

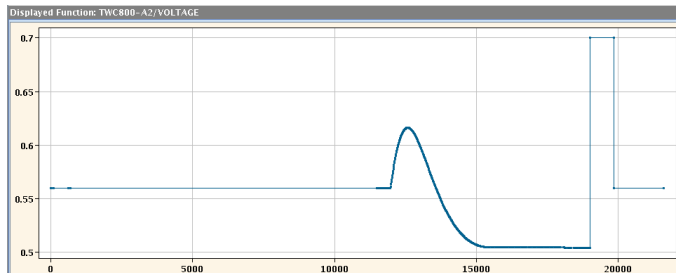
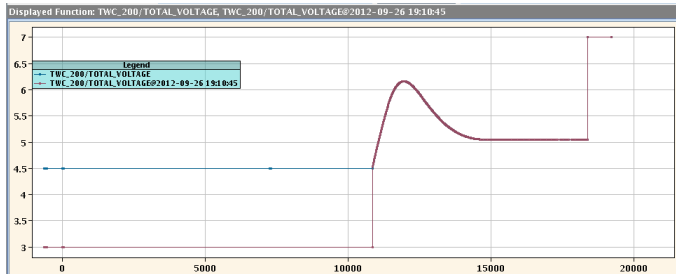
Beam quality of the 50 ns LHC beam with Q20
2012-09-26

LIU SPS BD WG 2012-09-27

Principal conditions I

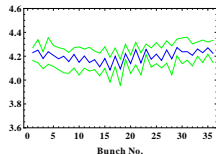
- ▶ LHCMD_50ns_D_Q20_2011_V1 (ID: 768), 10 860 ms long flat bottom, ramp with $\dot{B}_{\max} = 0.35$ T/s
- ▶ modification of 200 MHz RF voltage at flat bottom, BUP off/on
- ▶ 4 batches of 36 bunches
- ▶ average bunch intensity at flat top $N_Q = (1.56 \pm 0.02) \times 10^{11}$
- ▶ APWL/BQM data
- ▶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

Principal conditions II

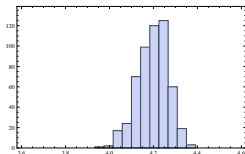


Beam quality at injection

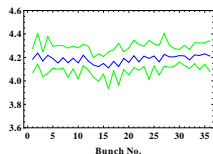
3.0 MV, BUP off



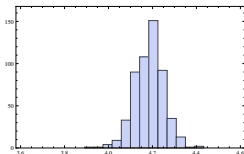
analysis_2012-05-25_db_v04.10; 2012-09-27 11:17:39; \$E82103
TName: Var____0120928191100C07
N: 542
Min: 3.96; max: 4.36; mean: 4.2; std: 0.069



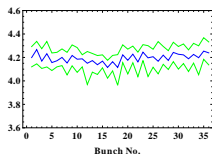
4.5 MV, BUP off



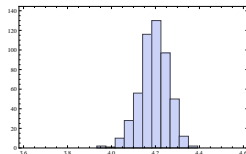
analysis_2012-05-25_db_v04.10; 2012-09-27 11:17:44; \$E82106
TName: Var____0120928192800C07
N: 542
Min: 3.93; max: 4.41; mean: 4.19; std: 0.0657



4.5 MV, BUP on

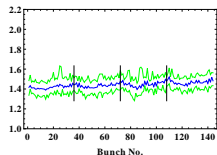


analysis_2012-05-25_db_v04.10; 2012-09-27 11:17:49; \$E82109
TName: Var____0120928194000C07
N: 554
Min: 3.96; max: 4.37; mean: 4.19; std: 0.0642



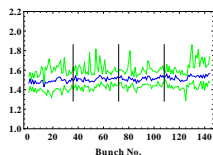
Beam quality at flat top I

3.0 MV, BUP off



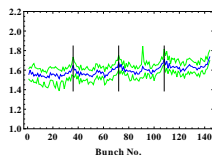
analysis_2012-05-25_nh_v04.10; 2012-09-27 11:17:53; SFR2111
TIMBER_VOC___20120926191100CCT

4.5 MV, BUP off

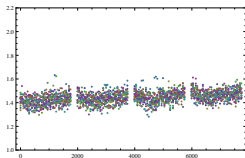


analysis_2012-05-25_nh_v04.10; 2012-09-27 11:17:58; SFR2114
TIMBER_VOC___20120926192800CCT

