SLAC Magnetic Measurements

Hall Probe Array Analysis
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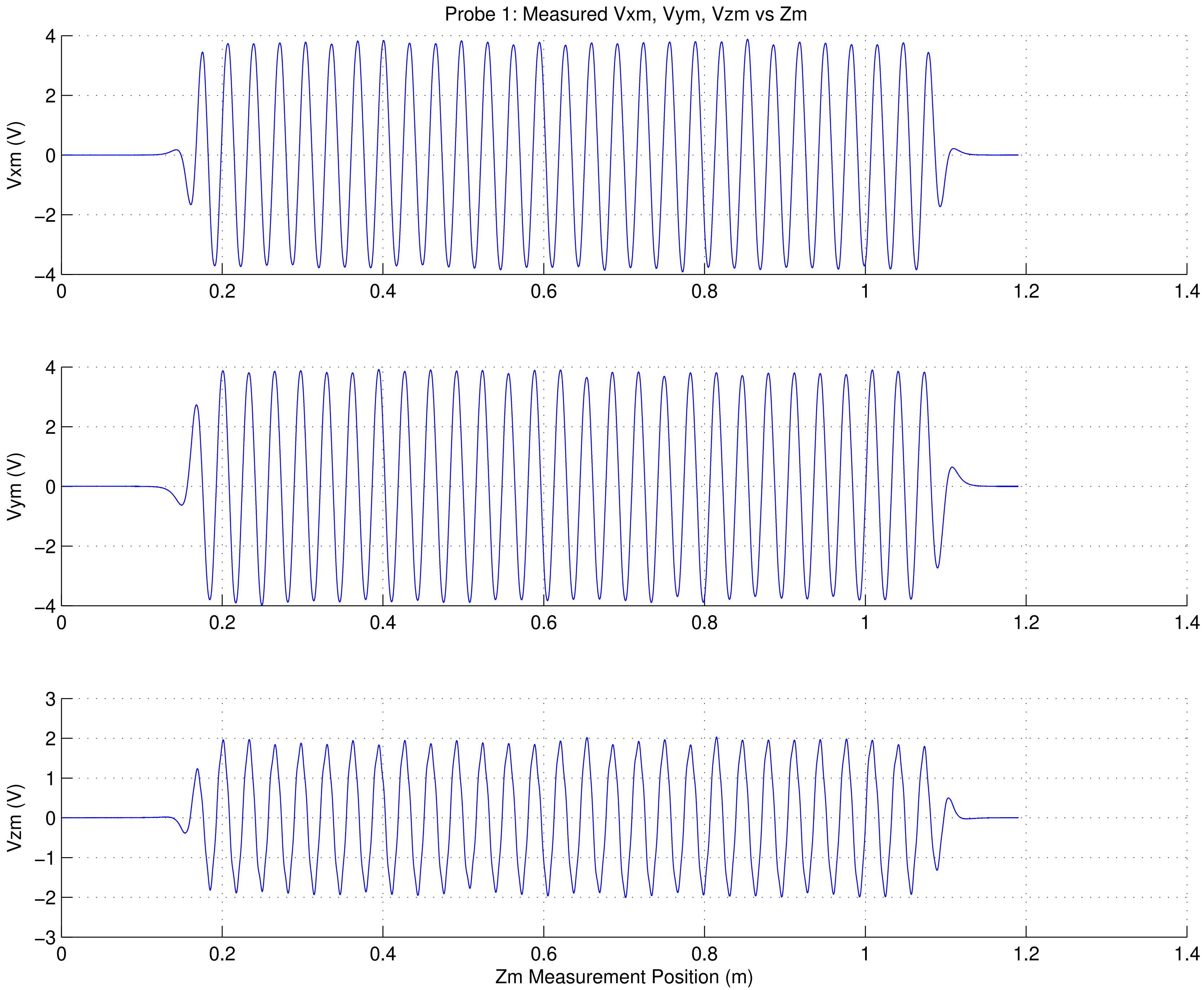
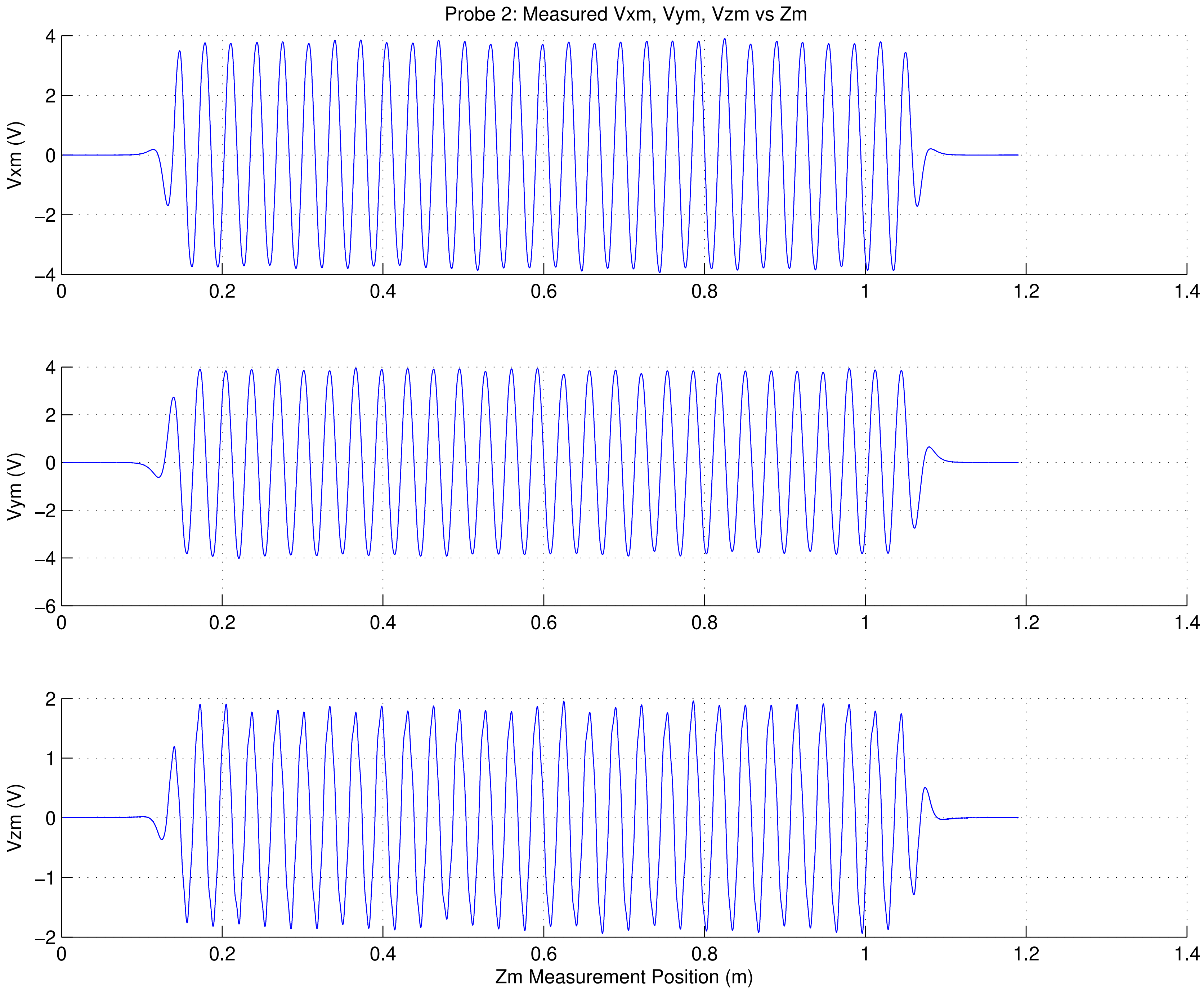
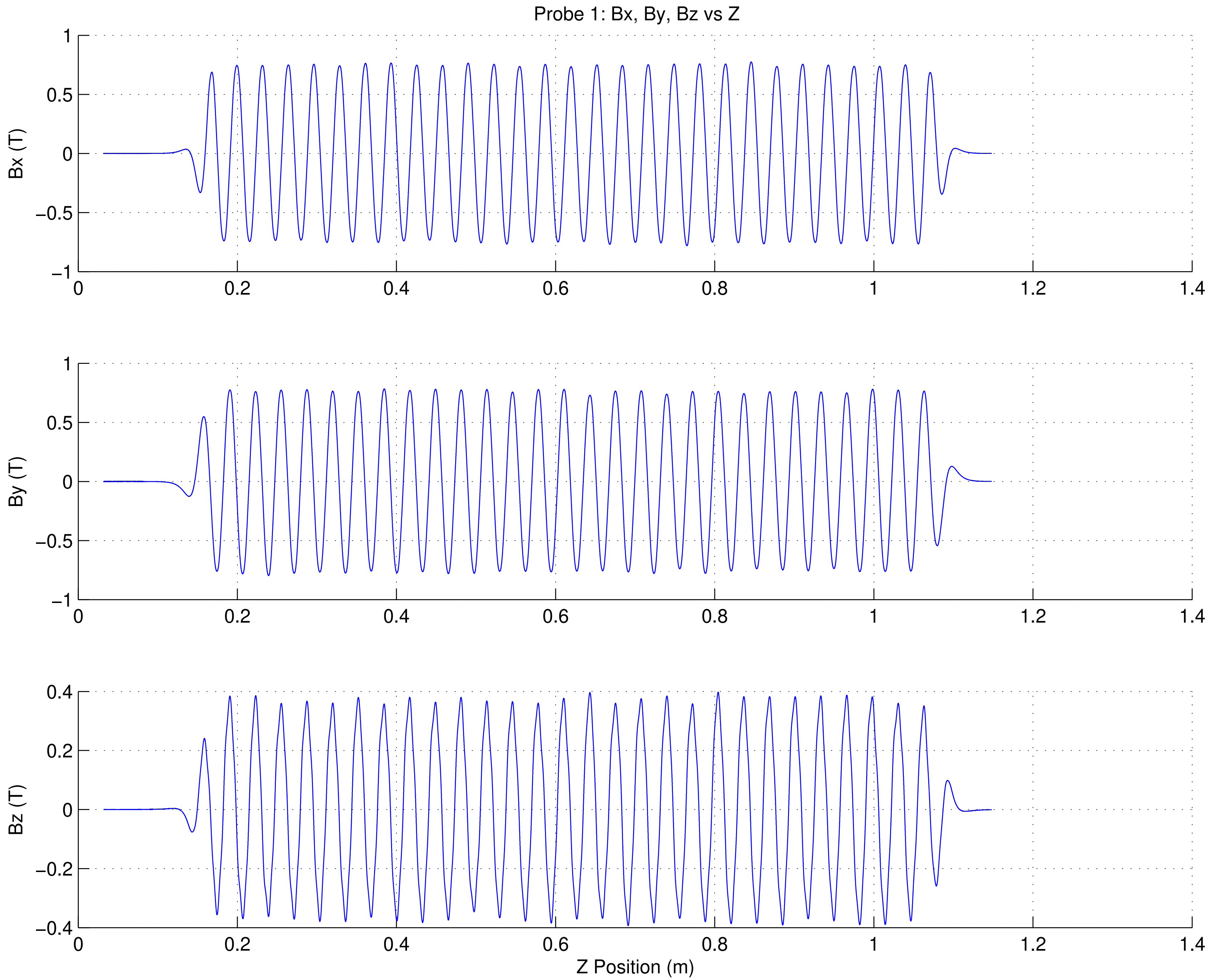
