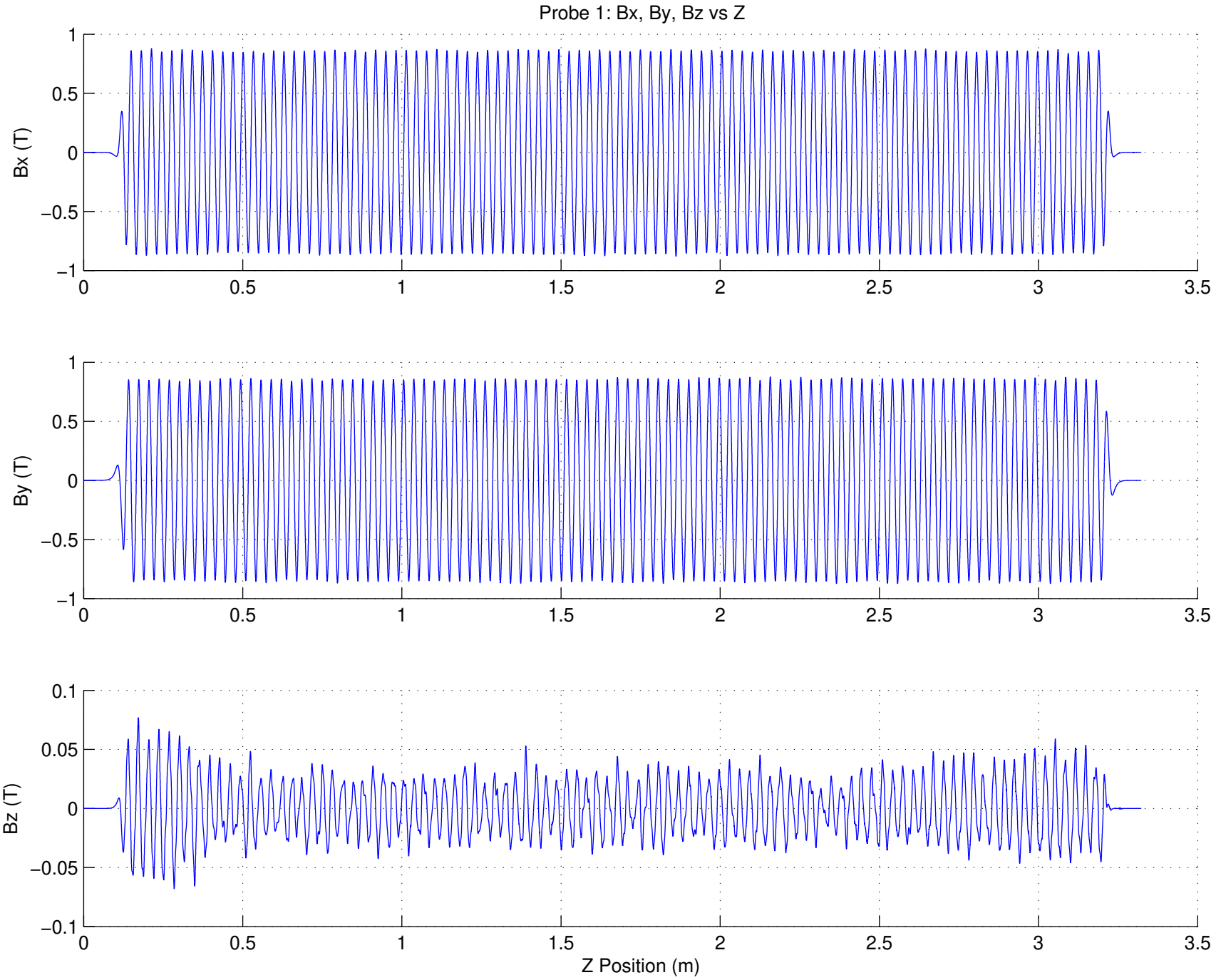
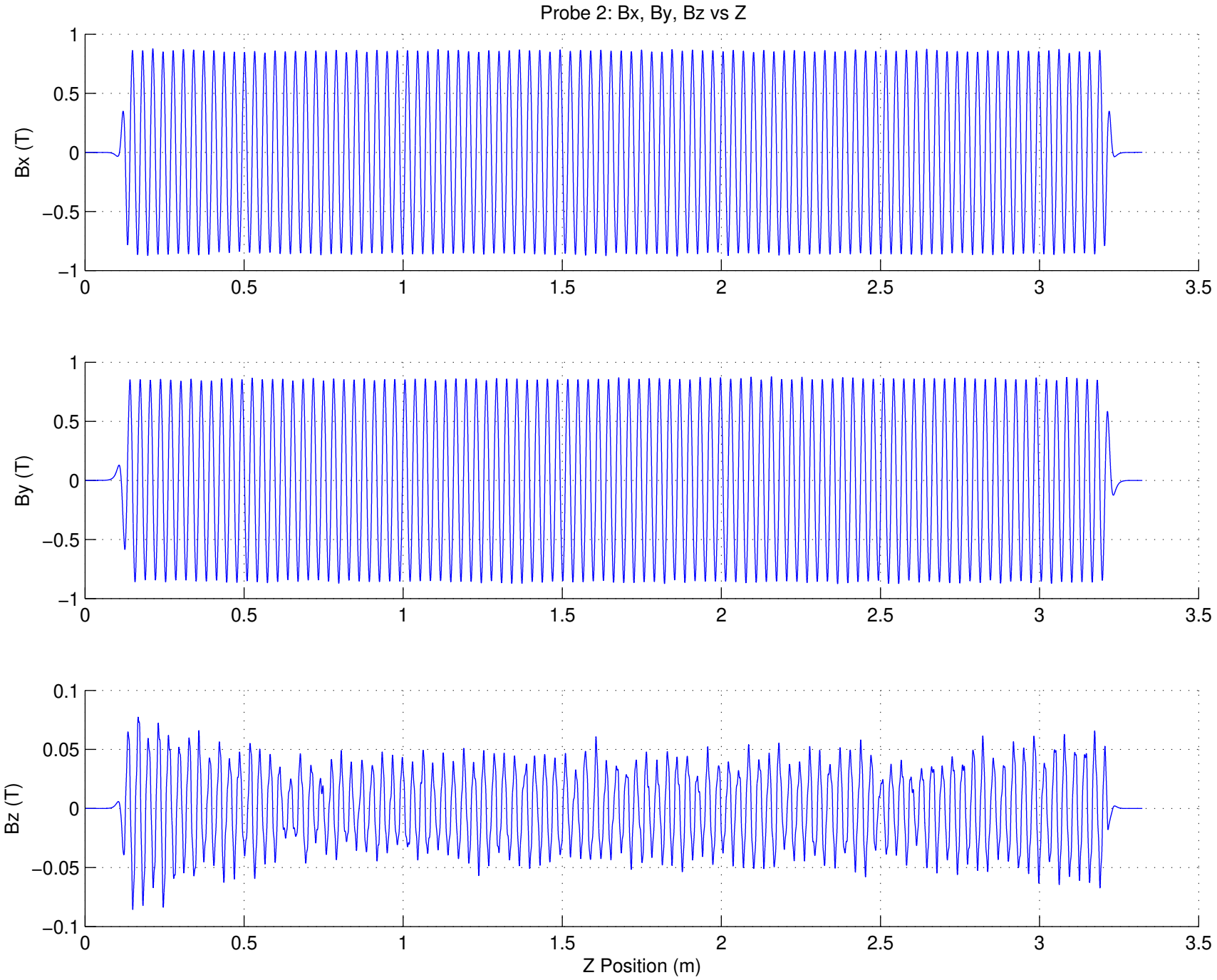
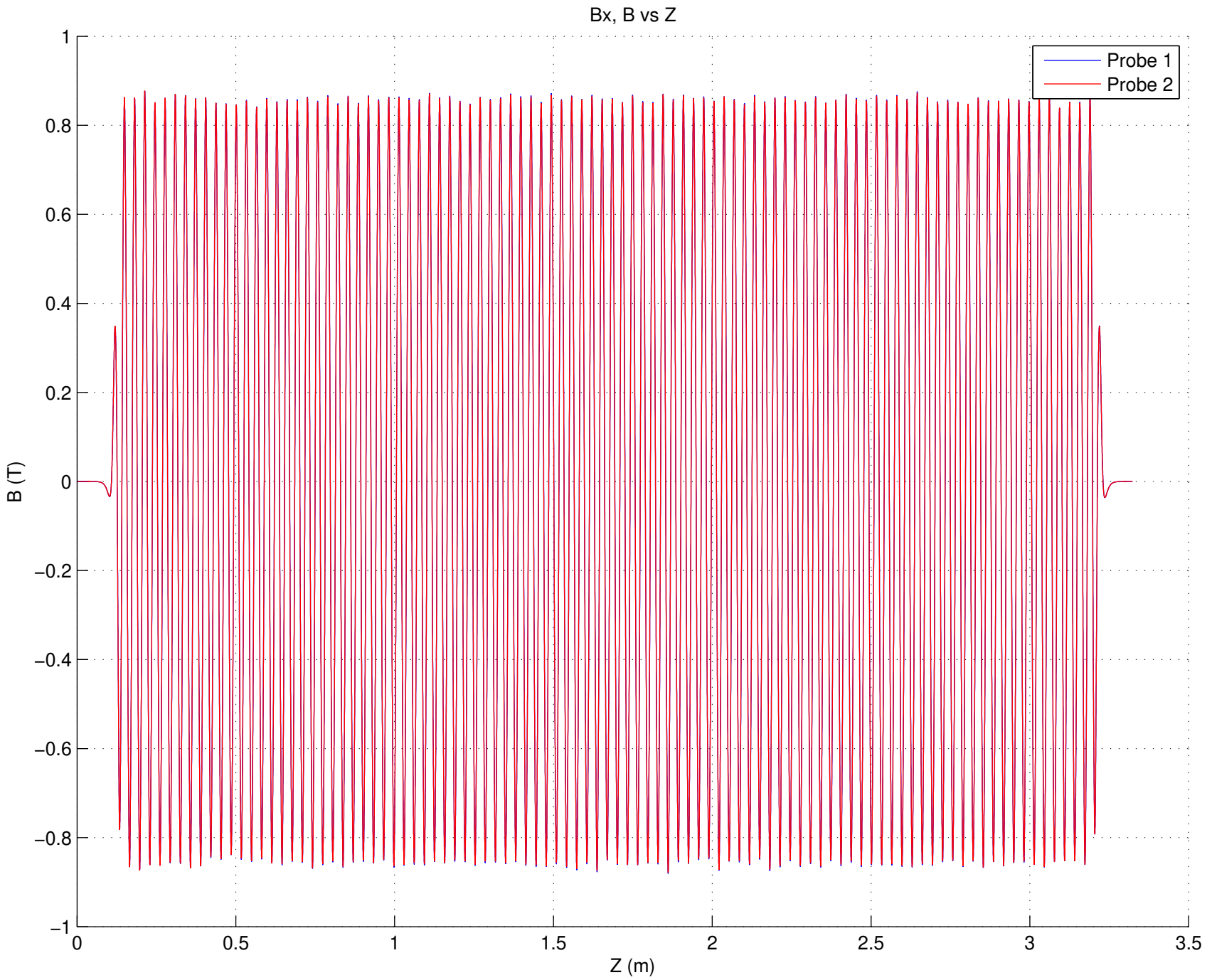
SLAC Magnetic Measurements

