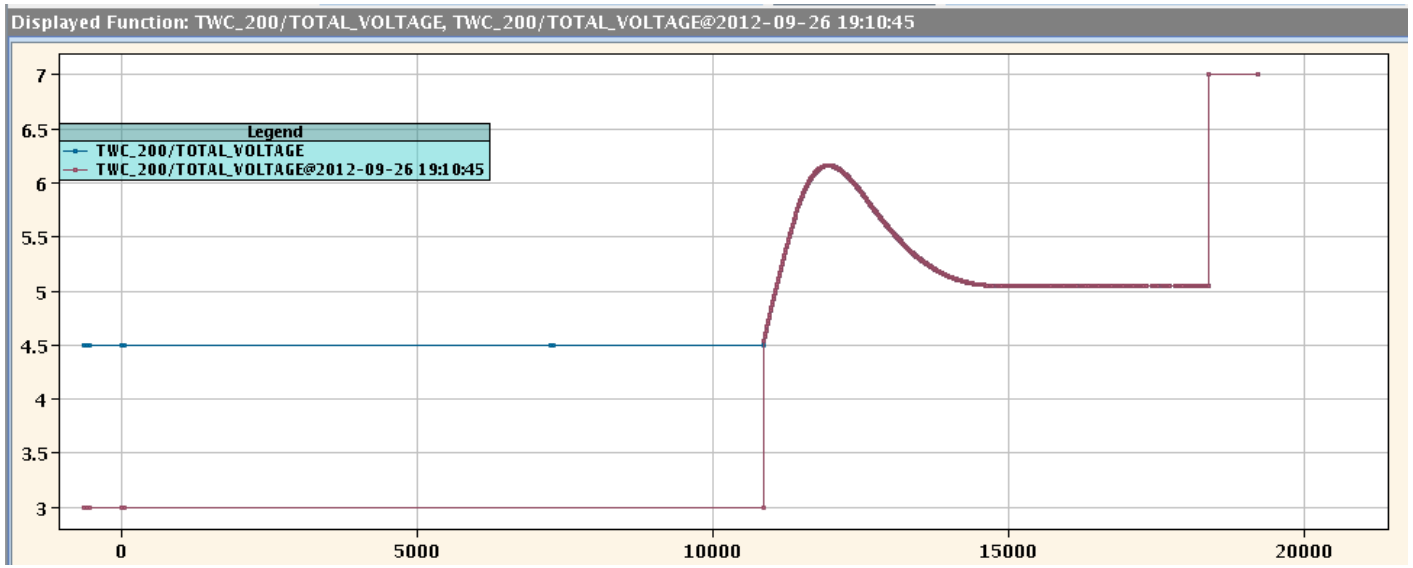
Beam quality of the 50 ns LHC beam with Q20 2012-09-26

