3rd order calibration of analogue feedback data

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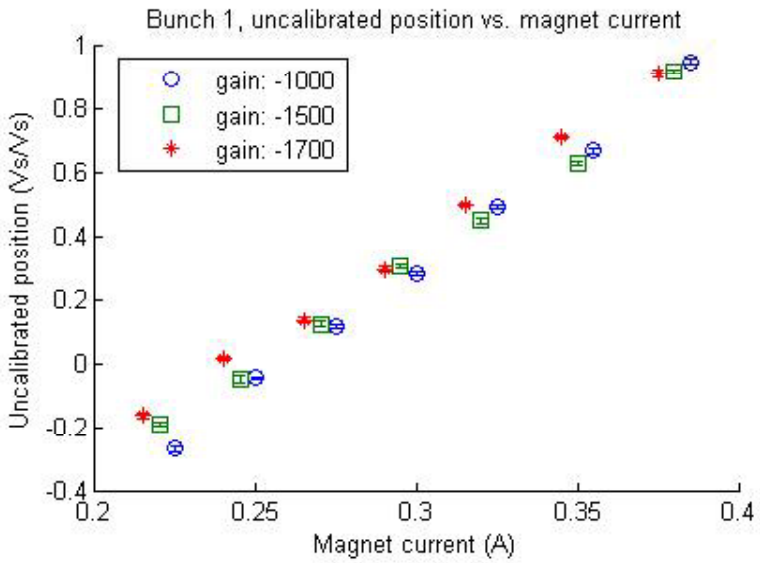
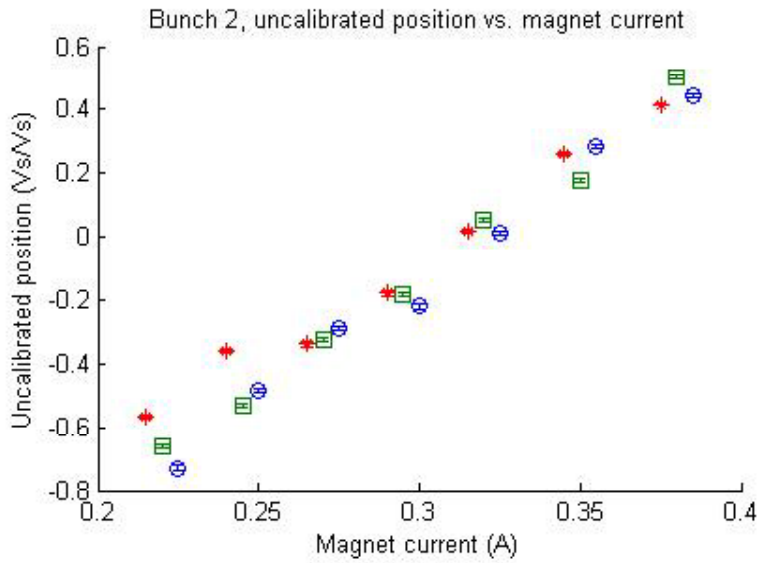
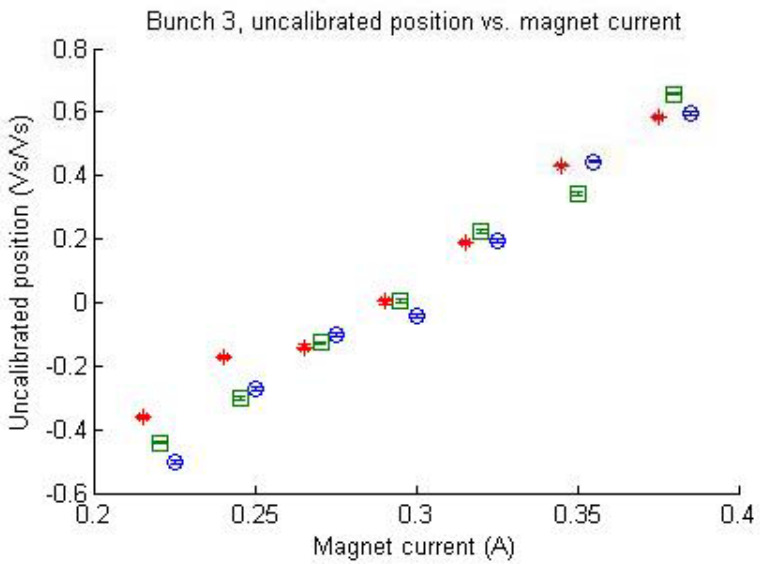
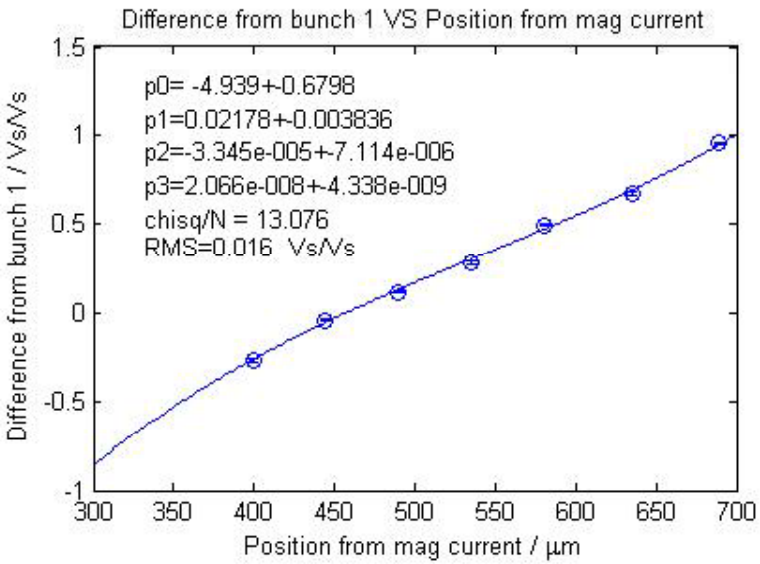
Setup