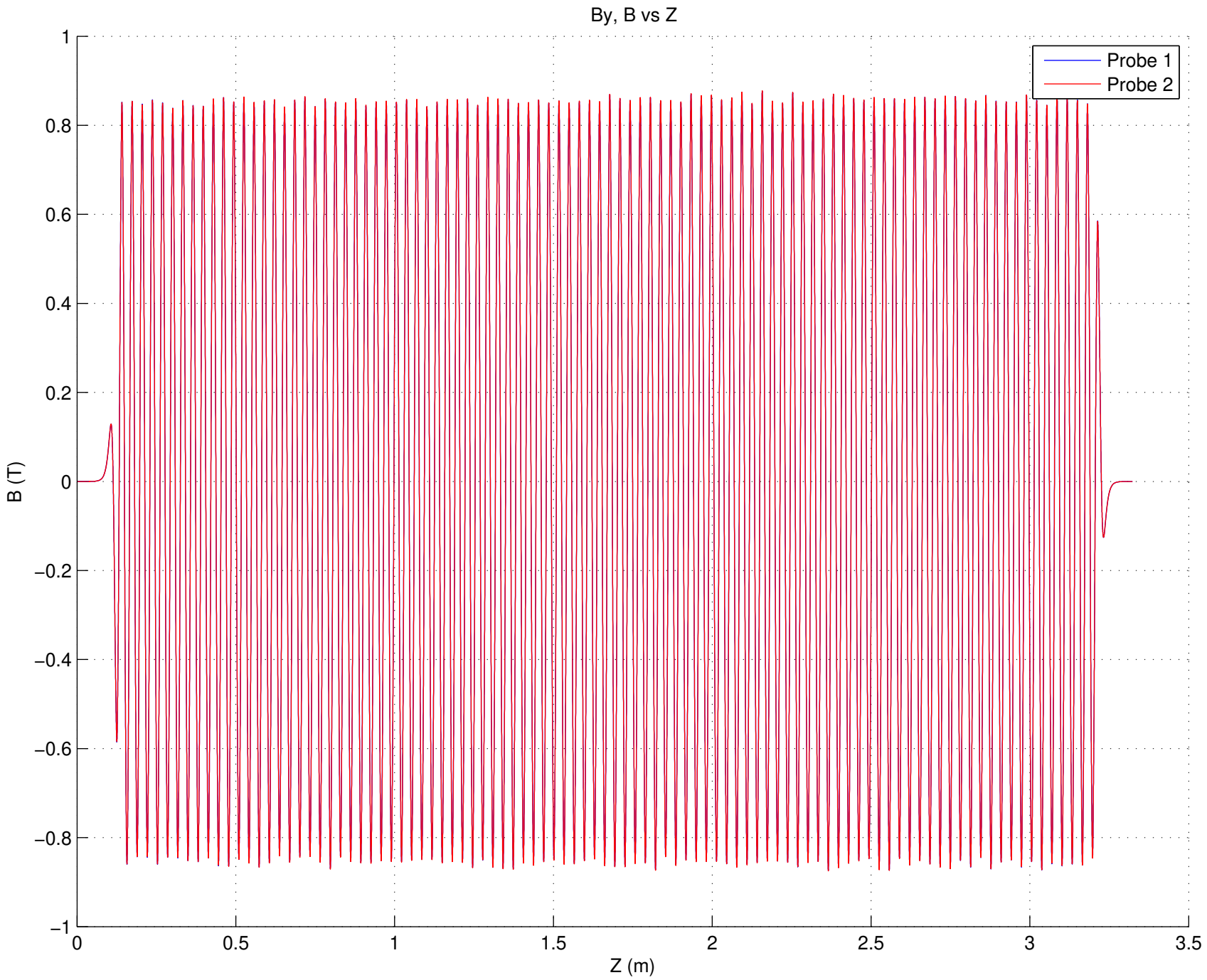
Hall Probe Array Analysis
****

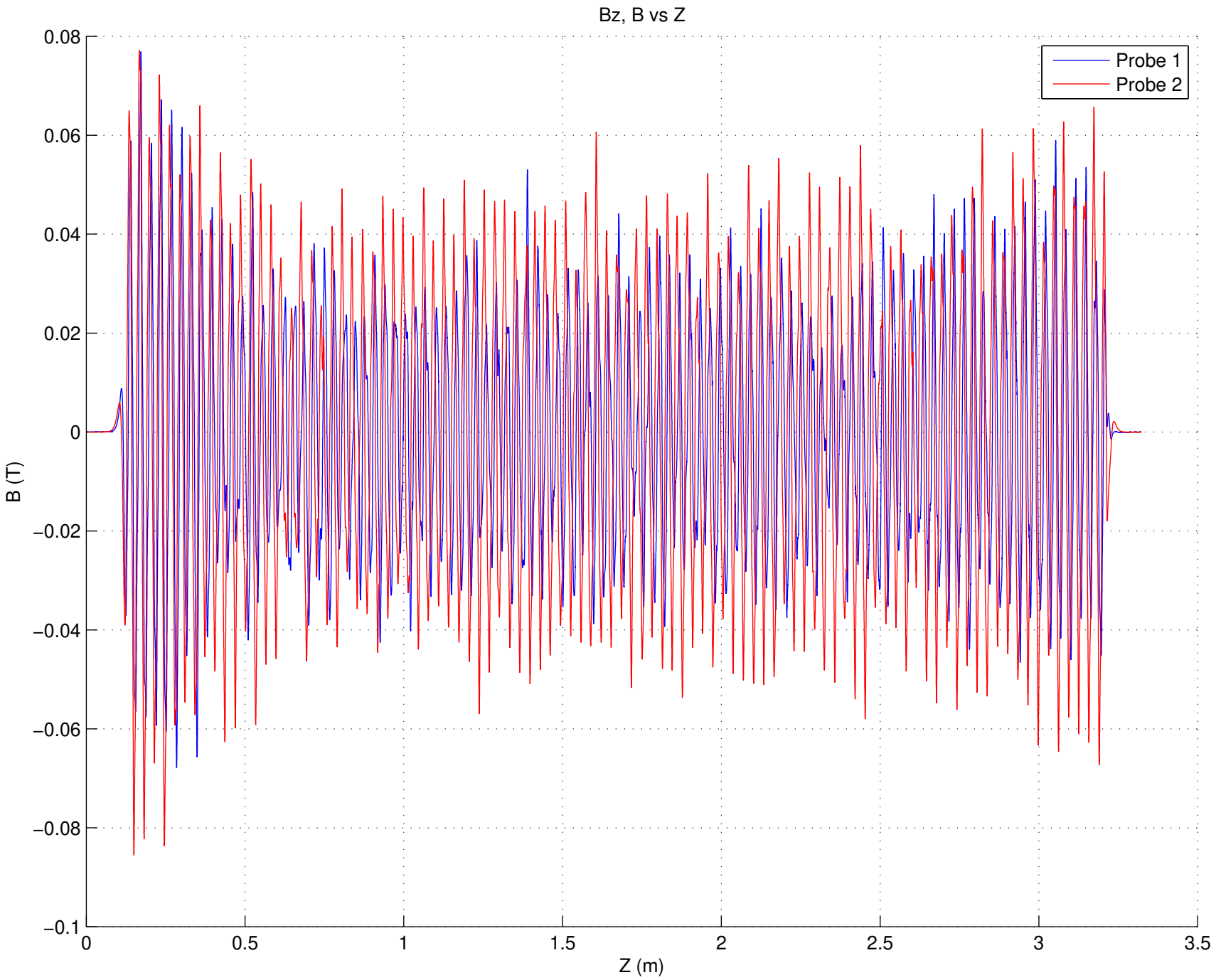
Parameters:
INPUT−FILE−DIR =V:\MET\MagServe\MagData\DELTA\Delta data\Assembled Measurements\Final Measurements\CPLMF\KR1
INPUT−FILE−NAME =DUTestOutput.dat
INPUT−FILE−TYPE =ZVXYZVXYZH
UND−POL−MODE =CIRC−POL−LEFT−HAND
PROBE1−BX−CALIB−FILE =v:\MET\MagServe\MagData\LCLS\Hall probe\SENIS−119−12\SENIS−119−12−X.ini
PROBE1−BY−CALIB−FILE =v:\MET\MagServe\MagData\LCLS\Hall probe\SENIS−119−12\SENIS−119−12−Y.ini
PROBE2−BX−CALIB−FILE =v:\MET\MagServe\MagData\LCLS\Hall probe\SENIS−120−12\SENIS−120−12−X.ini
PROBE2−BY−CALIB−FILE =v:\MET\MagServe\MagData\LCLS\Hall probe\SENIS−120−12\SENIS−120−12−Y.ini
NUM−ZERO−GAUSS−MEAS =200
PROBE2−OFFSET−DIR =Y

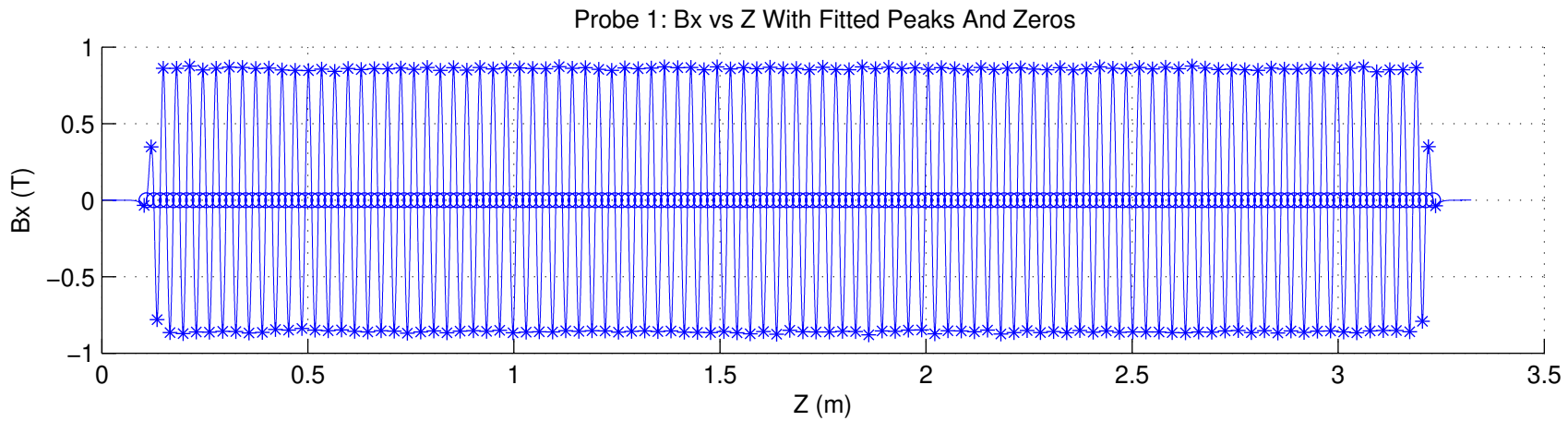

Probe 1: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
Z Position (m)
1
0.5
0
−0.5
−1
0.1
0.05
−0.05
−0.1
0
0.5
1
1.5
2
2.5
3
3.5

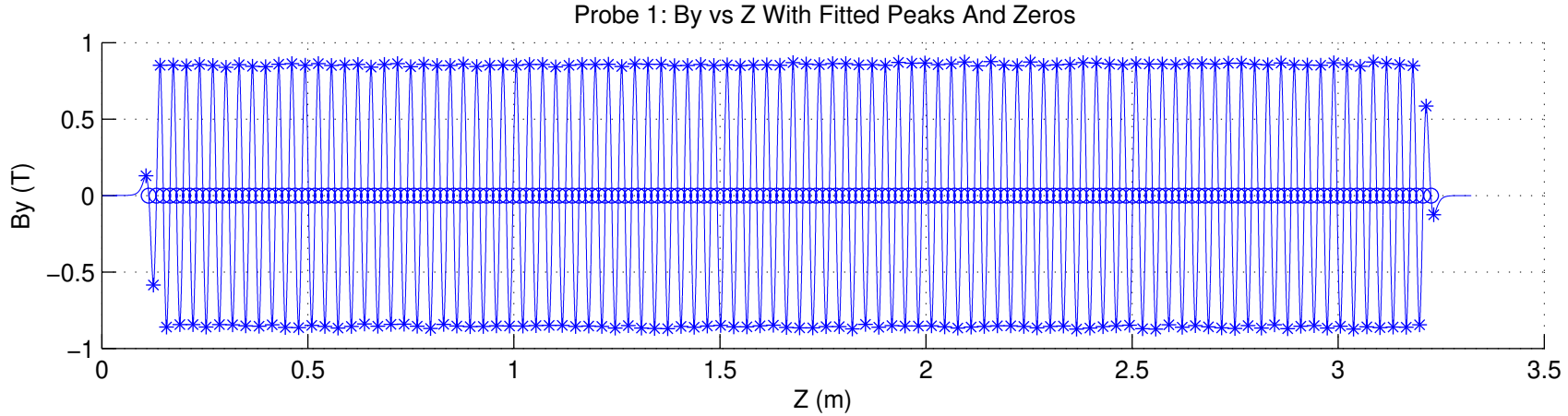

Probe 2: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
Z Position (m)
1
0.5
0
−0.5
−1
0.1
0.05
−0.05
−0.1
0
0.5
1
1.5
2
2.5
3
3.5