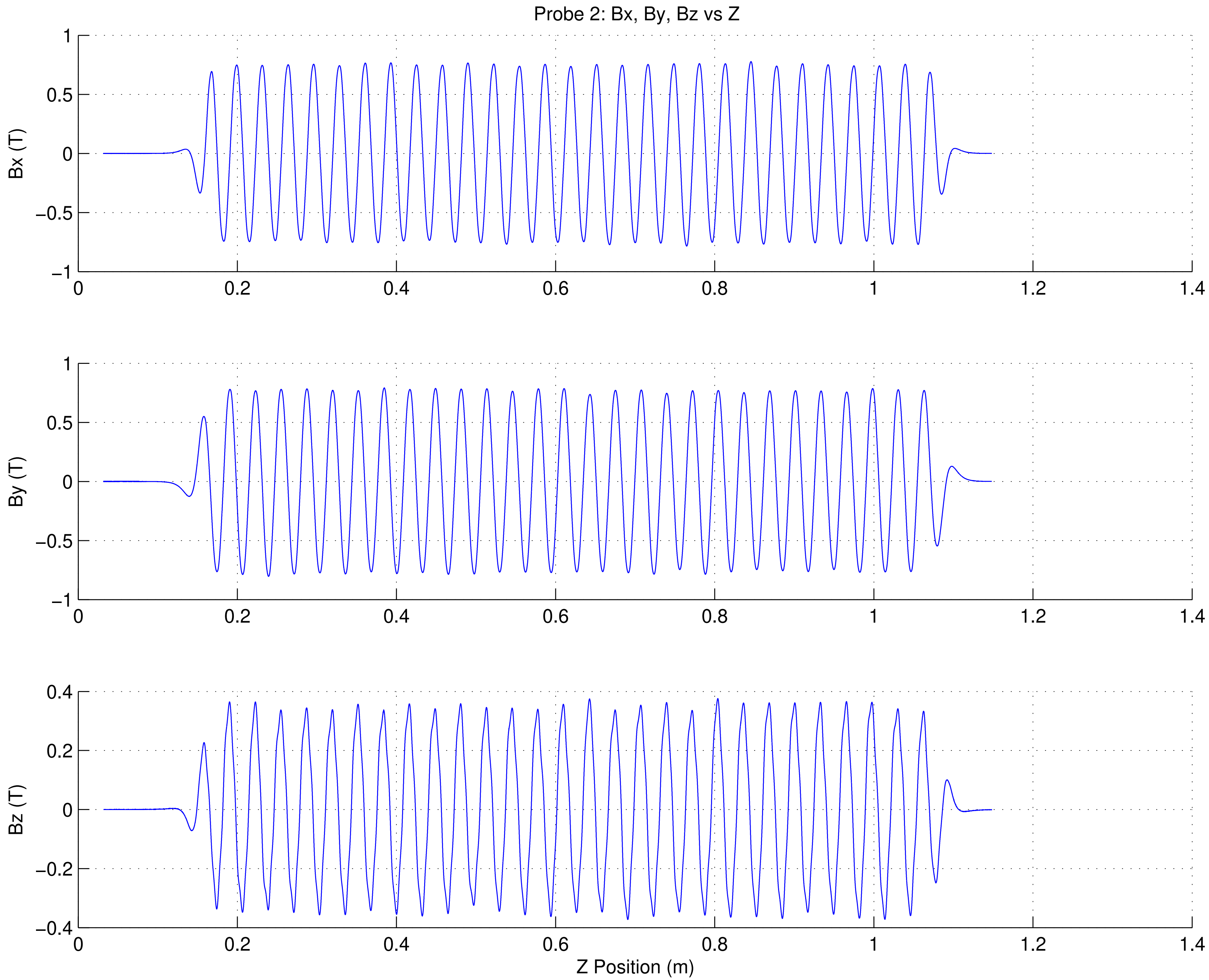
Parameters:
INPUT−FILE−DIR =V:\MET\MagServe\MagData\DELTA\Delta data\Run 184\
INPUT−FILE−NAME =DUTestOutput−184.dat
INPUT−FILE−TYPE =ZVXYZVXYZH
UND−POL−MODE =CIRC−POL−RIGHT−HAND
PROBE1−BX−CALIB−FILE =V:\MET\MagServe\MagData\LCLS\Hall