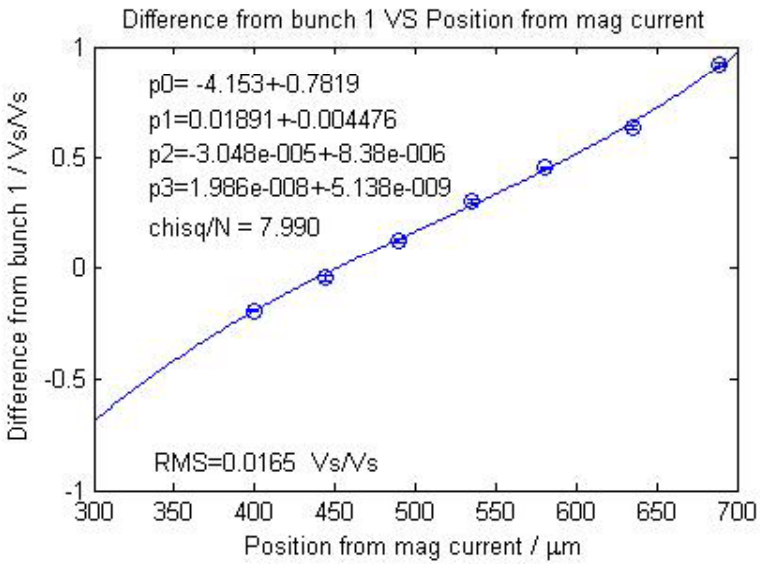
- 2 processors on BPM11
- Stripline signals split 2 ways
- 1 pair of signals to feedback processor (digital)
- 1 pair of signals to eel’s bedroom to processor there (analogue)
- Processors calibrated against magnet zv7x