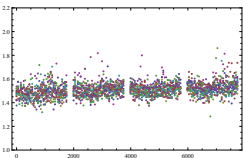
4.5 MV, BUP on



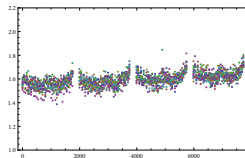
analysis_2012-05-25_nh_v04.10; 2012-09-27 11:18:04; SFR2117
TIMBER_VOC___20120926194600CCT



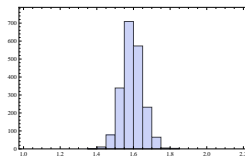
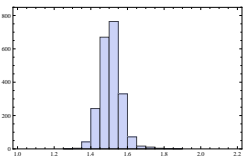
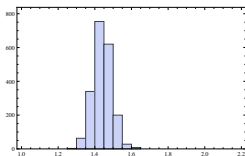
analysis_2012-05-25_nh_v04.10; 2012-09-27 11:17:54; SFR2112
TIMBER_VOC___20120926191100CCT
N: 2018
min: 1.28; max: 1.63; mean: 1.44; std: 0.0503



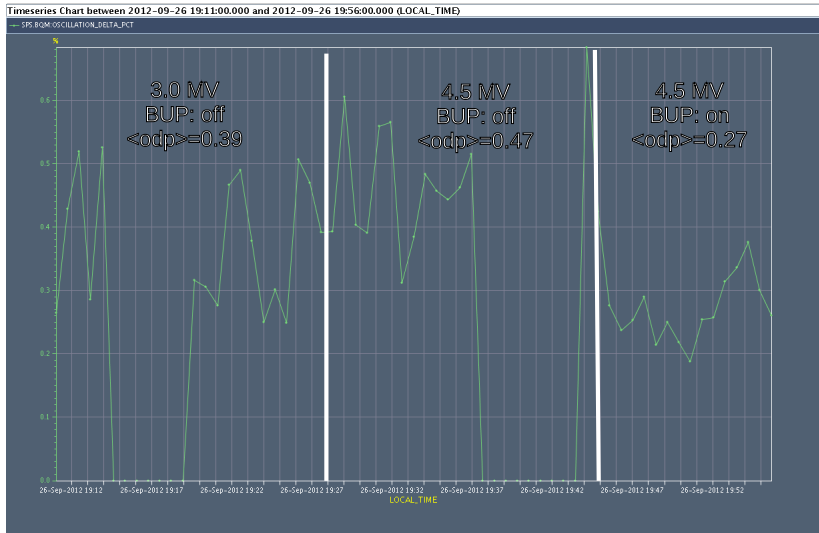
analysis_2012-05-25_nh_v04.10; 2012-09-27 11:17:59; SFR2115
TIMBER_VOC___20120926192800CCT
N: 2142
min: 1.28; max: 1.86; mean: 1.51; std: 0.0578



analysis_2012-05-25_nh_v04.10; 2012-09-27 11:18:05; SFR2118
TIMBER_VOC___20120926194600CCT
N: 2016
min: 1.39; max: 1.85; mean: 1.59; std: 0.0545

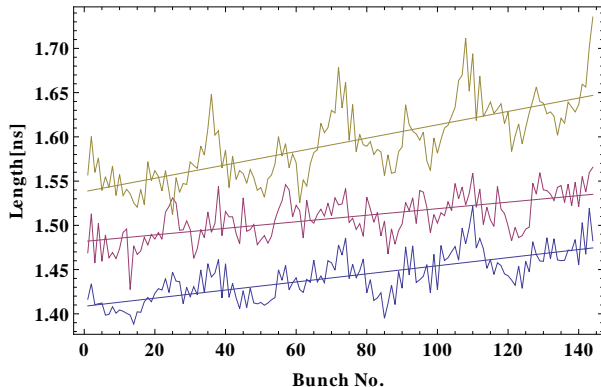


Beam quality at flat top II



Beam quality at flat top III

analysis_2012-09-27.nb v00.00; 2012-09-27 12:55:42; \$f82143
2012-09-26 19:11; 2012-09-26 19:28; 2012-09-26 19:46



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