probe\SENIS−120−12\HPCS−080\calib.mat
PROBE1−BY−CALIB−FILE =V:\MET\MagServe\MagData\LCLS\Hall probe\SENIS−120−12\HPCS−079\calib.mat
PROBE2−BX−CALIB−FILE =V:\MET\MagServe\MagData\LCLS\Hall probe\SENIS−119−12\HPCS−001\calib.mat
PROBE2−BY−CALIB−FILE =V:\MET\MagServe\MagData\LCLS\Hall probe\SENIS−119−12\HPCS−002\calib.mat
NUM−ZERO−GAUSS−MEAS =200
PROBE2−OFFSET−DIR =Y
PROBE2−OFFSET−X−DIST (m) =1.5e−05
PROBE2−OFFSET−Y−DIST (m) =0.0001
PROBE2−BX−ROLL (rad) =−0.0095993
PROBE2−BY−ROLL (rad) =−0.039444
PROBE1−BY−ROLL (rad) =−0.031416

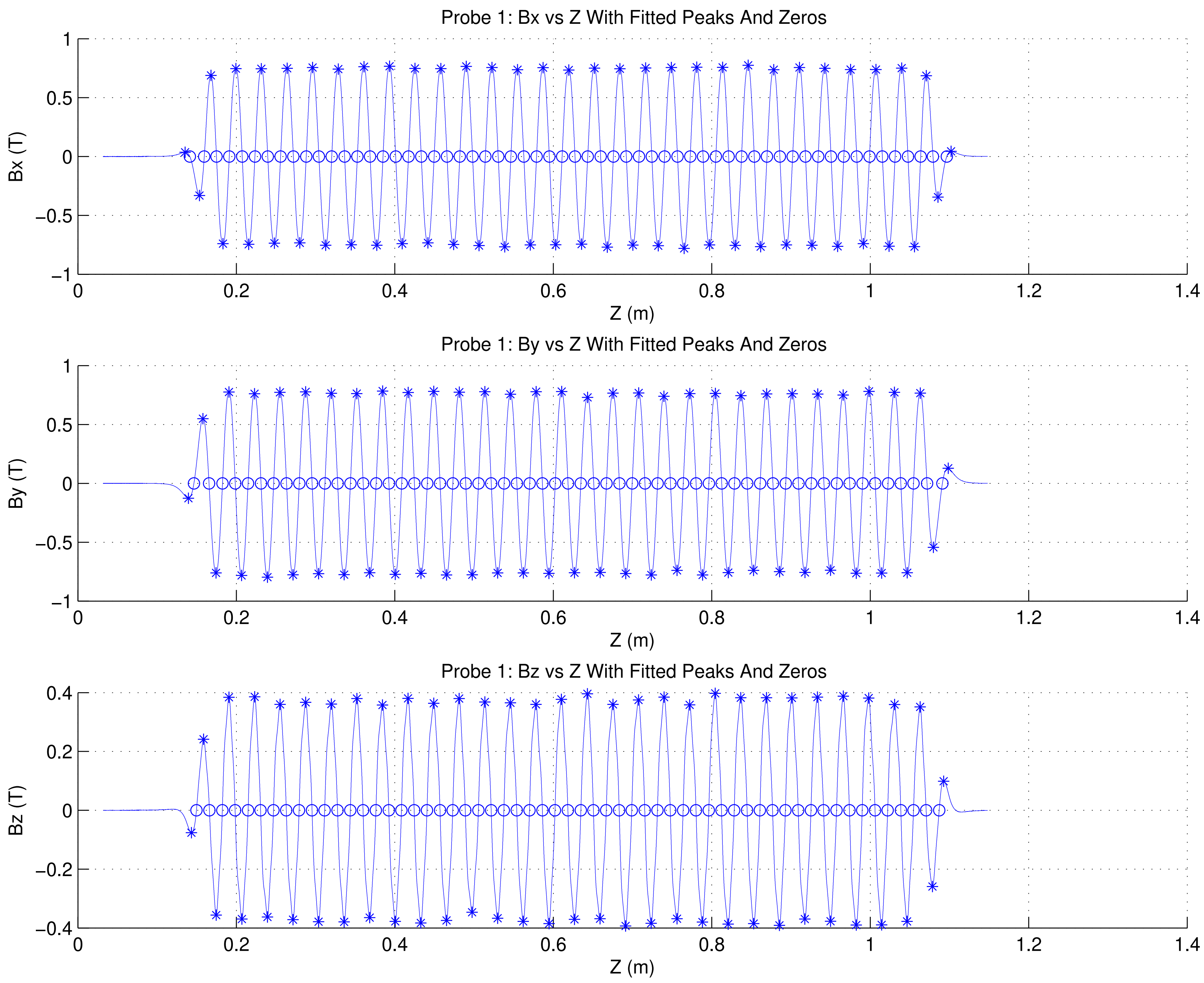

Probe 1: Measured Vxm, Vym, Vzm vs Zm
Vxm (V)
Vym (V)
Vzm (V)
Zm Measurement Position (m)
4
2
0
−2
−4
3
1
−1
−3
0
0.2
0.4
0.6
0.8
1
1.2
1.4