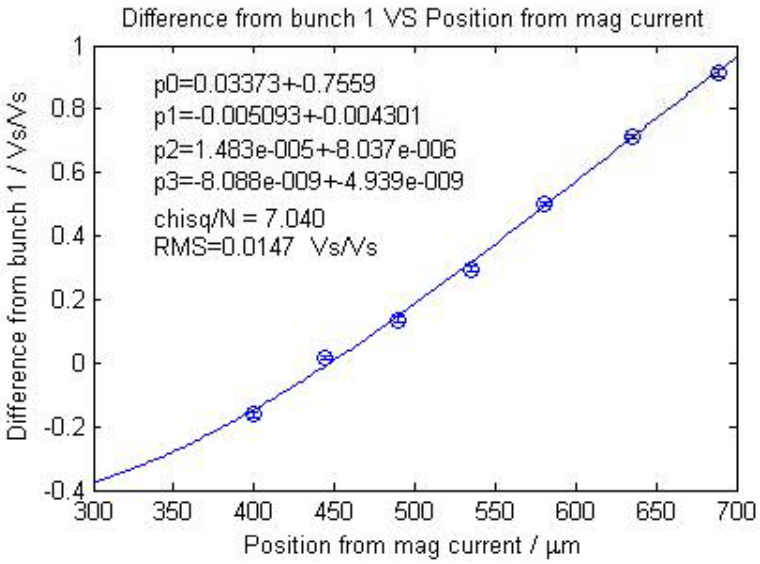

Bunch 1, uncalibrated position vs. magnet current
gain: -1000
gain: -1500
gain: -1700
Uncalibrated position (Vs/Vs)
Magnet current (A)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
0.2
0.25
0.3
0.35
0.4

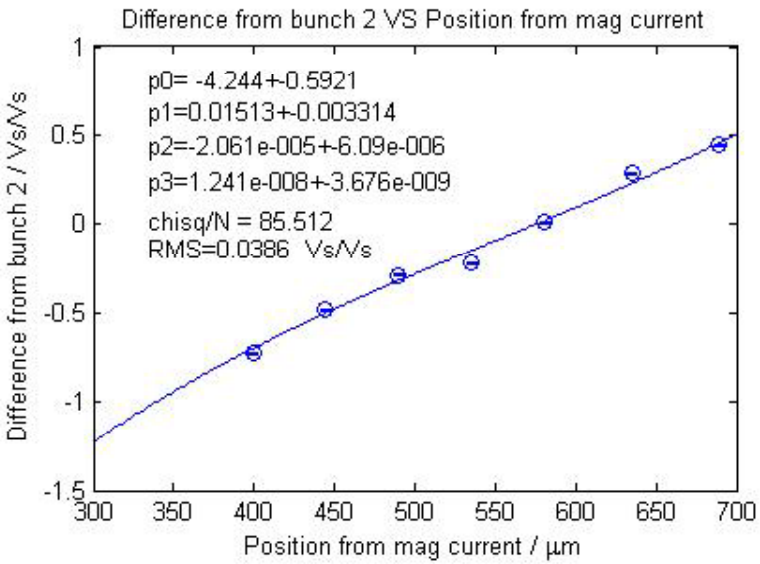

Bunch 2, uncalibrated position vs. magnet current
Uncalibrated position (Vs/Vs)
Magnet current (A)
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0.2
0.25
0.3
0.35
0.4