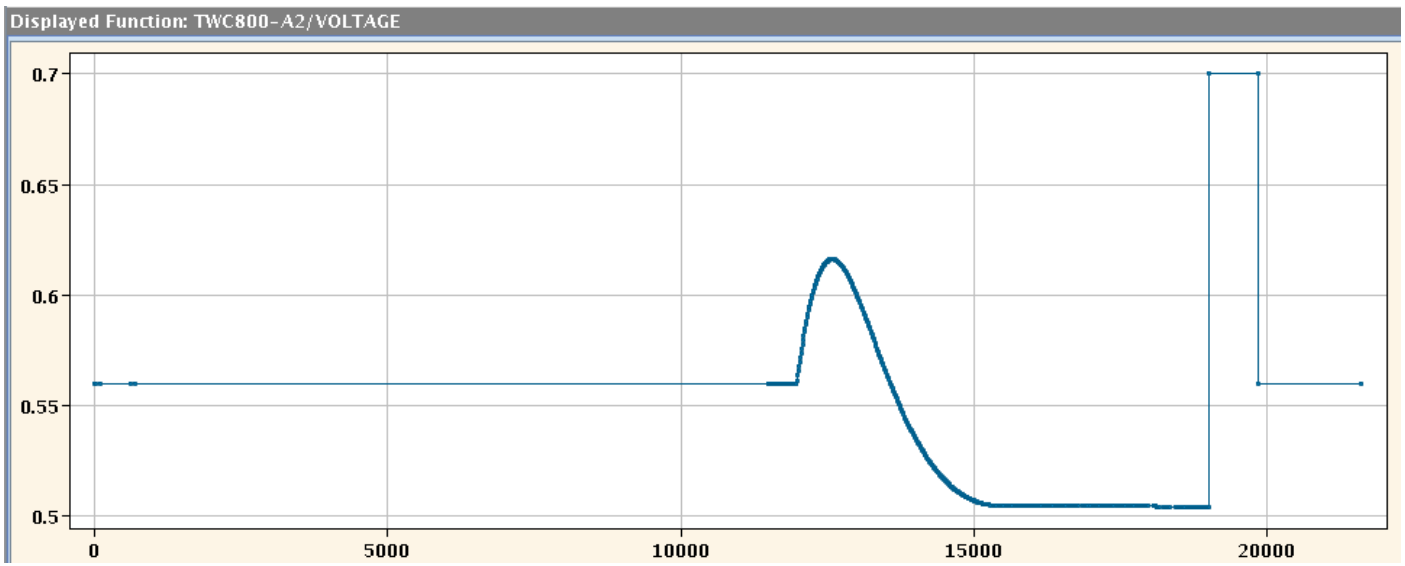
LIU SPS BD WG 2012-09-27

Principal conditions I

- LHCMD_50ns_D_Q20_2011_V1 (ID: 768), 10 860 ms long flat bottom, ramp with $\dot{B}_{\mathrm{max}} = 0.35$ T/s
- modification of 200 MHz RF voltage at flat bottom, BUP off/on
- 4 batches of 36 bunches
- average bunch intensity at flat top $N_{\mathrm{Q}} = (1.56 \pm 0.02) \times 10^{11}$
- APWL/BQM data
- 2012-09-26 19:11 to 19:56