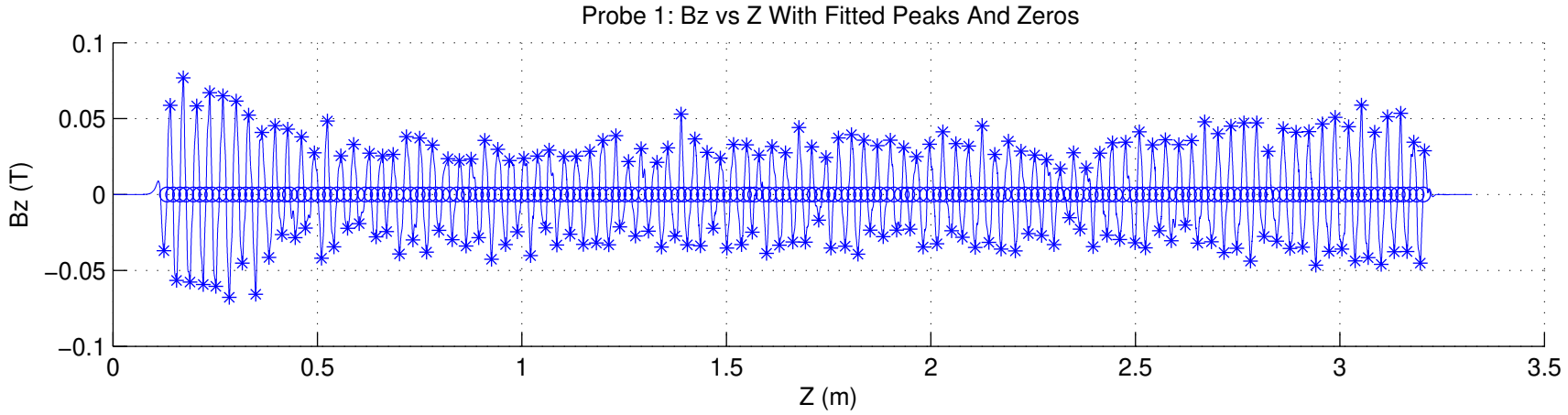

Bx, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
0
0.5
1
1.5
2
2.5
3
3.5

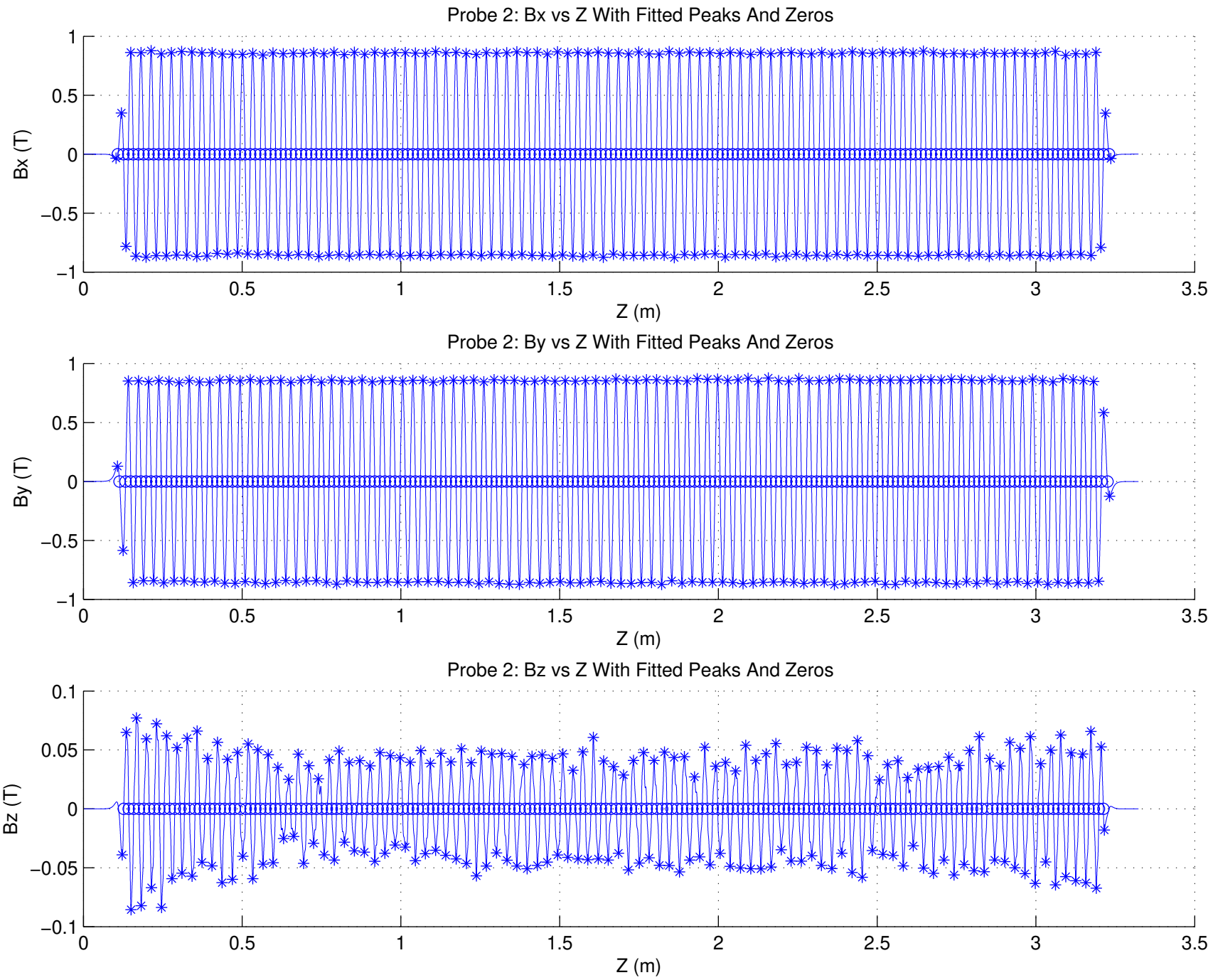

By, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
0
0.5
1
1.5
2
2.5
3
3.5

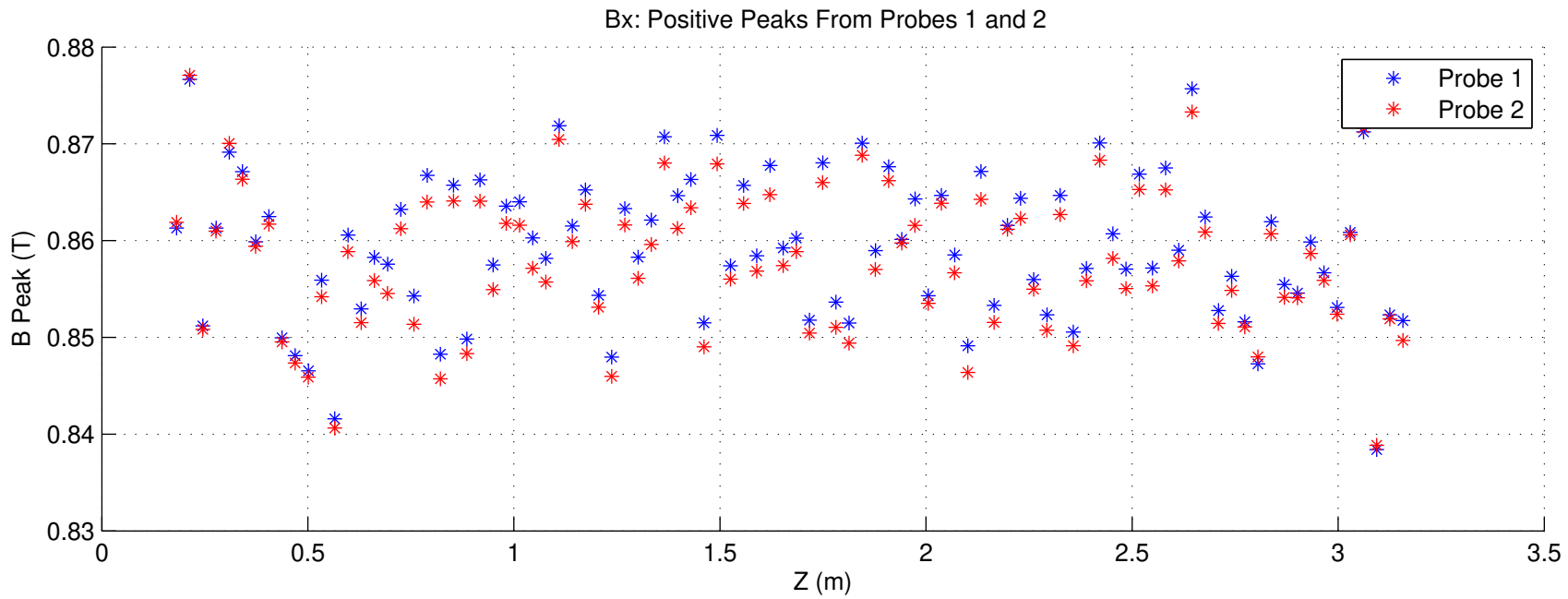

Bz, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
0.08
0.06
0.04
0.02
0
−0.02
−0.04
−0.06
−0.08
−0.1
0
0.5
1
1.5
2
2.5
3
3.5

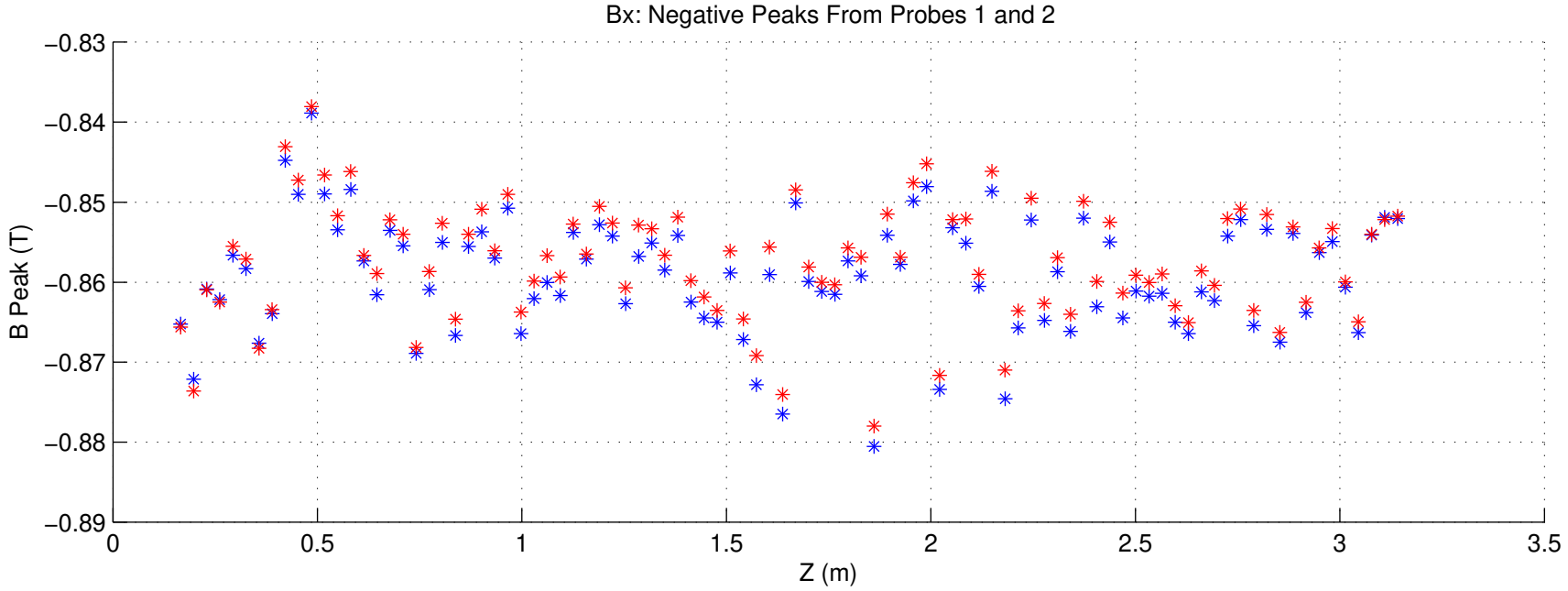

Probe 1: Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
1
0.5
0
−0.5
−1
0
0.5
1
1.5
2
2.5
3
3.5

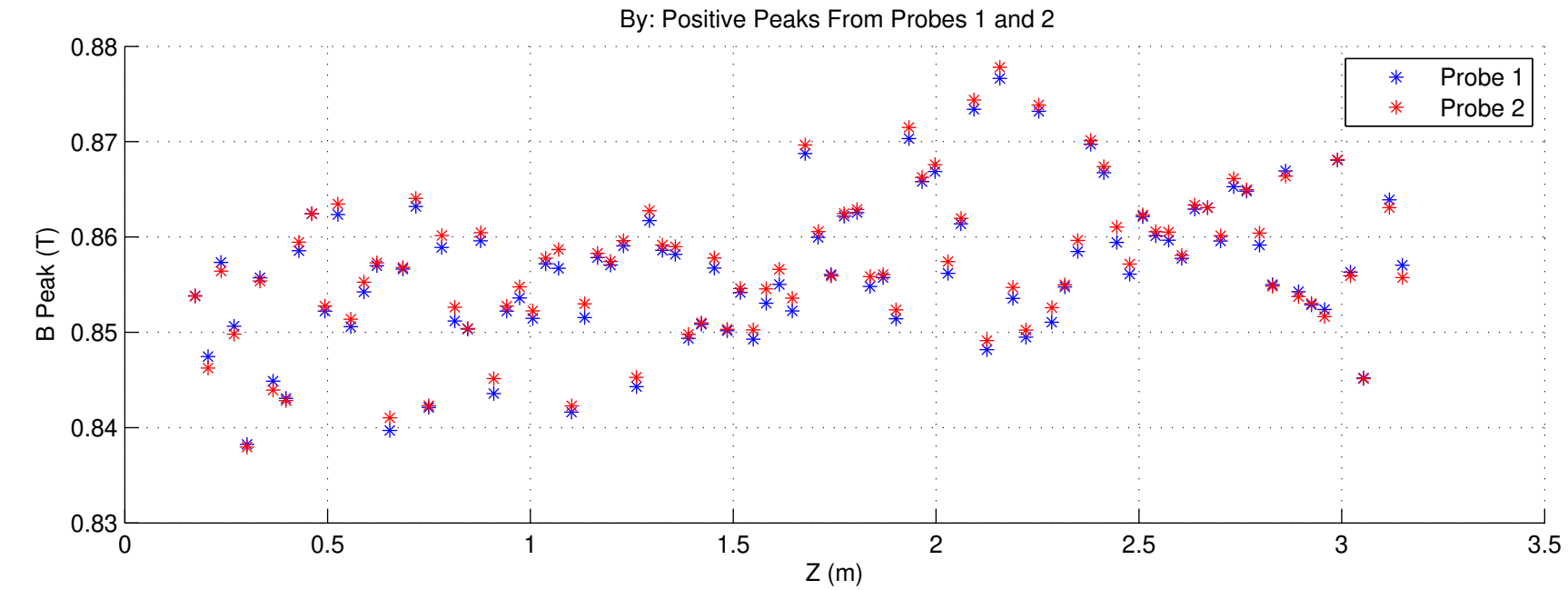

Probe 1: By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
1
0.5
0
−0.5
−1
0
0.5
1
1.5
2
2.5
3
3.5

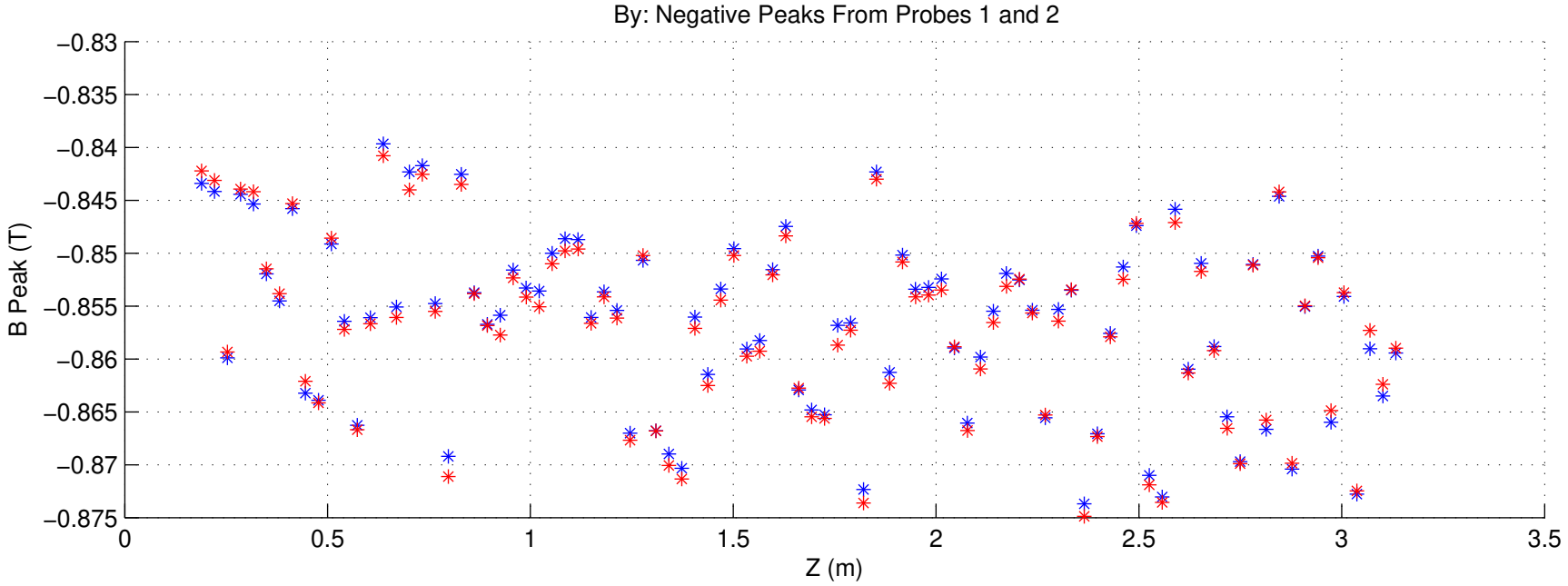

Probe 1: Bz vs Z With Fitted Peaks And Zeros
Bz (T)
Z (m)
0.1
0.05
0
−0.05
−0.1
0
0.5
1
1.5
2
2.5
3
3.5

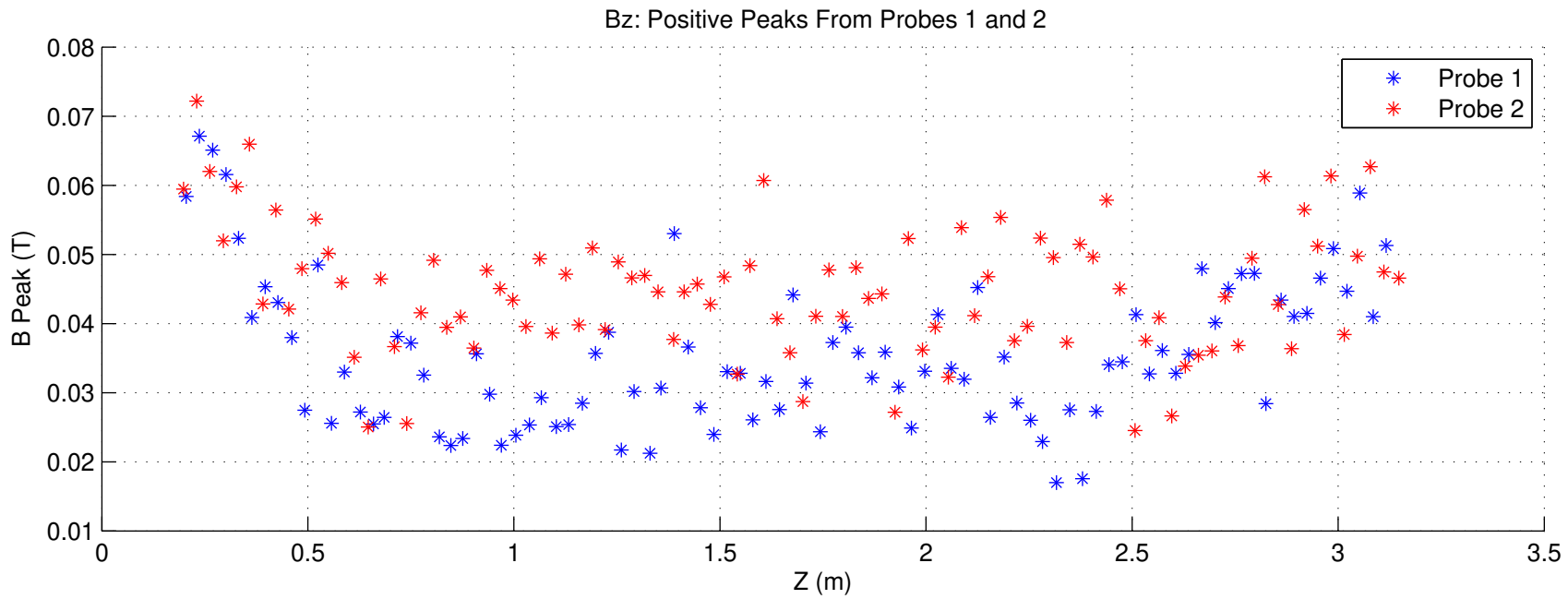

Probe 2: Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
Probe 2: By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
Probe 2: Bz vs Z With Fitted Peaks And Zeros
Bz (T)
Z (m)