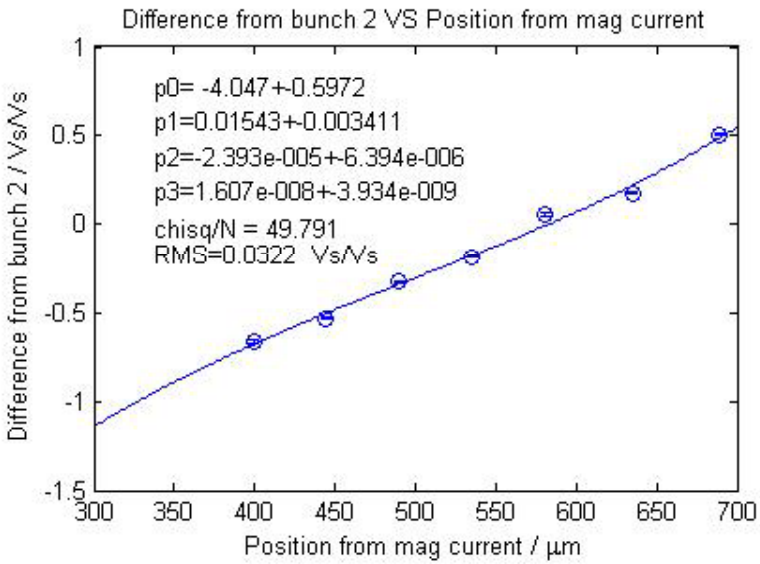

Bunch 3, uncalibrated position vs. magnet current
Uncalibrated position (Vs/Vs)
Magnet current (A)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0.2
0.25
0.3
0.35
0.4

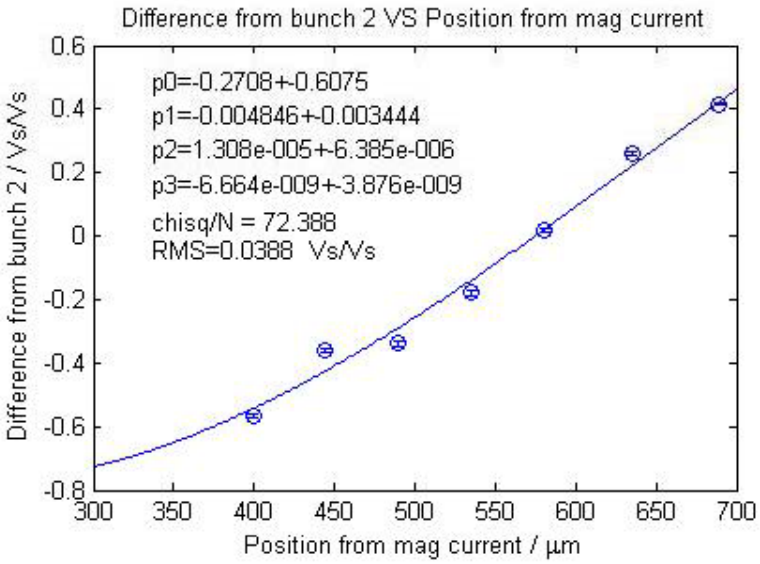

Difference from bunch 1 VS Position from mag current
p0= -4.939+-0.6798
p1=0.02178+-0.003836
p2=-3.345e-005+-7.114e-006
p3=2.066e-008+-4.338e-009
chisq/N = 13.076
RMS=0.016 Vs/Vs
Difference from bunch 1 / Vs/Vs
Position from mag current / µm

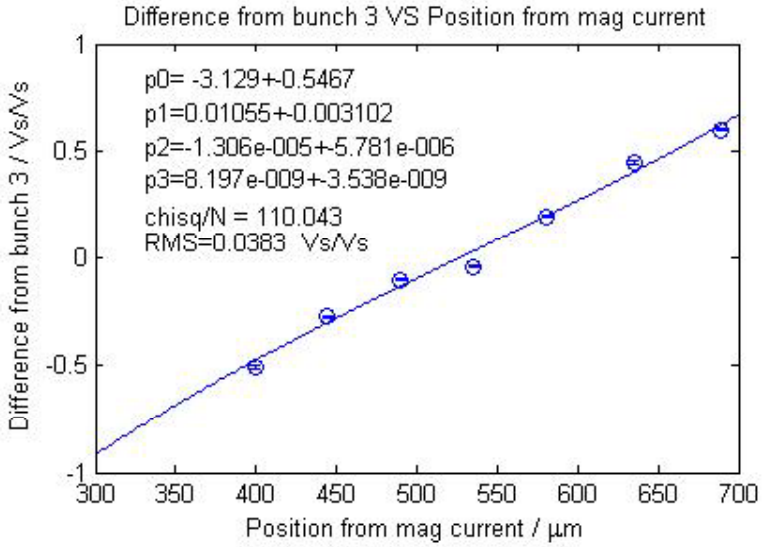

Difference from bunch 1 VS Position from mag current
p0= -4.153+-0.7819
p1=0.01891+-0.004476
p2=-3.048e-005+-8.38e-006
p3=1.986e-008+-5.138e-009
chisq/N = 7.990
RMS=0.0165 Vs/Vs
Difference from bunch 1 / Vs/Vs
Position from mag current / µm