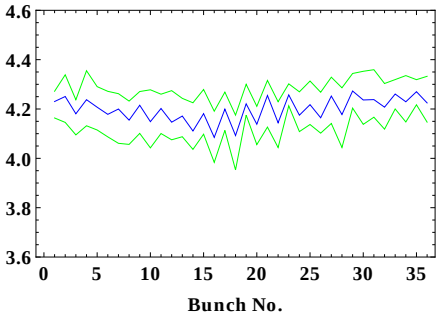
Principal conditions II

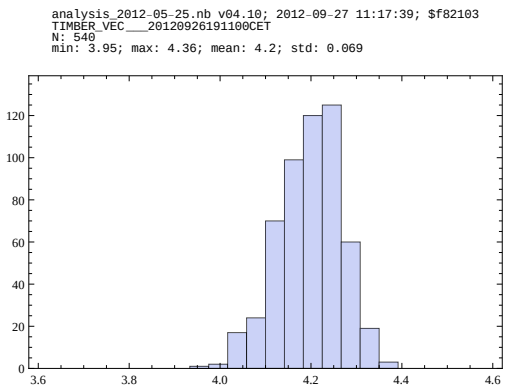




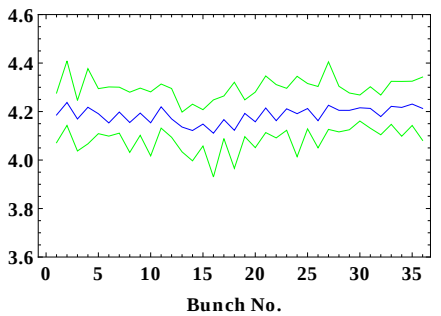
Beam quality at injection

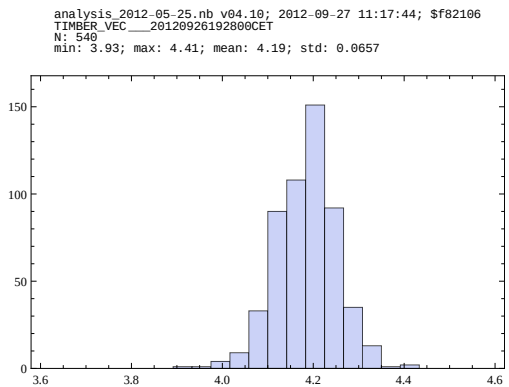
3.0 MV, BUP off



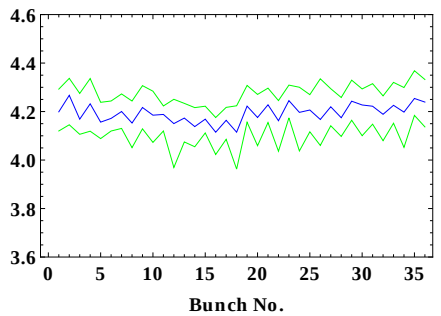


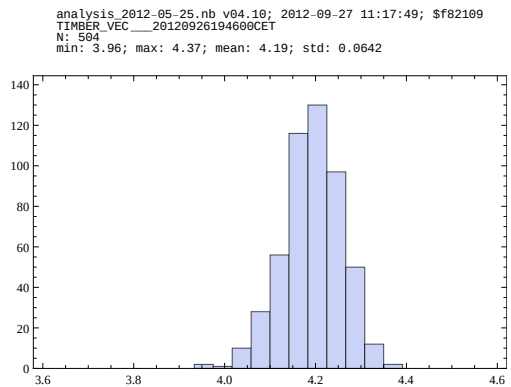
4.5 MV, BUP off