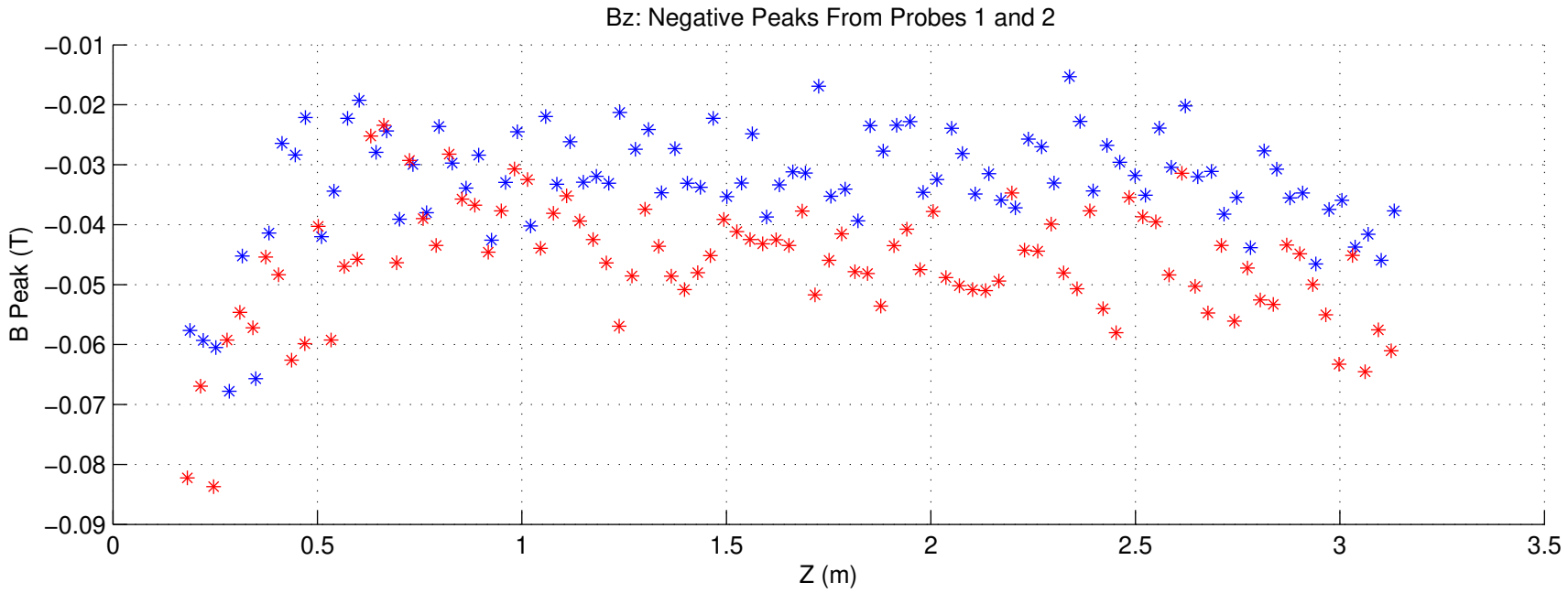

Bx: Positive Peaks From Probes 1 and 2
Probe 1
Probe 2
B Peak (T)
Z (m)
0.88
0.87
0.86
0.85
0.84
0.83
0
0.5
1
1.5
2
2.5
3
3.5

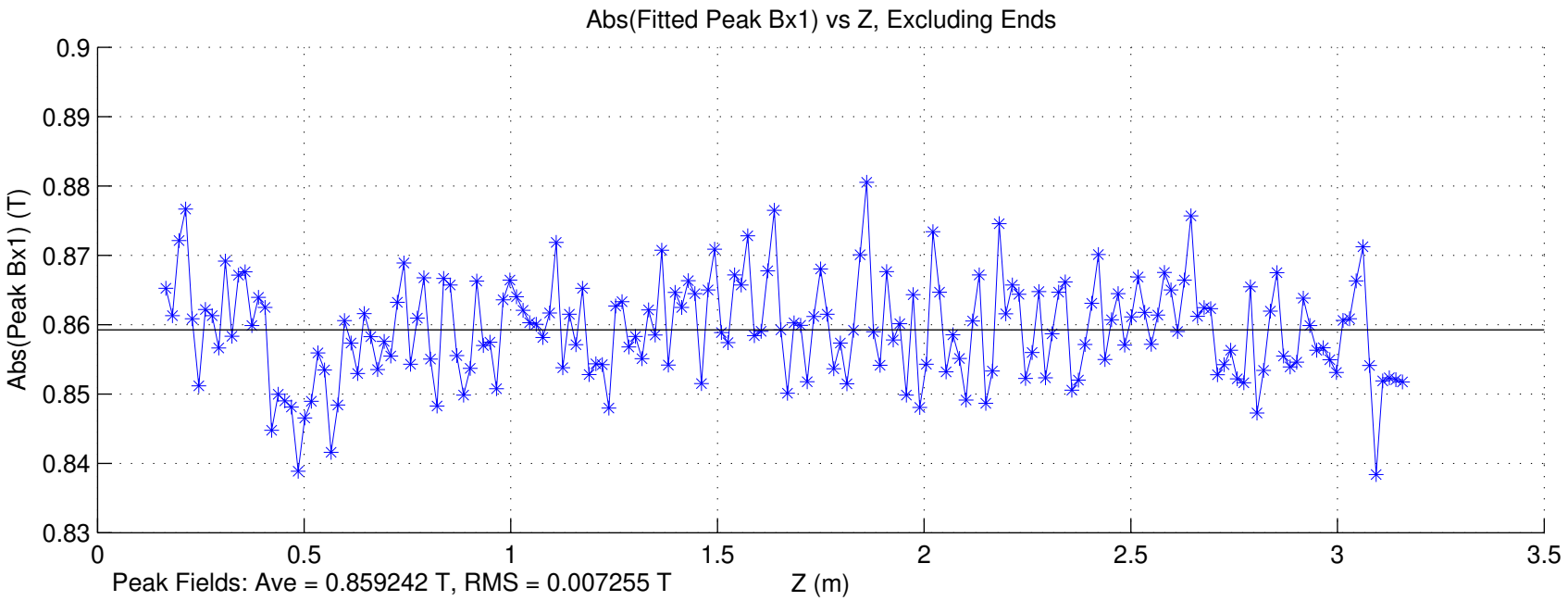

Bx: Negative Peaks From Probes 1 and 2
B Peak (T)
Z (m)
−0.83
−0.84
−0.85
−0.86
−0.87
−0.88
−0.89
0
0.5
1
1.5
2
2.5
3
3.5

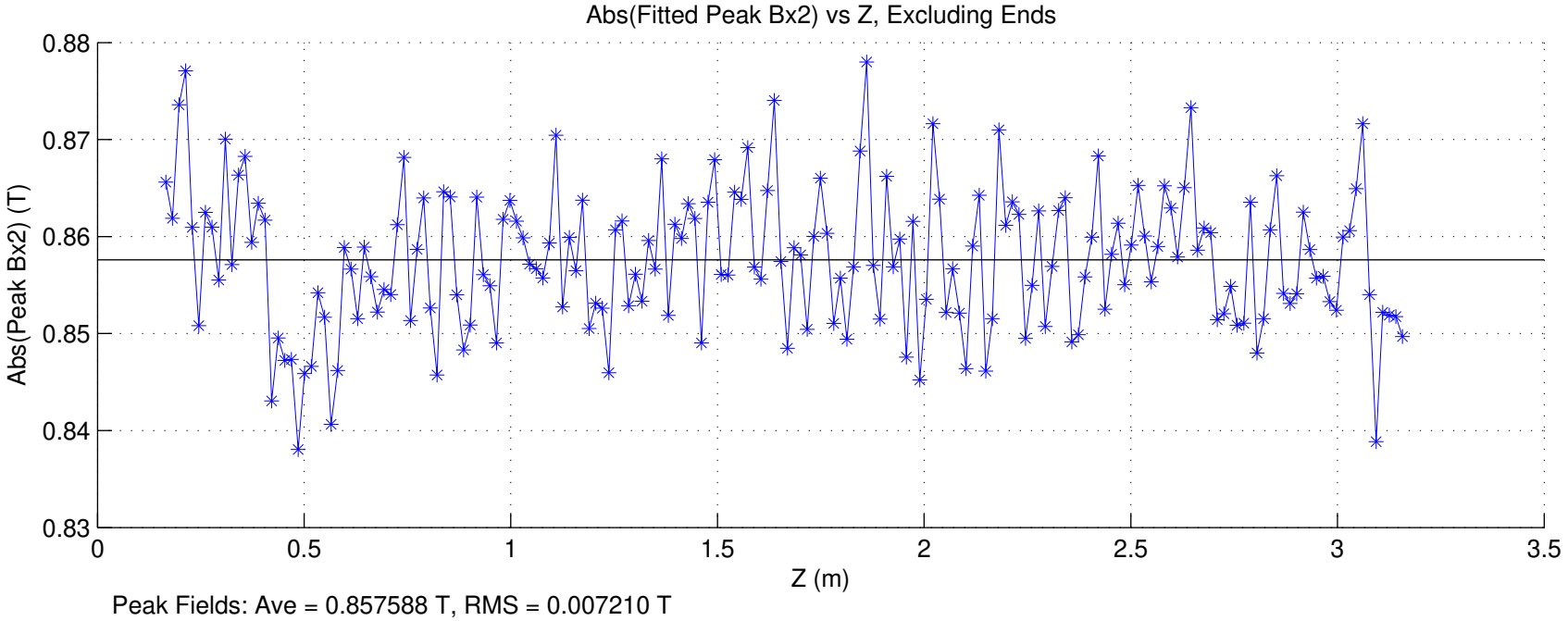

By: Positive Peaks From Probes 1 and 2
Probe 1
Probe 2
B Peak (T)
Z (m)
0.88
0.87
0.86
0.85
0.84
0.83
0
0.5
1
1.5
2
2.5
3
3.5

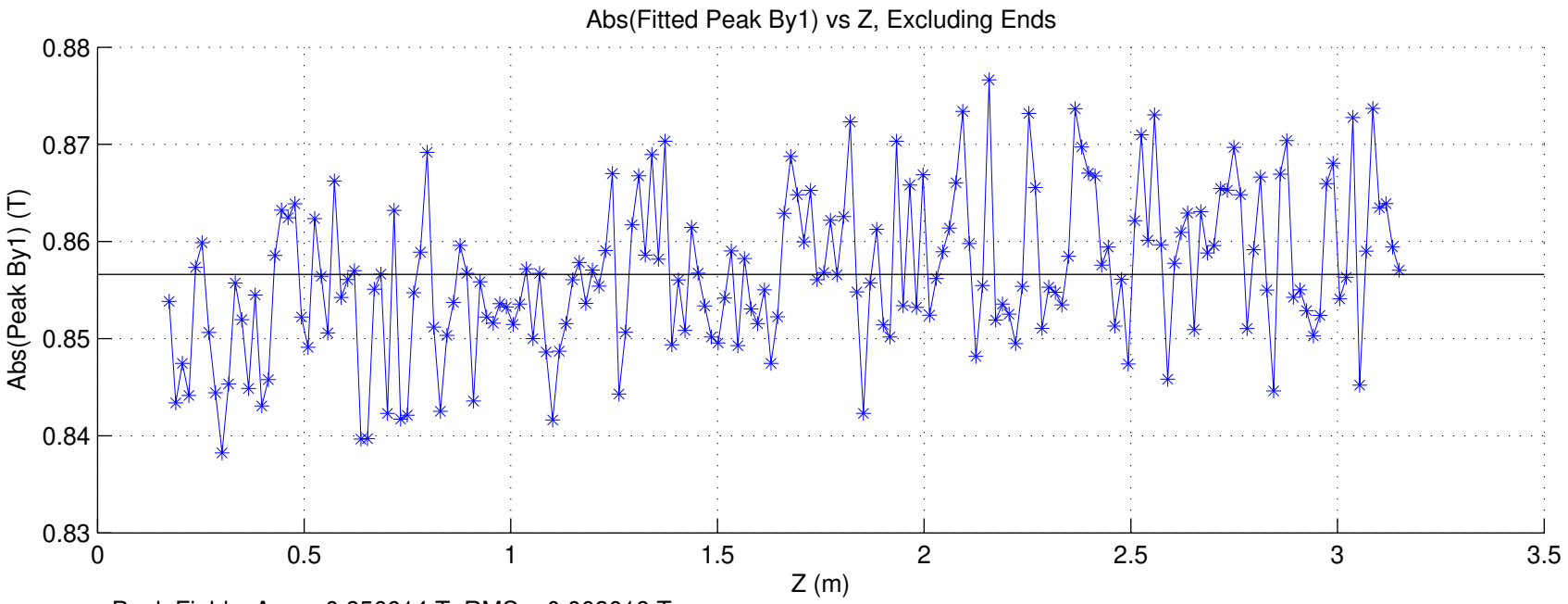

By: Negative Peaks From Probes 1 and 2
B Peak (T)
Z (m)
−0.83
−0.835
−0.84
−0.845
−0.85
−0.855
−0.86
−0.865
−0.87
−0.875
0
0.5
1
1.5
2
2.5
3
3.5


Bz: Positive Peaks From Probes 1 and 2
Probe 1
Probe 2
B Peak (T)
Z (m)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0.5
1
1.5
2
2.5
3
3.5

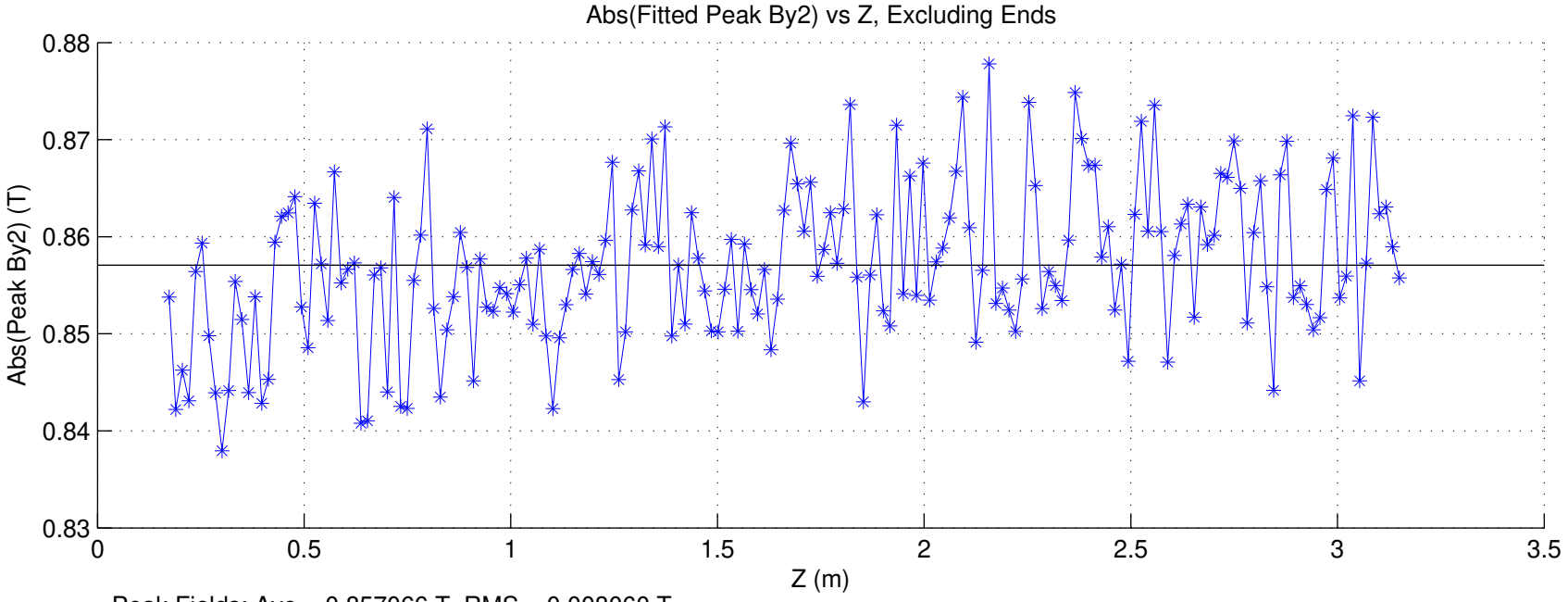

Bz: Negative Peaks From Probes 1 and 2
B Peak (T)
Z (m)
−0.01
−0.02
−0.03
−0.04
−0.05
−0.06
−0.07
−0.08
−0.09
0
0.5
1
1.5
2
2.5
3
3.5