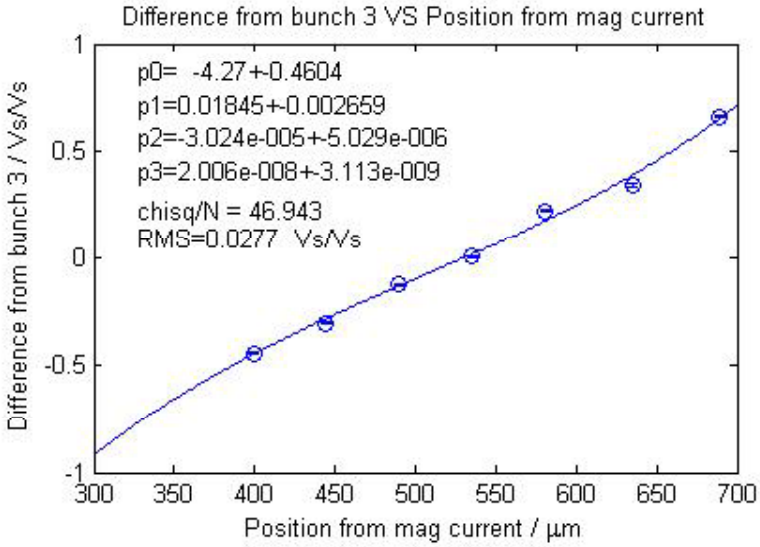

Difference from bunch 1 VS Position from mag current
p0=0.03373+-0.7559
p1=-0.005093+-0.004301
p2=1.483e-005+-8.037e-006
p3=-8.088e-009+-4.939e-009
chisq/N = 7.040
RMS=0.0147 Vs/Vs
Difference from bunch 1 / Vs/Vs
Position from mag current / µm

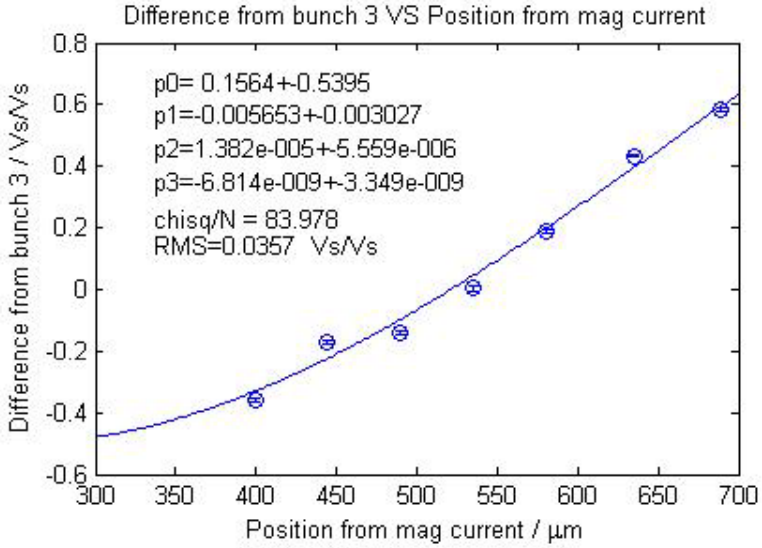

Difference from bunch 2 VS Position from mag current
p0= -4.244+-0.5921
p1=0.01513+-0.003314
p2=-2.061e-005+-6.09e-006
p3=1.241e-008+-3.676e-009
chisq/N = 85.512
RMS=0.0386 Vs/Vs
Difference from bunch 2 / Vs/Vs
Position from mag current / µm

