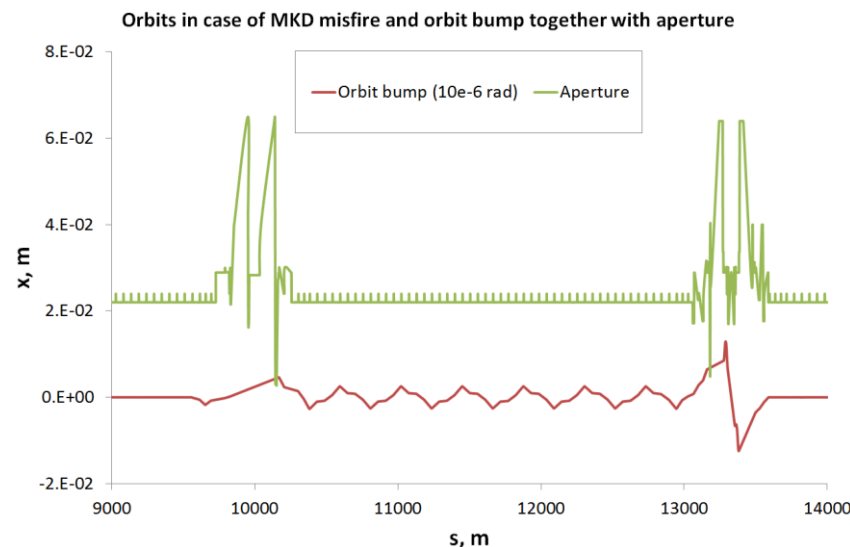
MPE MD request 2016

M. Valette, D. Wollmann

MD67: New method for validation of aperture margins in the LHC triplet

Courtesy V. Chetvertkova

- Independent method to **validate the aperture margins** between IR6 (TCDQ/TCSG) and most exposed triplets/TCTs in case of the MKD misfire.
- Use **4-corrector orbit bump** to reproduce the **MKD misfire** with various kick strengths.
- Derive aperture margin between TCDQ and TCT in respective triplet with **circulating beam**.
- Independent method to measure aperture margins **requested by MPP for ATS optics**.
- verify method with both beams at IP1 and IP5, with **injection and ATS optics**.

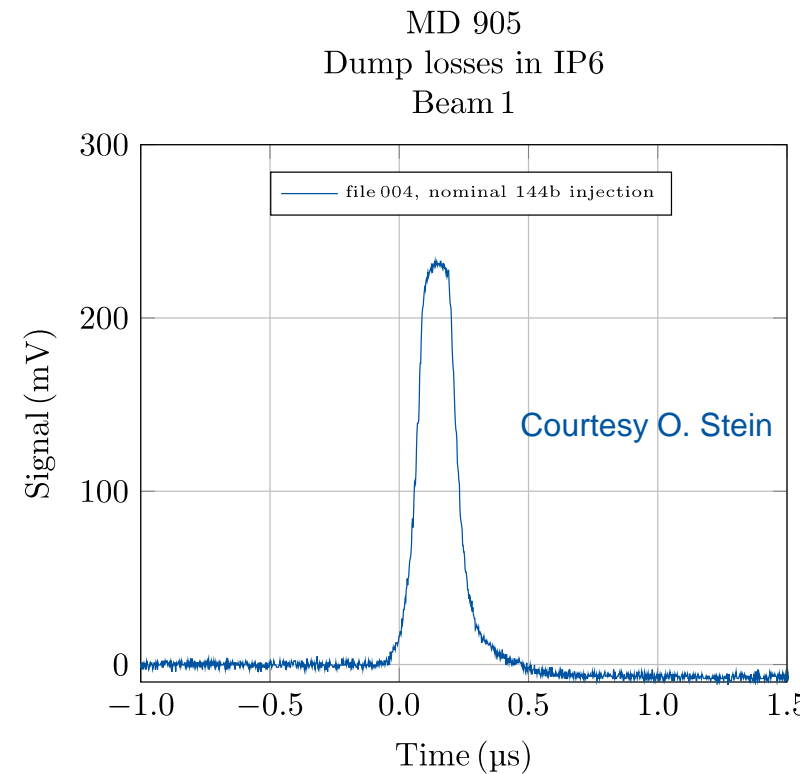


MD67: Description

- Intensities: 2x small nominal bunches (to guarantee correct orbit) and several pilot bunches; $I_{\text{tot}} < 3 \times 10^{11}$.
- 450GeV and 6.5TeV.
- B2 and B1.
- Partially open TCDQ/TCSP (IP6) and TCTs → partial opening of IP7 collimators required for bump to IP1.
- Establishment of a global 4-corrector orbit bump from IP6 to the triplet (IP5/IP1).
- Increase bump amplitude step wise until losses registered in triplet → blow-out pilot bunches with ADT
- Successive moving in of hor. TCT, TCDQ/TCSP
- Observe shift of losses from triplet to TCT to TCDQ/TCSP.
- Time required: 8h per beam.
- Responsible: M. Valette, R. Schmidt, D. Wollmann