Abs(Fitted Peak Bx1) vs Z, Excluding Ends
Abs(Peak Bx1) (T)
0.9
0.89
0.88
0.87
0.86
0.85
0.84
0.83
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)
Peak Fields: Ave = 0.859242 T, RMS = 0.007255 T

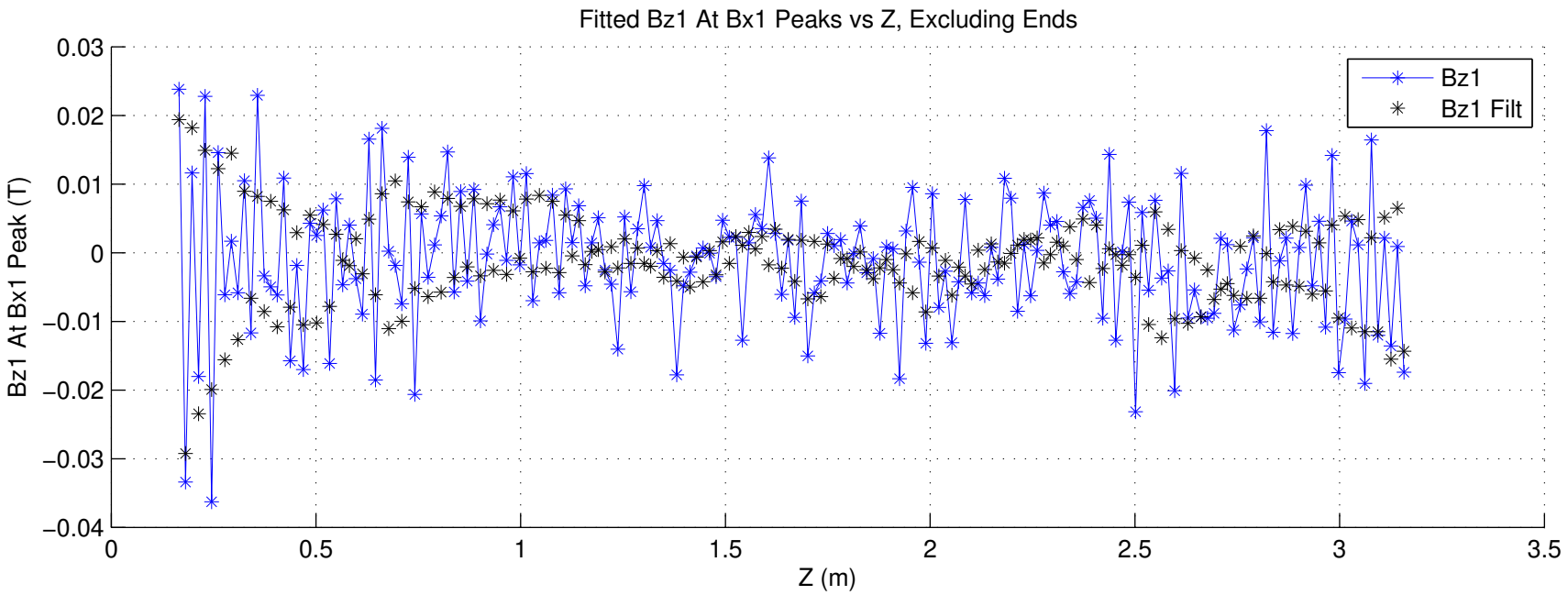

Abs(Fitted Peak Bx2) vs Z, Excluding Ends
Abs(Peak Bx2) (T)
0.88
0.87
0.86
0.85
0.84
0.83
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)
Peak Fields: Ave = 0.857588 T, RMS = 0.007210 T

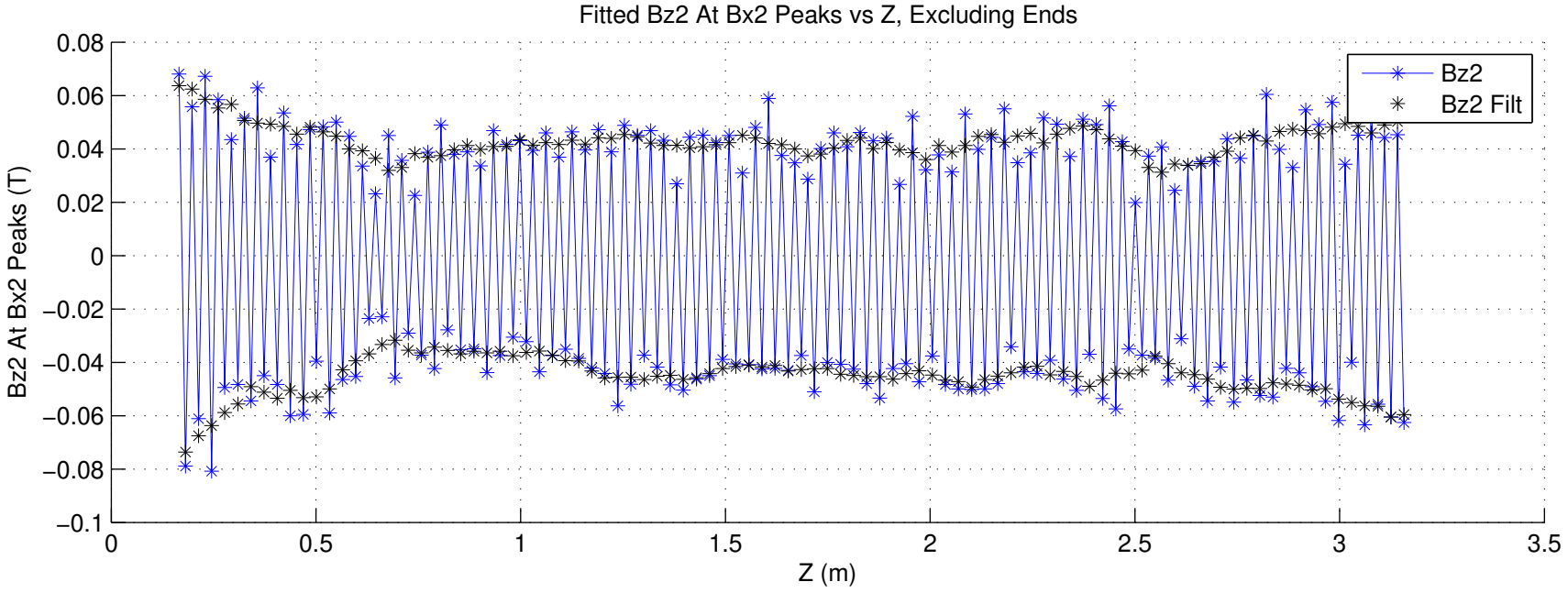


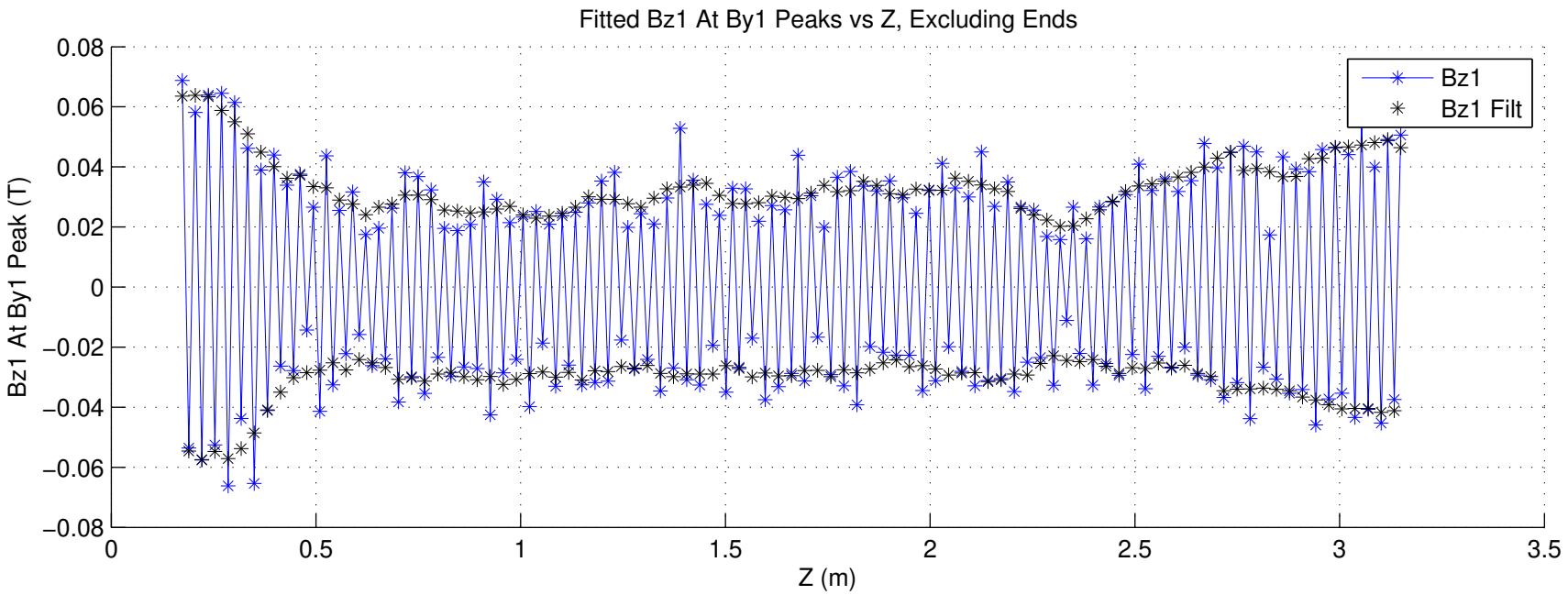
Peak Fields: Ave = 0.856614 T, RMS = 0.008019 T

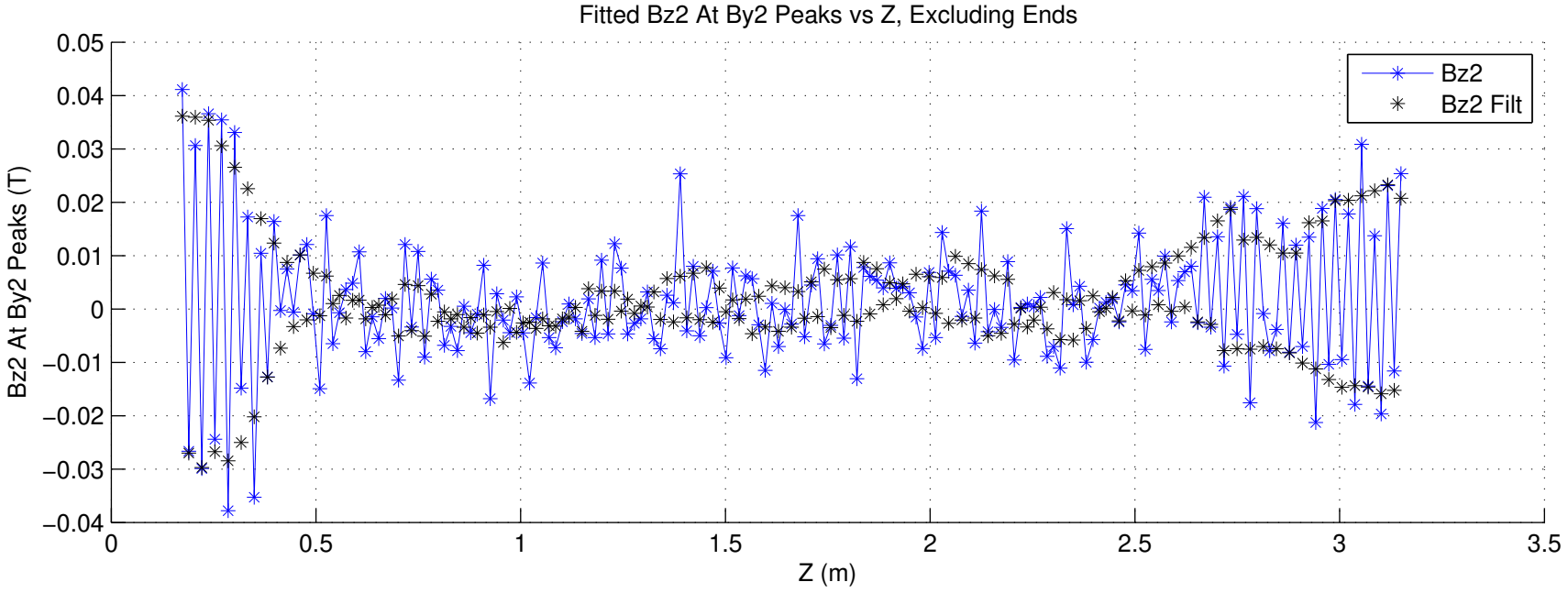


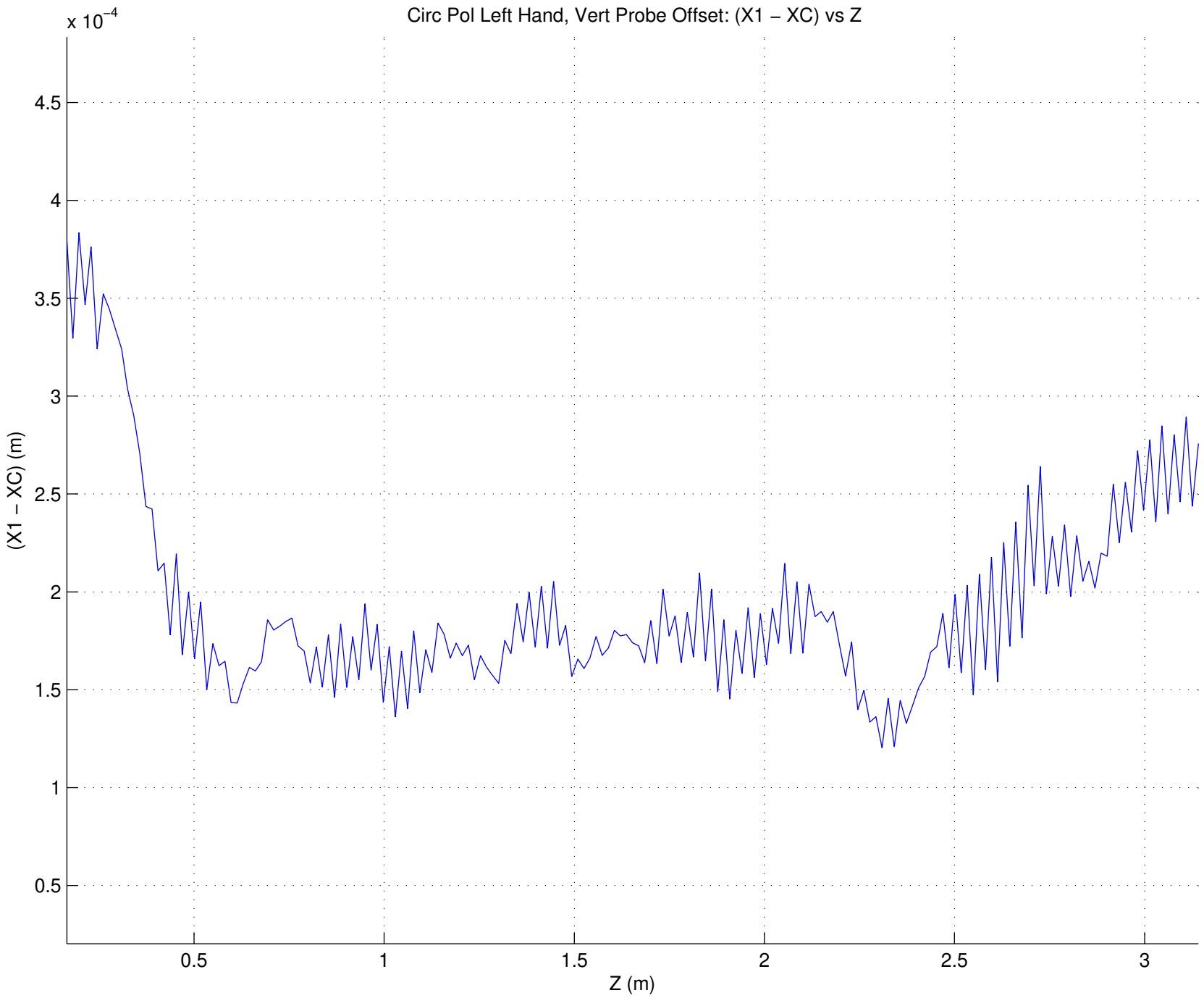
Peak Fields: Ave = 0.857066 T, RMS = 0.008060 T