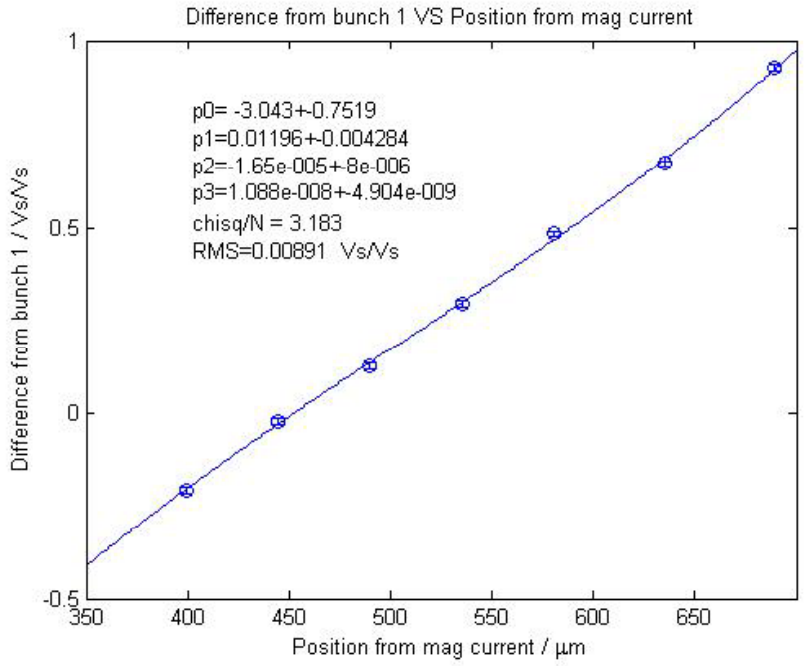

Difference from bunch 2 VS Position from mag current
p0= -4.047+-0.5972
p1=0.01543+-0.003411
p2=-2.393e-005+-6.394e-006
p3=1.607e-008+-3.934e-009
chisq/N = 49.791
RMS=0.0322 Vs/Vs
Difference from bunch 2 / Vs/Vs
Position from mag current / µm

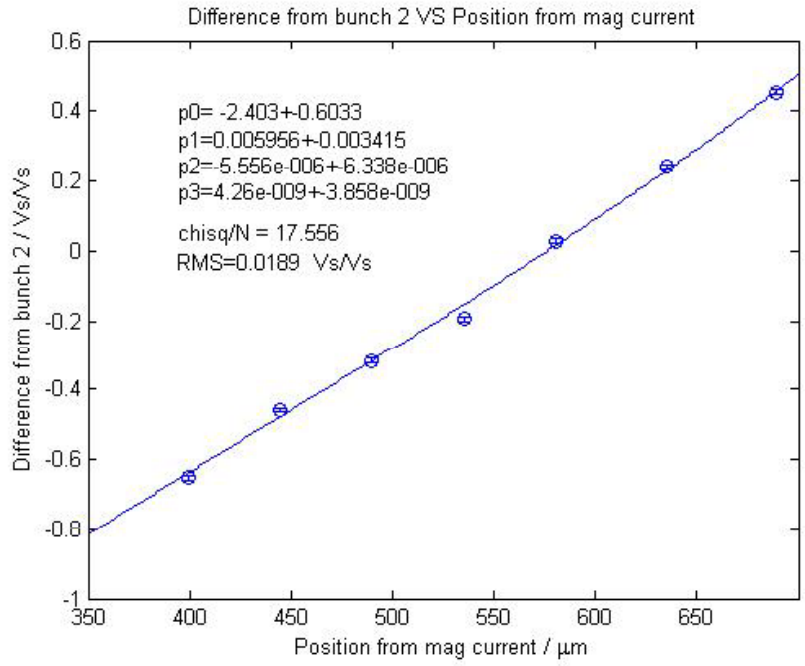

Difference from bunch 2 VS Position from mag current
p0=-0.2708+-0.6075
p1=-0.004846+-0.003444
p2=1.308e-005+-6.385e-006
p3=-6.664e-009+-3.876e-009
chisq/N = 72.388
RMS=0.0388 Vs/Vs
Difference from bunch 2 / Vs/Vs
Position from mag current / µm