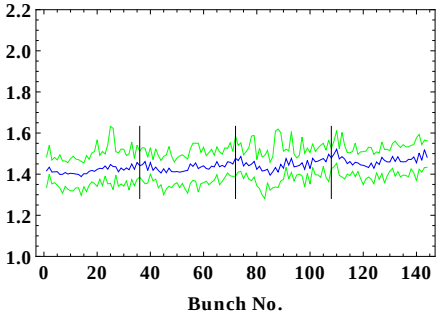
4.5 MV, BUP on

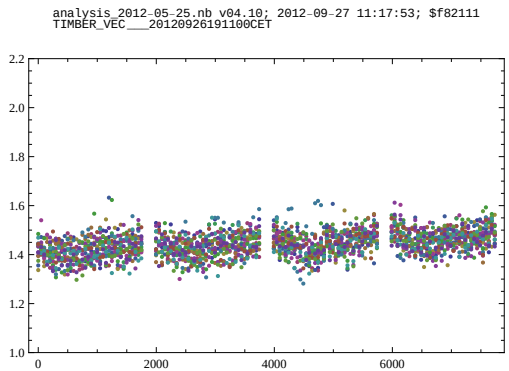


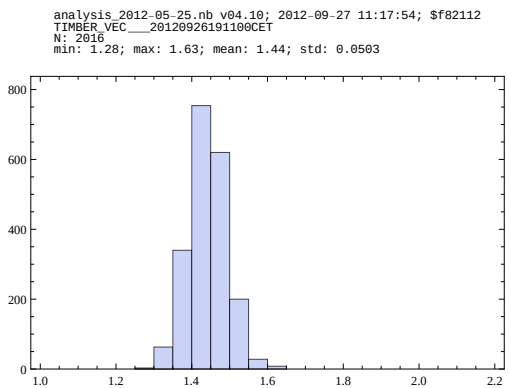


Beam quality at flat top I

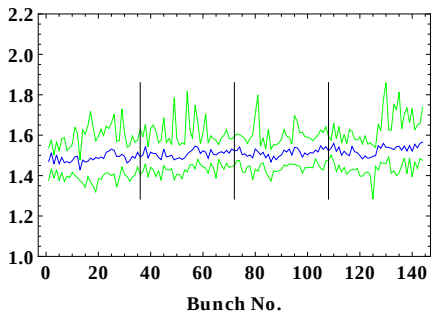
3.0 MV, BUP off

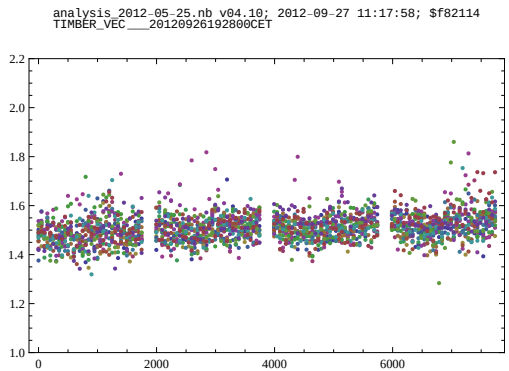


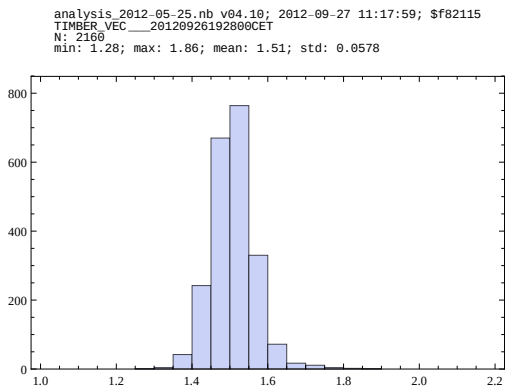




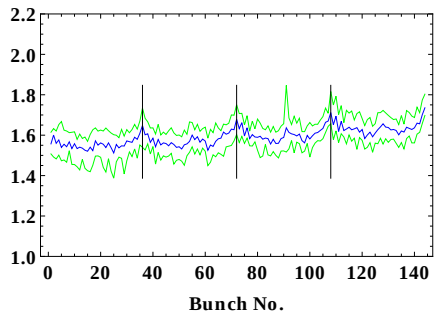