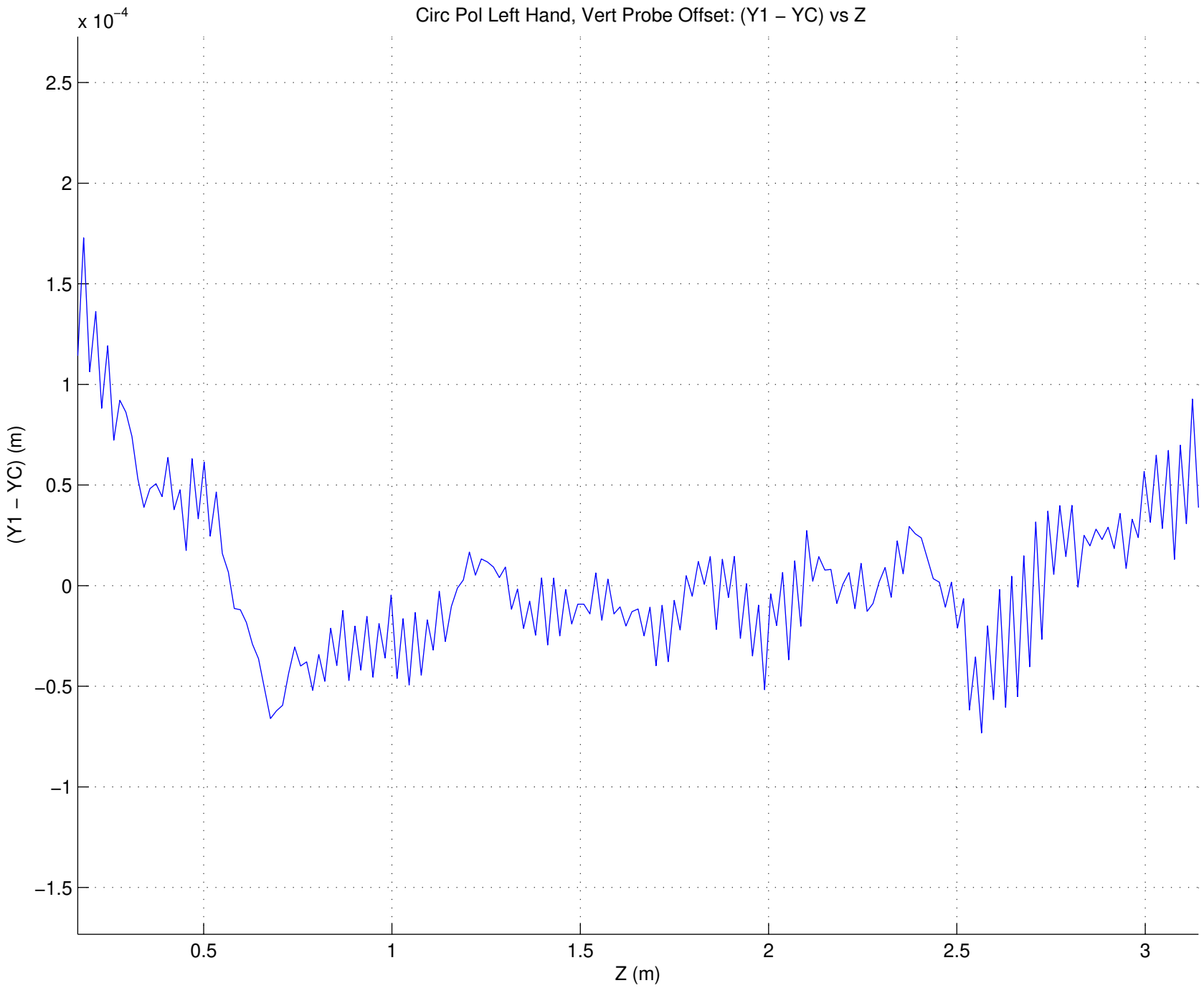

Fitted Bz1 At Bx1 Peaks vs Z, Excluding Ends
Bz1 At Bx1 Peak (T)
Z (m)
Bz1
Bz1 Filt
0.03
0.02
0.01
0
−0.01
−0.02
−0.03
−0.04
0
0.5
1
1.5
2
2.5
3
3.5

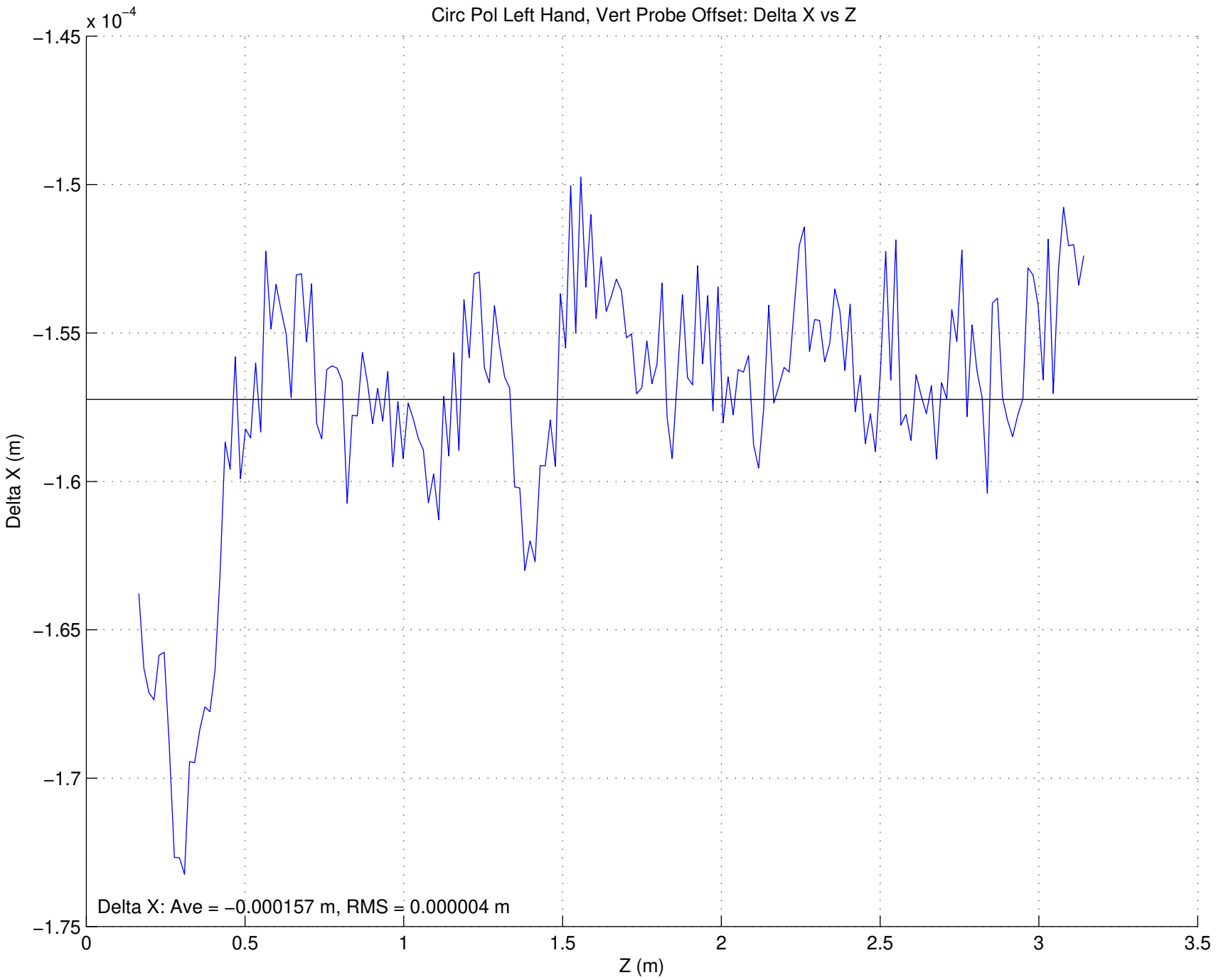

Fitted Bz2 At Bx2 Peaks vs Z, Excluding Ends
Bz2 At Bx2 Peaks (T)
Z (m)
Bz2
Bz2 Filt
0.08
0.06
0.04
0.02
0
−0.02
−0.04
−0.06
−0.08
−0.1
0
0.5
1
1.5
2
2.5
3
3.5

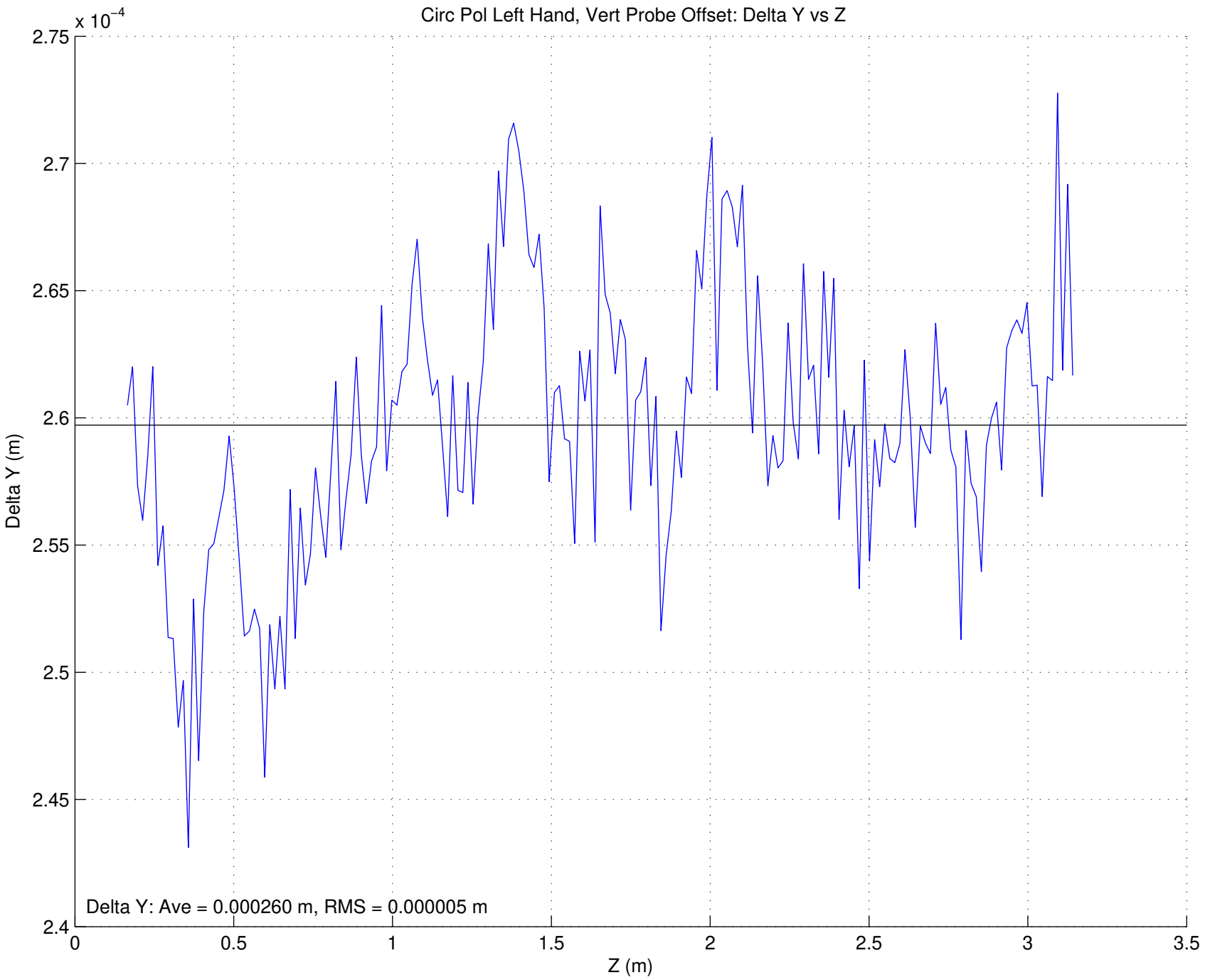

Fitted Bz1 At By1 Peaks vs Z, Excluding Ends
Bz1
Bz1 Filt
Bz1 At By1 Peak (T)
Z (m)
0.08
0.06
0.04
0.02
0
−0.02
−0.04
−0.06
−0.08
0
0.5
1
1.5
2
2.5
3
3.5