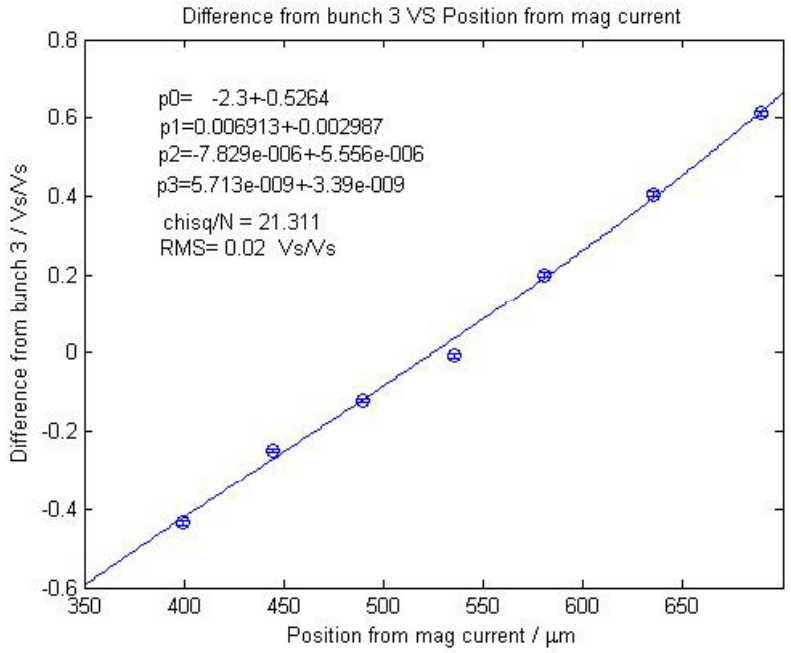

Difference from bunch 3 VS Position from mag current
p0= -3.129+-0.5467
p1=0.01055+-0.003102
p2=-1.306e-005+-5.781e-006
p3=8.197e-009+-3.538e-009
chisq/N = 110.043
RMS=0.0383 Vs/Vs
Difference from bunch 3 / Vs/Vs
Position from mag current / µm