Probe 2: Measured Vxm, Vym, Vzm vs Zm
Vxm (V)
Vym (V)
Vzm (V)
4
2
0
−2
−4
−6
1
−1
0.2
0.4
0.6
0.8
1.2
1.4
Zm Measurement Position (m)

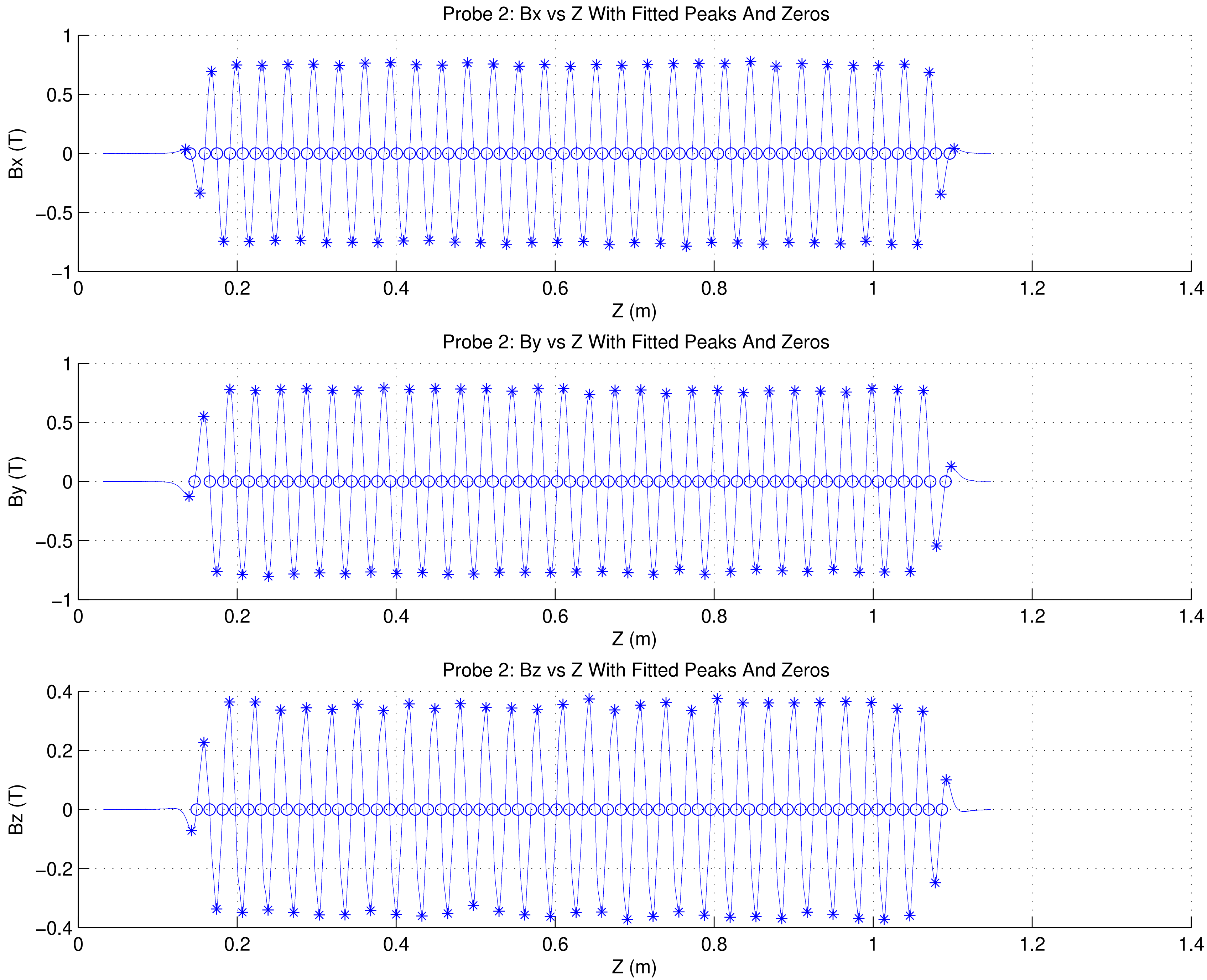

Probe 1: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