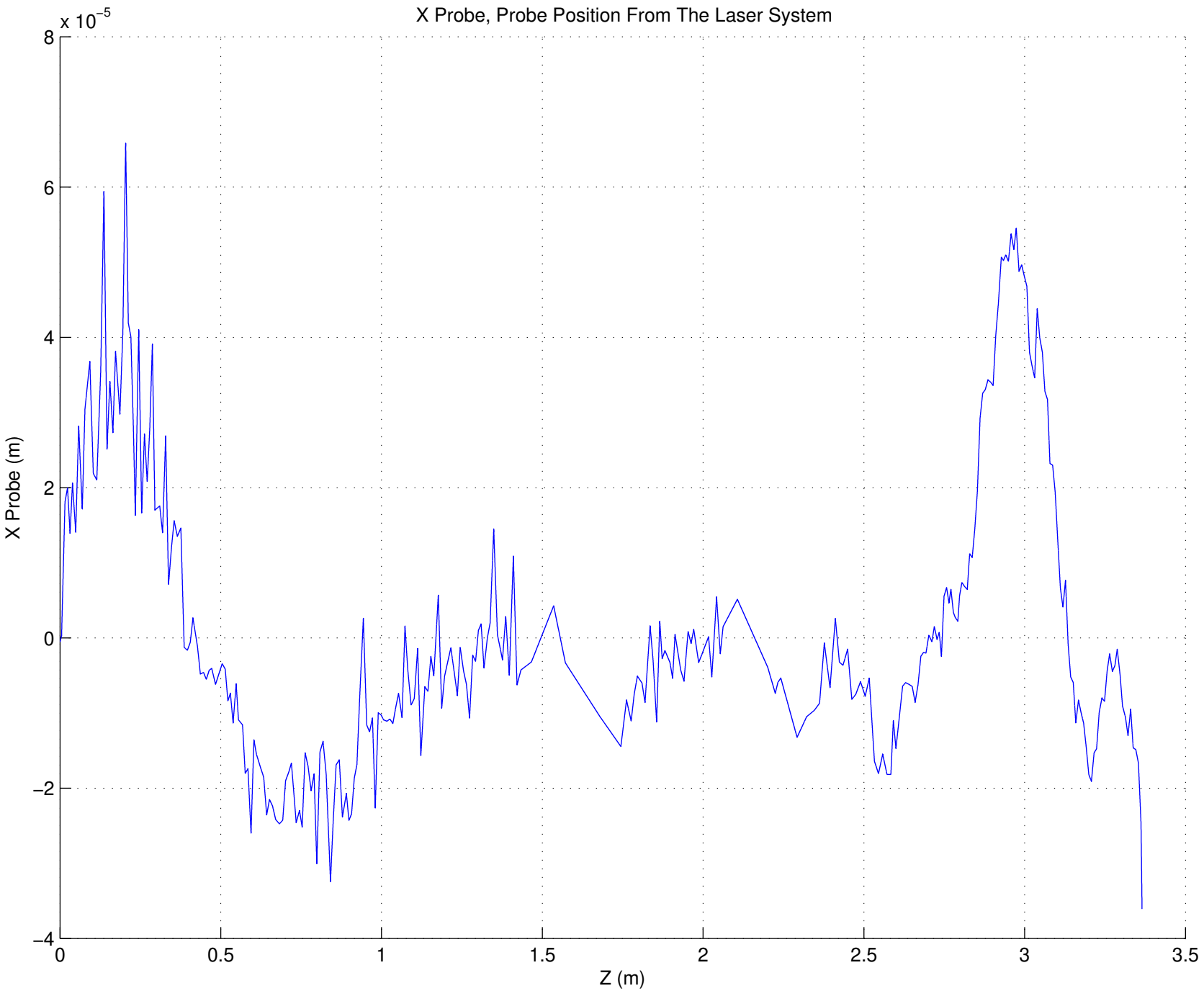

Fitted Bz2 At By2 Peaks vs Z, Excluding Ends
Bz2
Bz2 Filt
Bz2 At By2 Peaks (T)
Z (m)
0.05
0.04
0.03
0.02
0.01
0
−0.01
−0.02
−0.03
−0.04
0
0.5
1
1.5
2
2.5
3
3.5

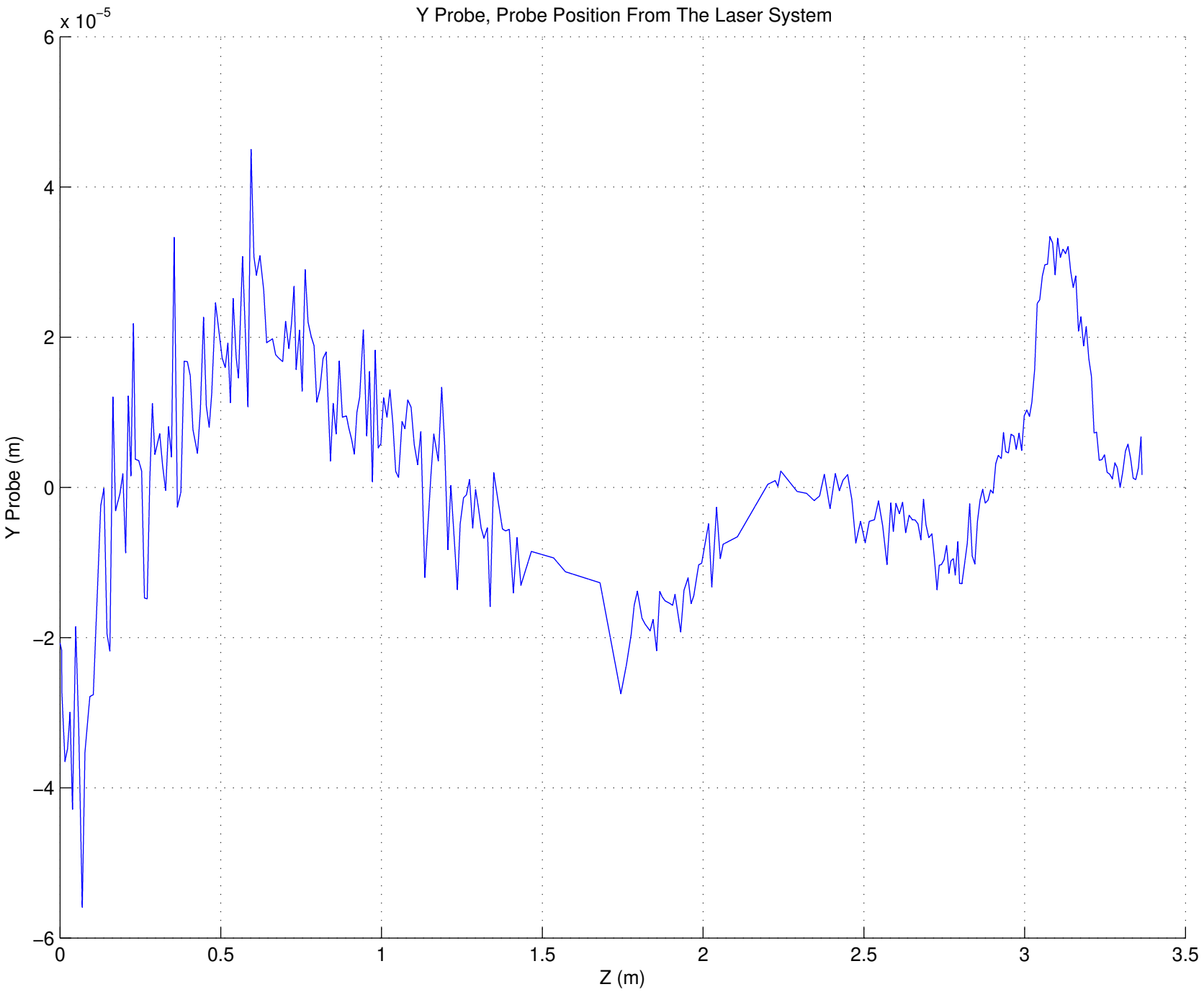

Circ Pol Left Hand, Vert Probe Offset: (X1 – XC) vs Z
x 10^-4
4.5
4
3.5
3
2.5
2
1.5
1
0.5
(X1 – XC) (m)
0.5
1
1.5
2
2.5
3
Z (m)

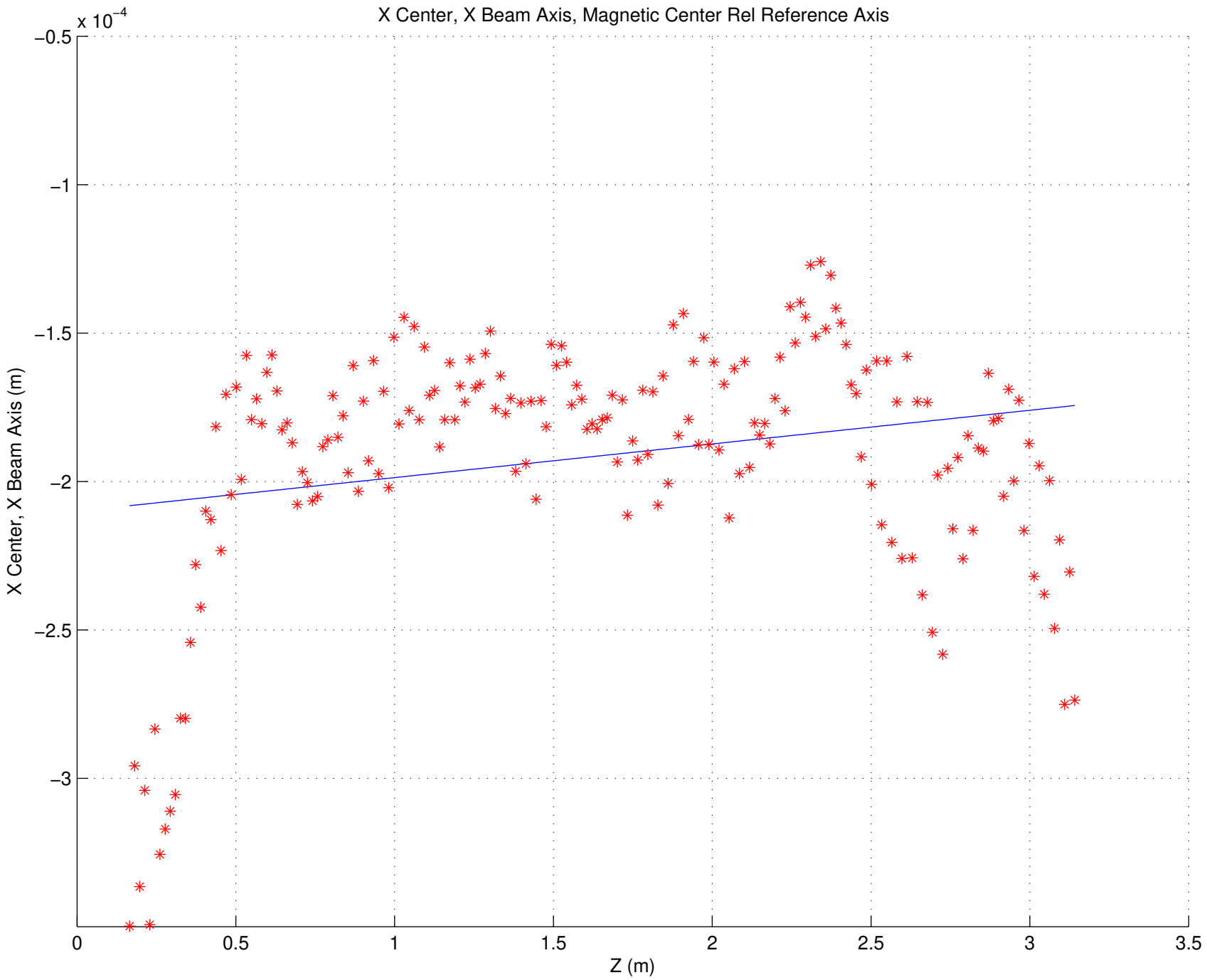

Circ Pol Left Hand, Vert Probe Offset: (Y1 – YC) vs Z
x 10^-4
2.5
2
1.5
1
0.5
0
−0.5
−1
−1.5
(Y1 – YC) (m)
0.5
1
1.5
2
2.5
3
Z (m)

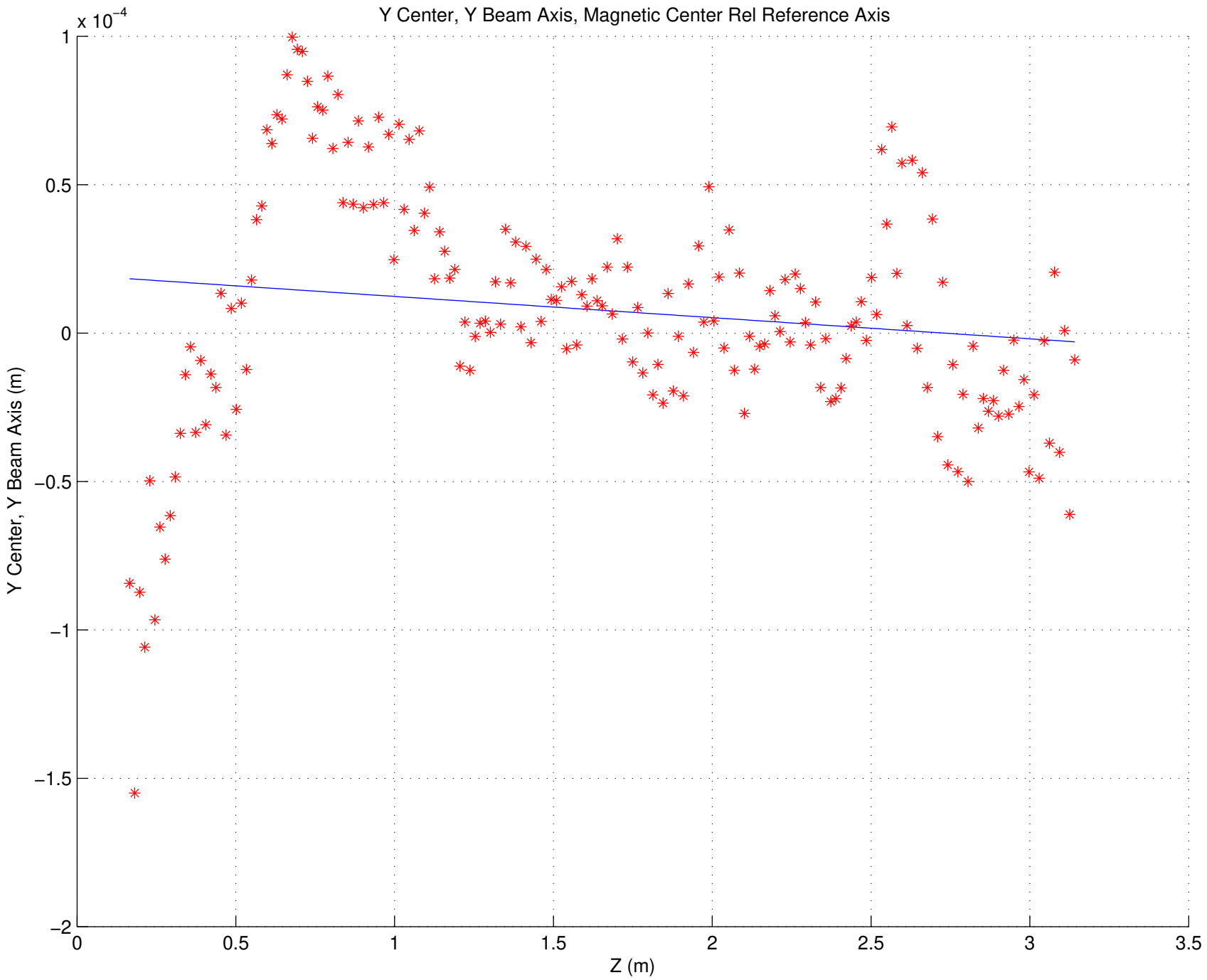

Circ Pol Left Hand, Vert Probe Offset: Delta X vs Z
x 10^-4
−1.45
−1.5
−1.55
−1.6
−1.65
−1.7
−1.75
Delta X (m)
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)
Delta X: Ave = −0.000157 m, RMS = 0.000004 m