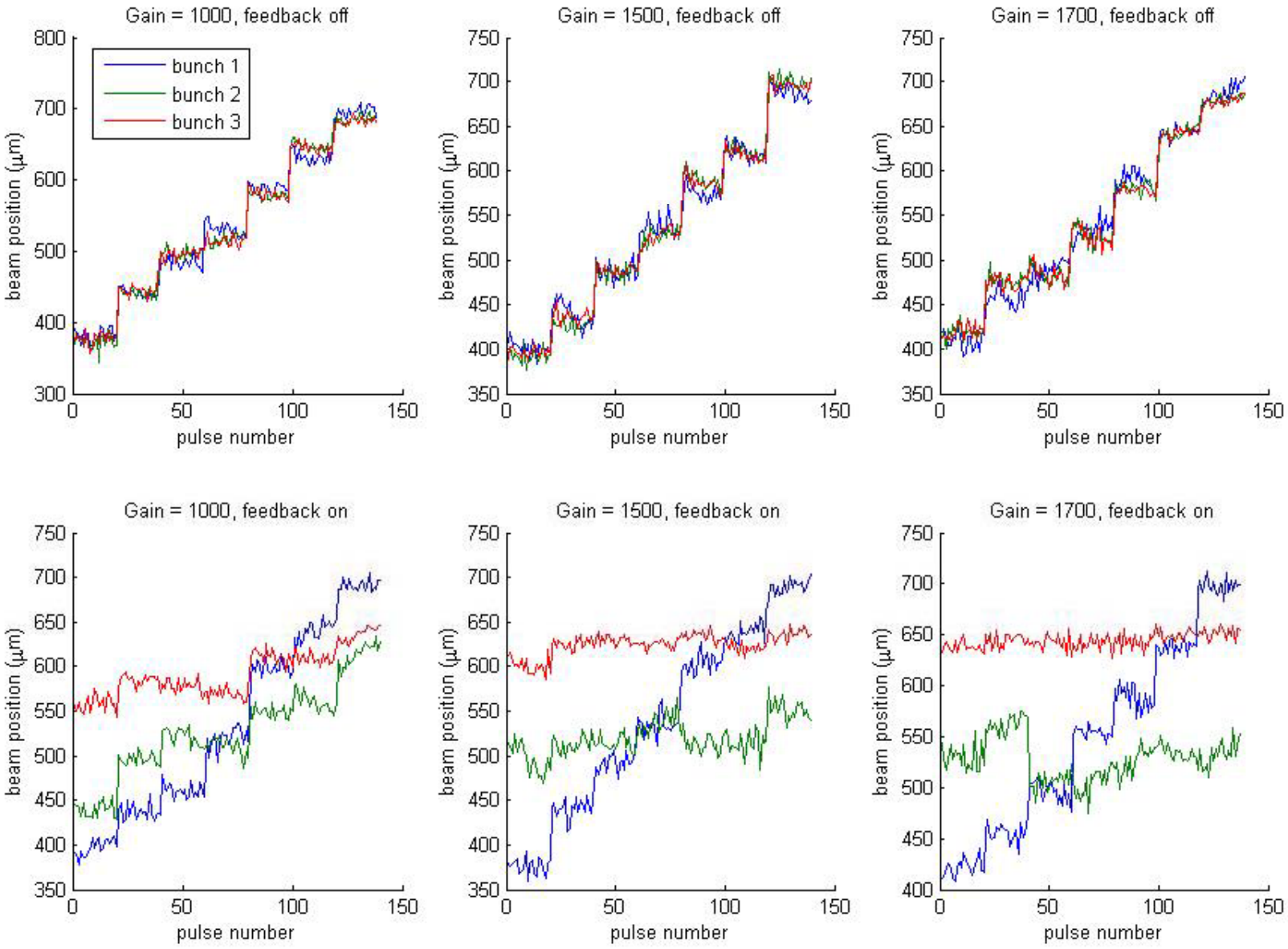

Difference from bunch 3 VS Position from mag current
p0= -4.27+-0.4604
p1=0.01845+-0.002659
p2=-3.024e-005+-5.029e-006
p3=2.006e-008+-3.113e-009
chisq/N = 46.943
RMS=0.0277 Vs/Vs
Difference from bunch 3 / Vs/Vs
Position from mag current / µm


Difference from bunch 3 VS Position from mag current
p0= 0.1564+-0.5395
p1=-0.005653+-0.003027
p2=1.382e-005+-5.559e-006
p3=-6.814e-009+-3.349e-009
chisq/N = 83.978
RMS=0.0357 Vs/Vs
Difference from bunch 3 / Vs/Vs
Position from mag current / µm


Difference from bunch 1 VS Position from mag current
p0= -3.043+-0.7519
p1=0.01196+-0.004284
p2=-1.65e-005+-8e-006
p3=1.088e-008+-4.904e-009
chisq/N = 3.183
RMS=0.00891 Vs/Vs
Difference from bunch 1 / Vs/Vs
Position from mag current / µm


Difference from bunch 2 VS Position from mag current
p0= -2.403+-0.6033
p1=0.005956+-0.003415
p2=-5.556e-006+-6.338e-006
p3=4.26e-009+-3.858e-009
chisq/N = 17.556
RMS=0.0189 Vs/Vs
Difference from bunch 2 / Vs/Vs
Position from mag current / µm


Difference from bunch 3 VS Position from mag current
p0= -2.3+-0.5264
p1=0.006913+-0.002987
p2=-7.829e-006+-5.556e-006
p3=5.713e-009+-3.39e-009
chisq/N = 21.311
RMS= 0.02 Vs/Vs
Difference from bunch 3 / Vs/Vs
Position from mag current / µm


Gain = 1000, feedback off
Gain = 1500, feedback off
Gain = 1700, feedback off
Gain = 1000, feedback on
Gain = 1500, feedback on
Gain = 1700, feedback on
bunch 1
bunch 2
bunch 3
beam position (μm)
pulse number