Calibration of diamond particle detectors in IP6

- Diamond particle detectors (dBLM) installed **close to TCSP-IR6 to record losses during beam dumps.**
- **Calibrate response** to number of particles impacting on TCDQ.
- Ensure that **dBLM signals not saturated** during asynchronous beam dump with full machine.
- First calibrations possible during regular asynchronous beam dump tests possible.
- Verification with higher abort gap intensities necessary.

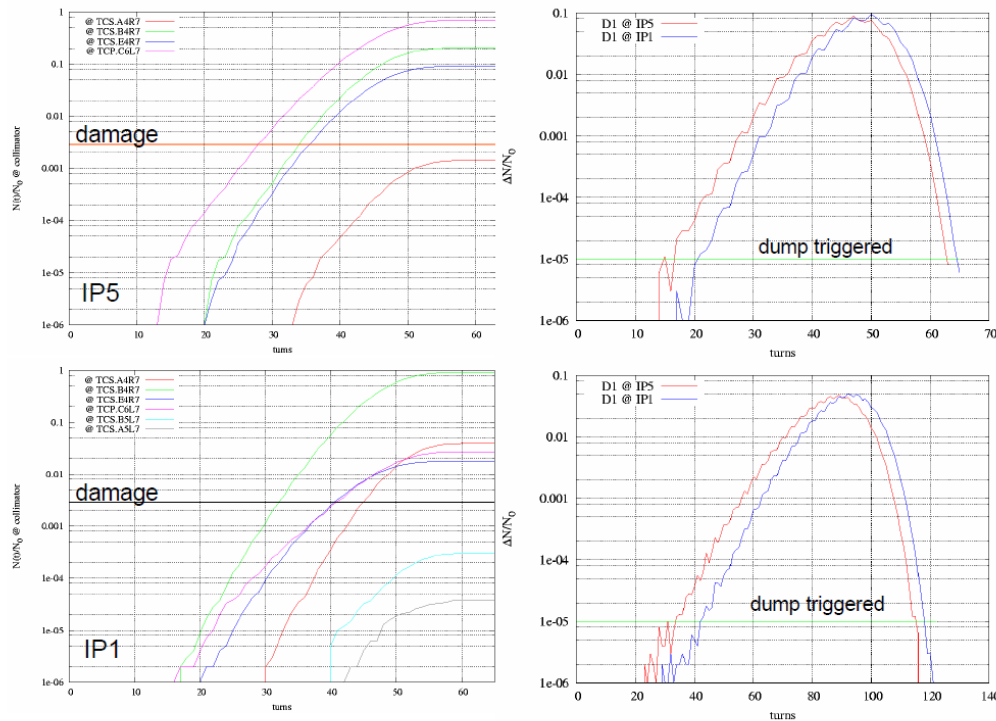


Description

- Intensities: 3 nominal bunches close to abort gap;
 $I_{\text{tot}} < 3 \times 10^{11}$.
- B1 and B2
- 450GeV and 6.5TeV.
- Nominal machine settings.
- Switch off RF and observe the leakage of bunches into the abort gap.
- Dump the beam.
- Time required: 8h.
- Responsible: M. Valette, O. Stein, D. Wollmann

Measure effect of D1 powering failure on beam

- Measure the effect of a powering failure in D1 (IP1/5) on the circulating beam @ 6.5 TeV with $\beta^* = 40/50$ cm.
- Verify the protection assumptions (FMCM, etc) and modeling in view of new circuits for HL-LHC.



Courtesy V. Kain

Description

- Intensities: Several pilot bunches; $I_{\text{tot}} < 3 \times 10^{11}$.
- 450 GeV and 6.5 TeV.
- B1 and B2
- Mask Fast Magnet Current Change Monitor (FMCM)
- Initiate D1 powering failure and record losses
- Time required: 8h.
- Responsible: M. Valette, D. Wollmann



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