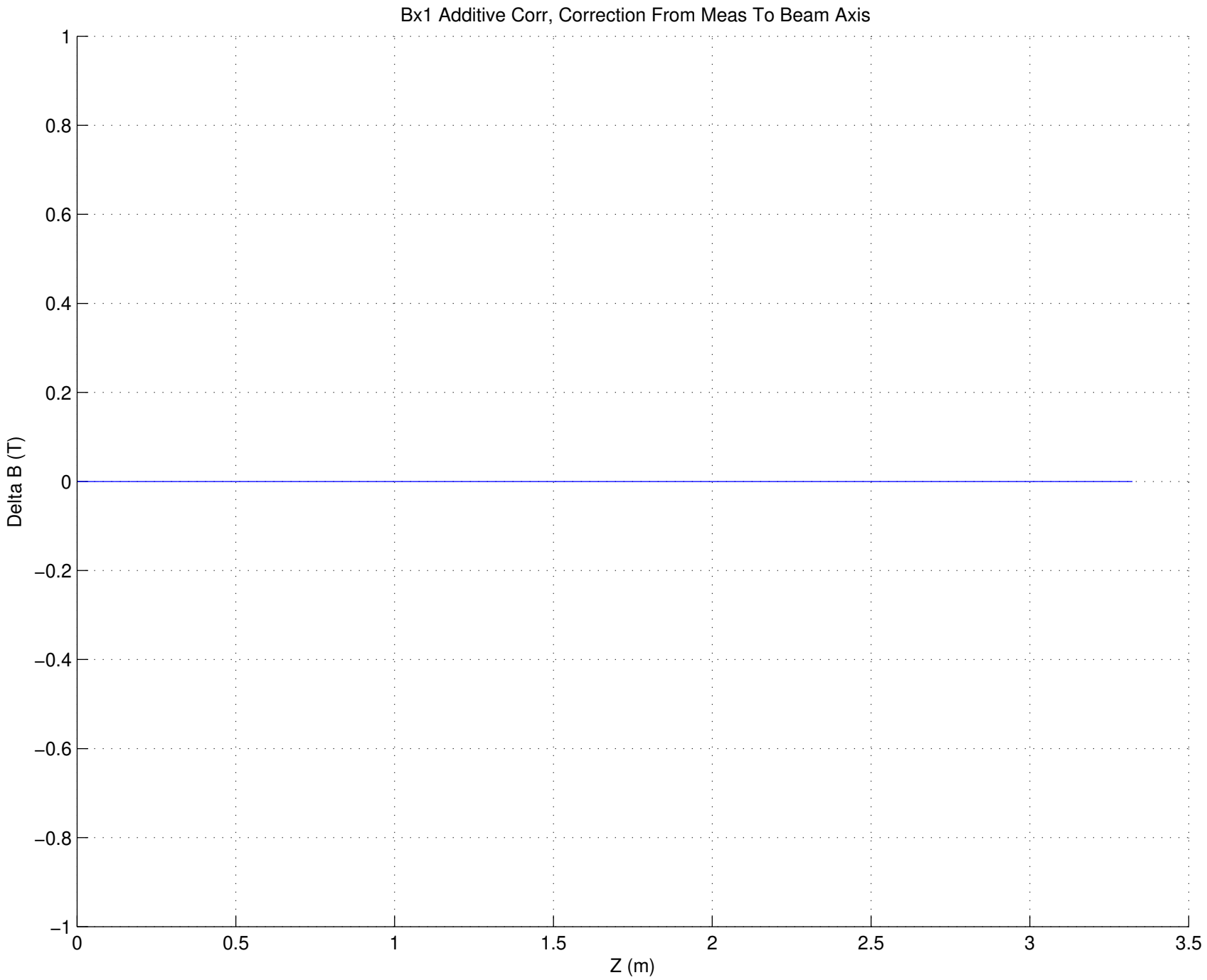

Circ Pol Left Hand, Vert Probe Offset: Delta Y vs Z
x 10^-4
2.75
2.7
2.65
2.6
2.55
2.5
2.45
2.4
Delta Y (m)
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)
Delta Y: Ave = 0.000260 m, RMS = 0.000005 m

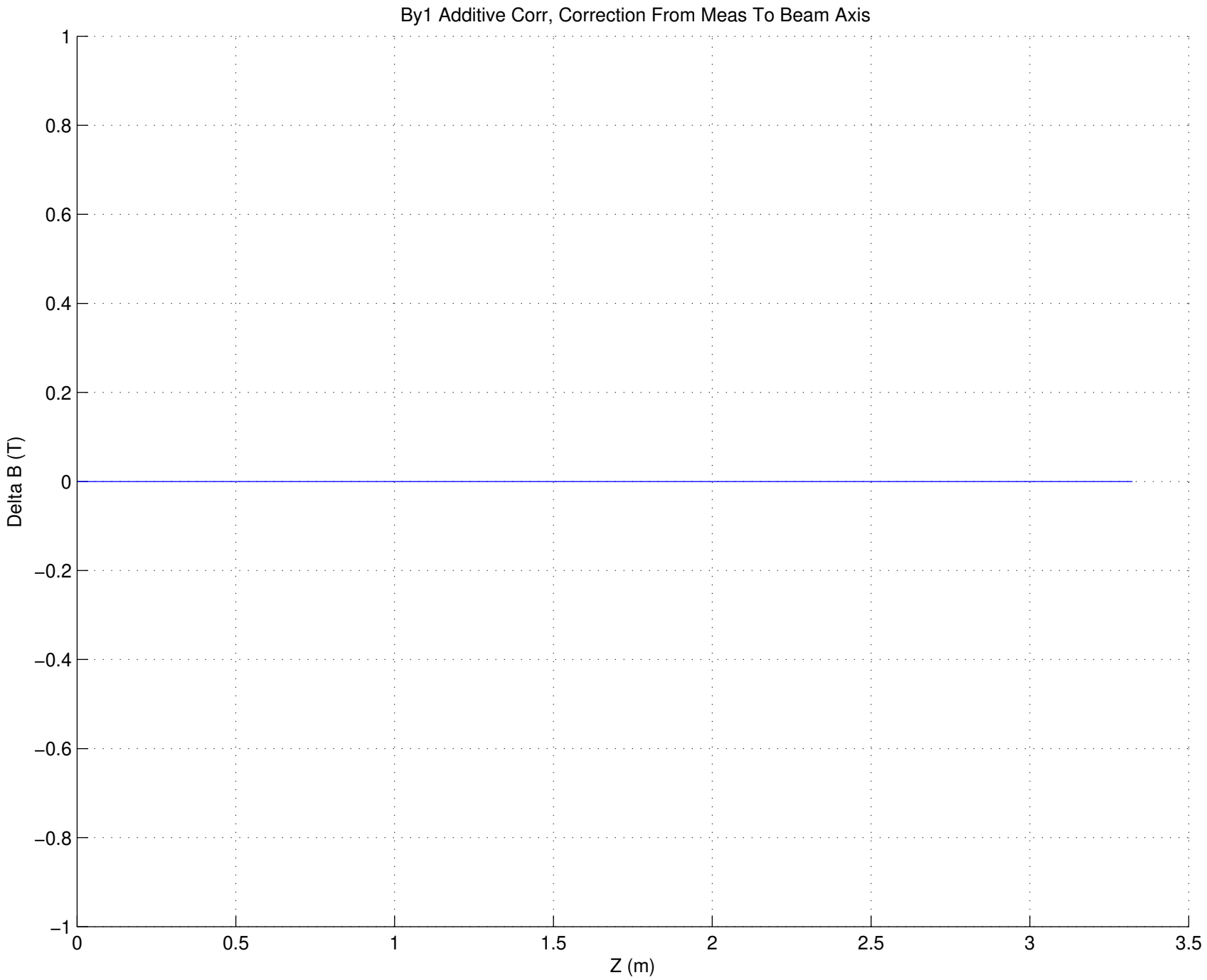

X Probe, Probe Position From The Laser System
x 10^-5
8
6
4
2
0
−2
−4
X Probe (m)
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)

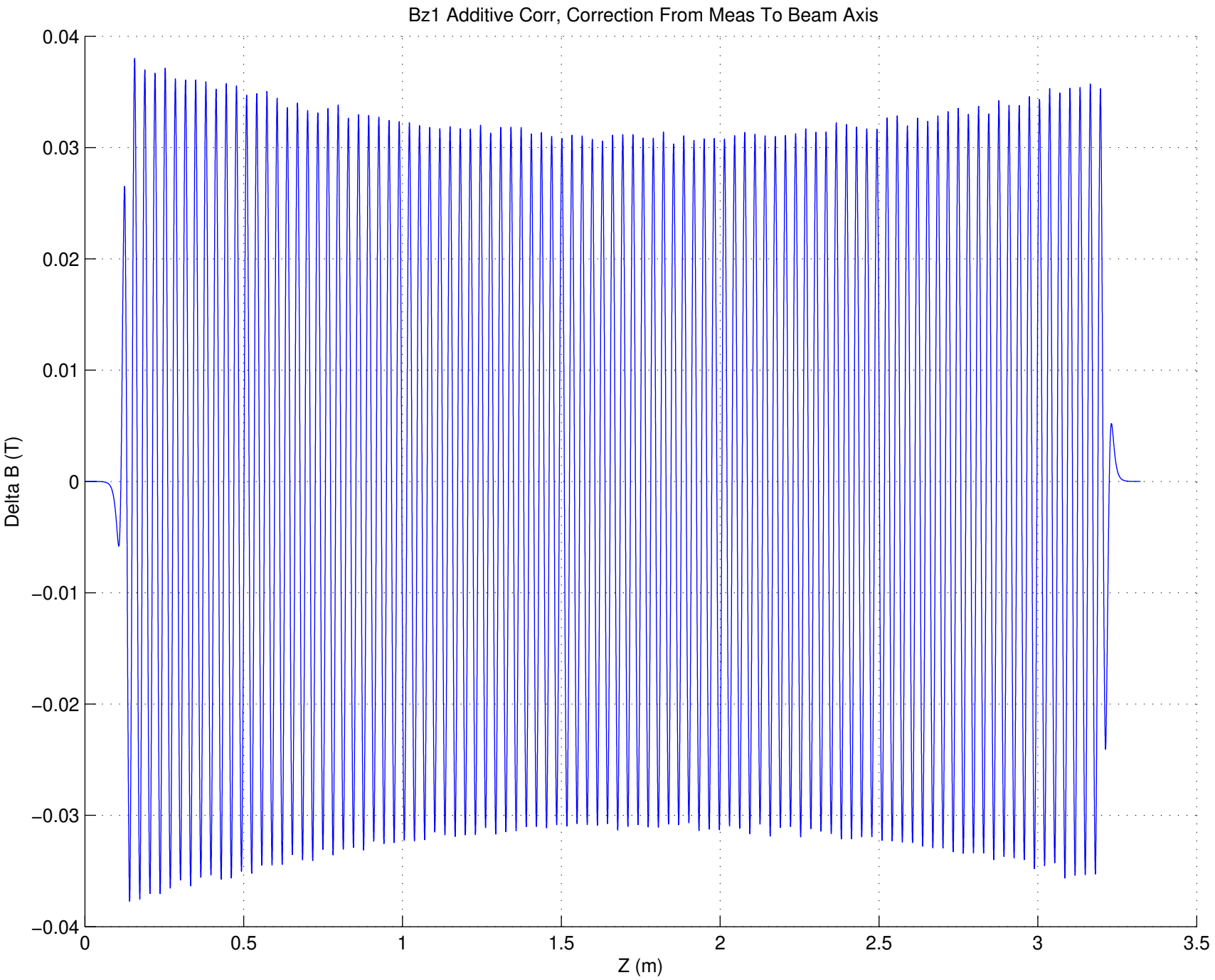

Y Probe, Probe Position From The Laser System
x 10^-5
6
4
2
0
−2
−4
−6
Y Probe (m)
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)

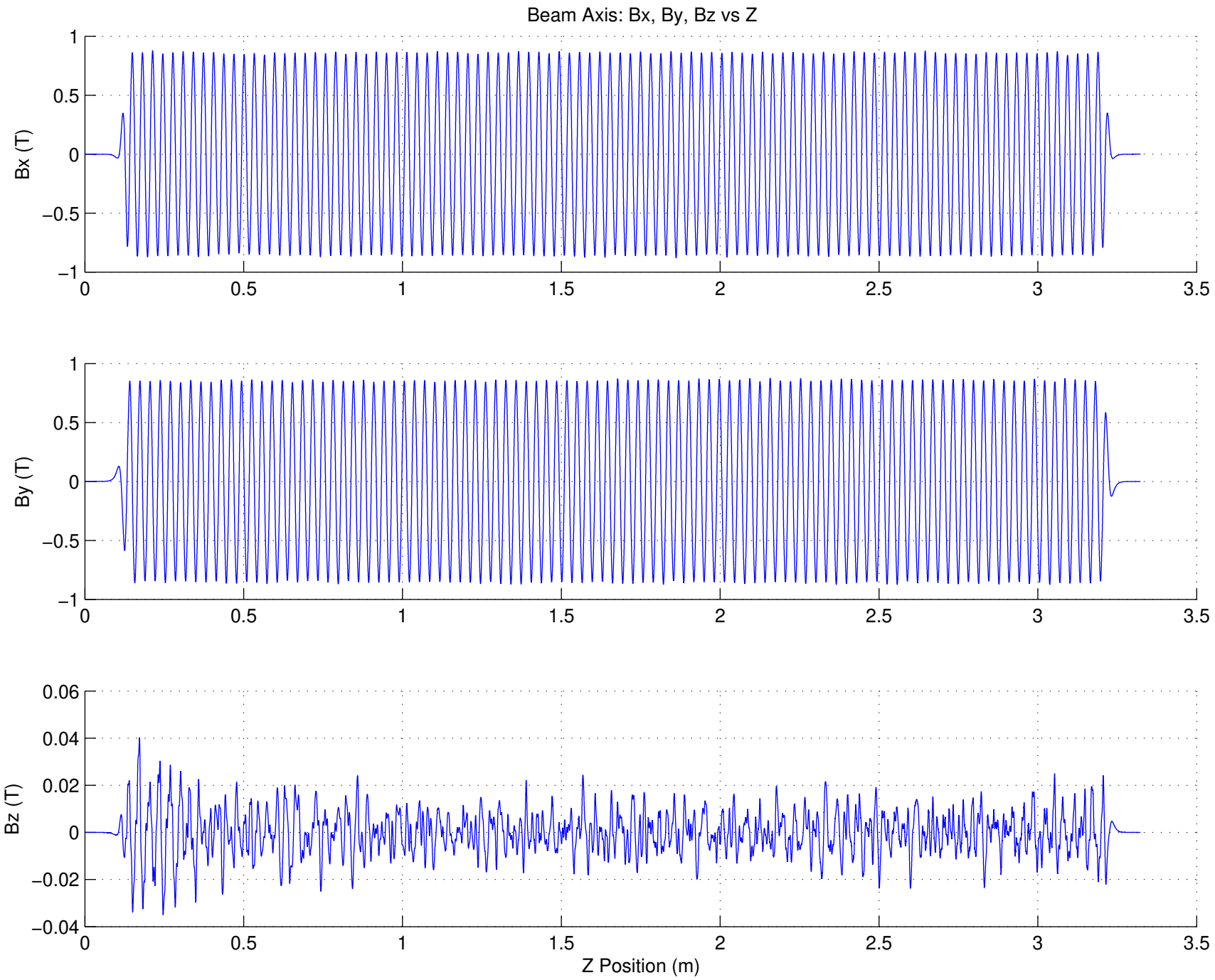

X Center, X Beam Axis, Magnetic Center Rel Reference Axis
x 10^-4
−0.5
−1
−1.5
−2
−2.5
−3
X Center, X Beam Axis (m)
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)


Y Center, Y Beam Axis, Magnetic Center Rel Reference Axis
x 10^-4
1
0.5
0
−0.5
−1
−1.5
−2
0
0.5
1
1.5
2
2.5
3
3.5
Y Center, Y Beam Axis (m)
Z (m)


Bx1 Additive Corr, Correction From Meas To Beam Axis
Delta B (T)
Z (m)
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
0
0.5
1
1.5
2
2.5
3
3.5


By1 Additive Corr, Correction From Meas To Beam Axis
Delta B (T)
Z (m)
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
0
0.5
1
1.5
2
2.5
3
3.5


Bz1 Additive Corr, Correction From Meas To Beam Axis
Delta B (T)
Z (m)
0.04
0.03
0.02
0.01
0
−0.01
−0.02
−0.03
−0.04
0
0.5
1
1.5
2
2.5
3
3.5


Beam Axis: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
Z Position (m)
1
0.5
0
−0.5
−1
0.06
0.04
0.02
−0.02
−0.04
0
0.5
1
1.5
2
2.5
3
3.5