4.5 MV, BUP off

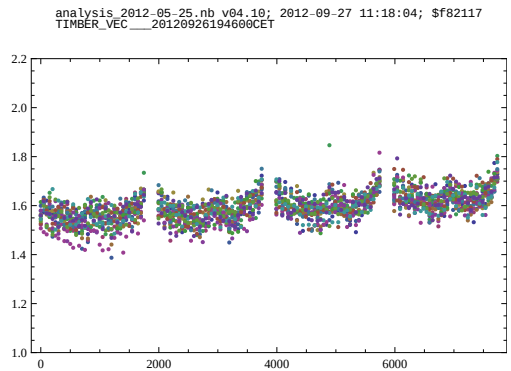


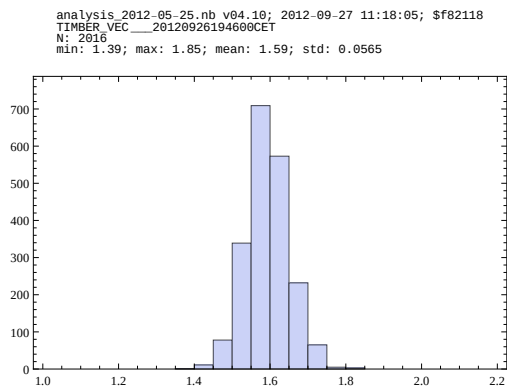




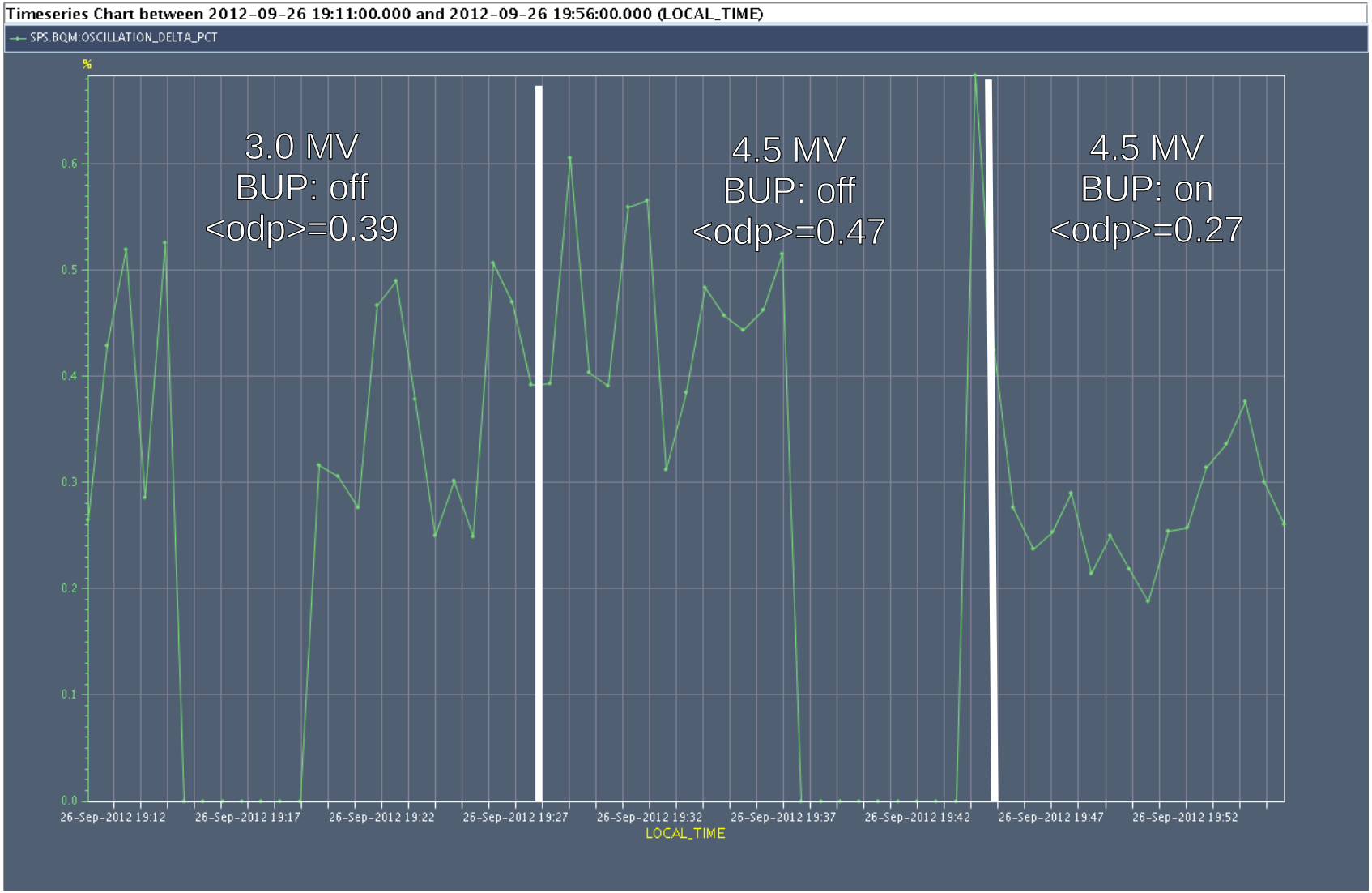
4.5 MV, BUP on



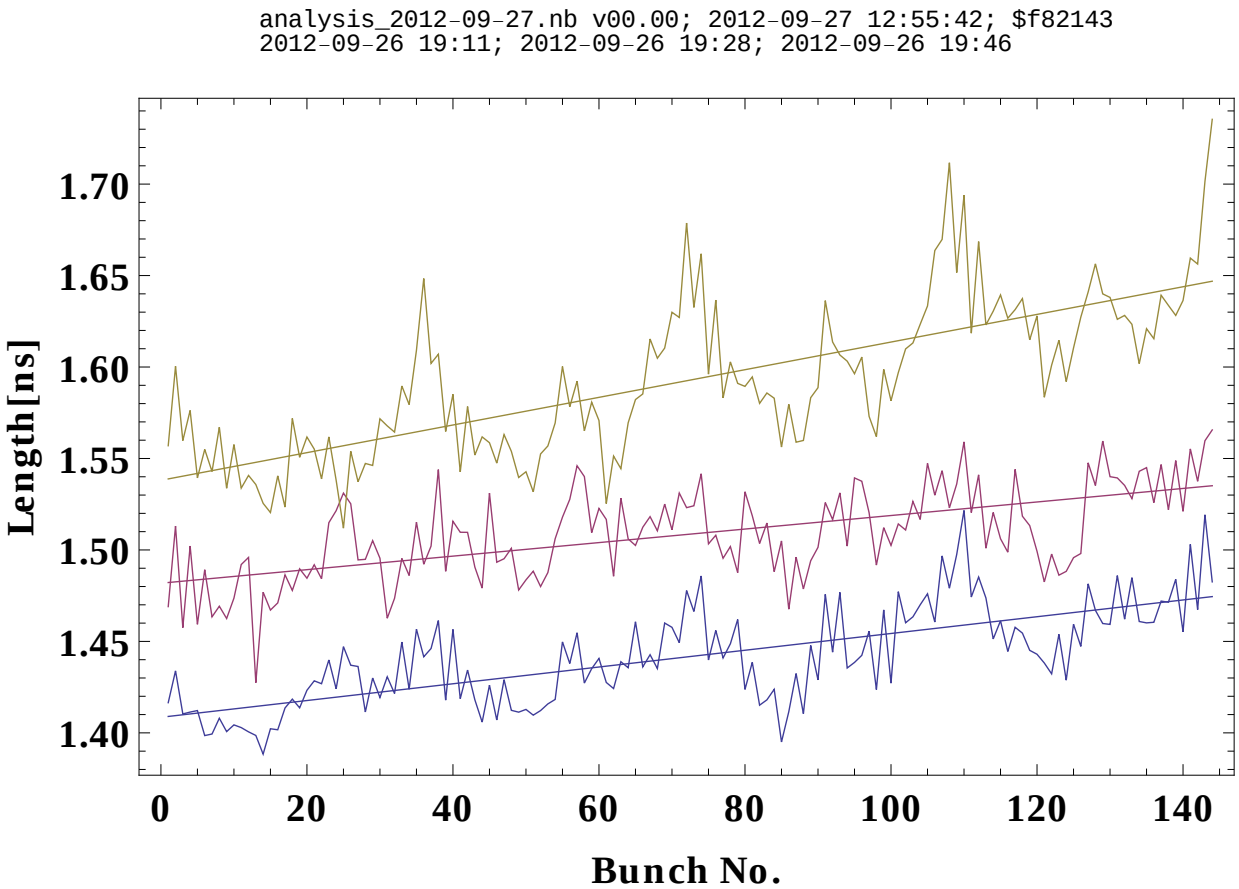




Beam quality at flat top II



Beam quality at flat top III



m [ns]		
3.0 MV, BUP off	4.5 MV, BUP off	4.5 MV, BUP on
$(4.5 \pm 0.4) \times 10^{-4}$	$(3.7 \pm 0.4) \times 10^{-4}$	$(7.6 \pm 0.6) \times 10^{-4}$

Conclusions

Influence of 200 MHz RF voltage at flat bottom

- bunch length distribution
- stability at flat top (dipole, quadrupole)
- m

Influence of BUP

- bunch length distribution
- stability at flat top (dipole, quadrupole)
- bunch length modulation along batches
- m