Z Position (m)
1
0.5
0
−0.5
−1
0.4
0.2
−0.2
−0.4
0.2
0.4
0.6
0.8
1
1.2
1.4



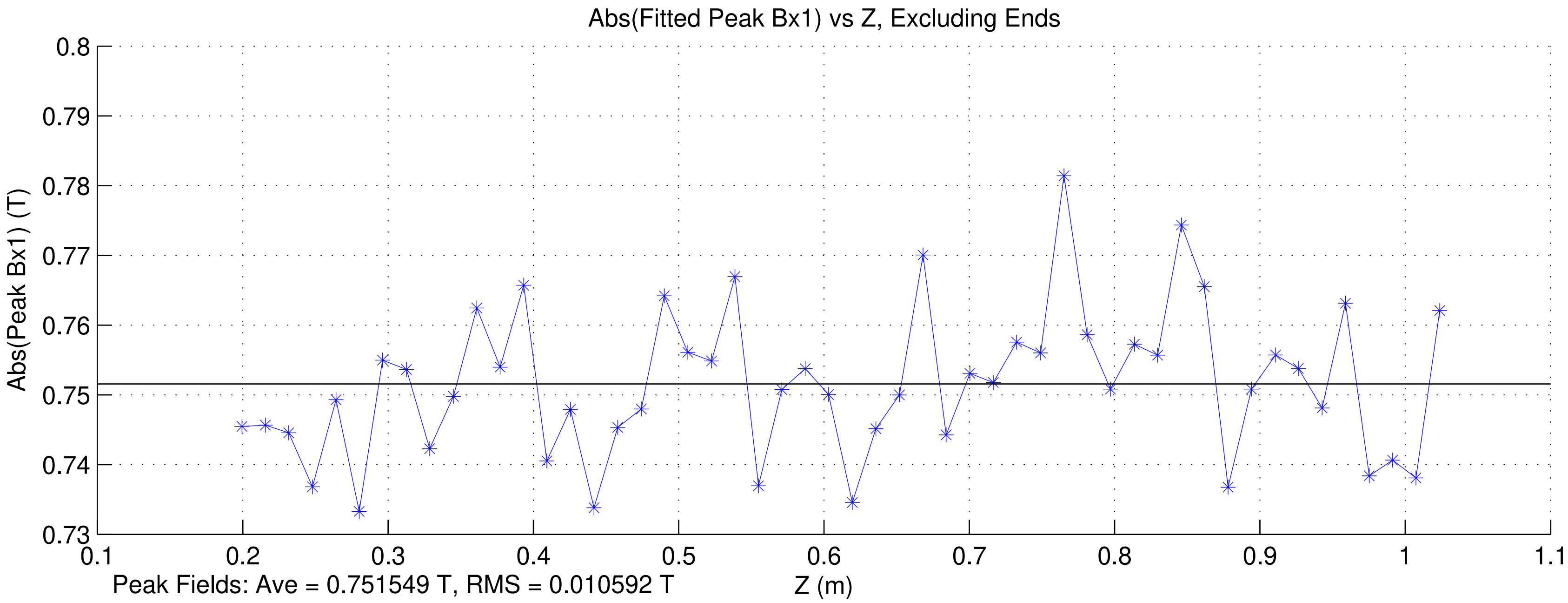
Probe 2: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
Z Position (m)
1
0.5
0
−0.5
−1
0.4
0.2
−0.2
−0.4
0.6
0.8
1.2
1.4



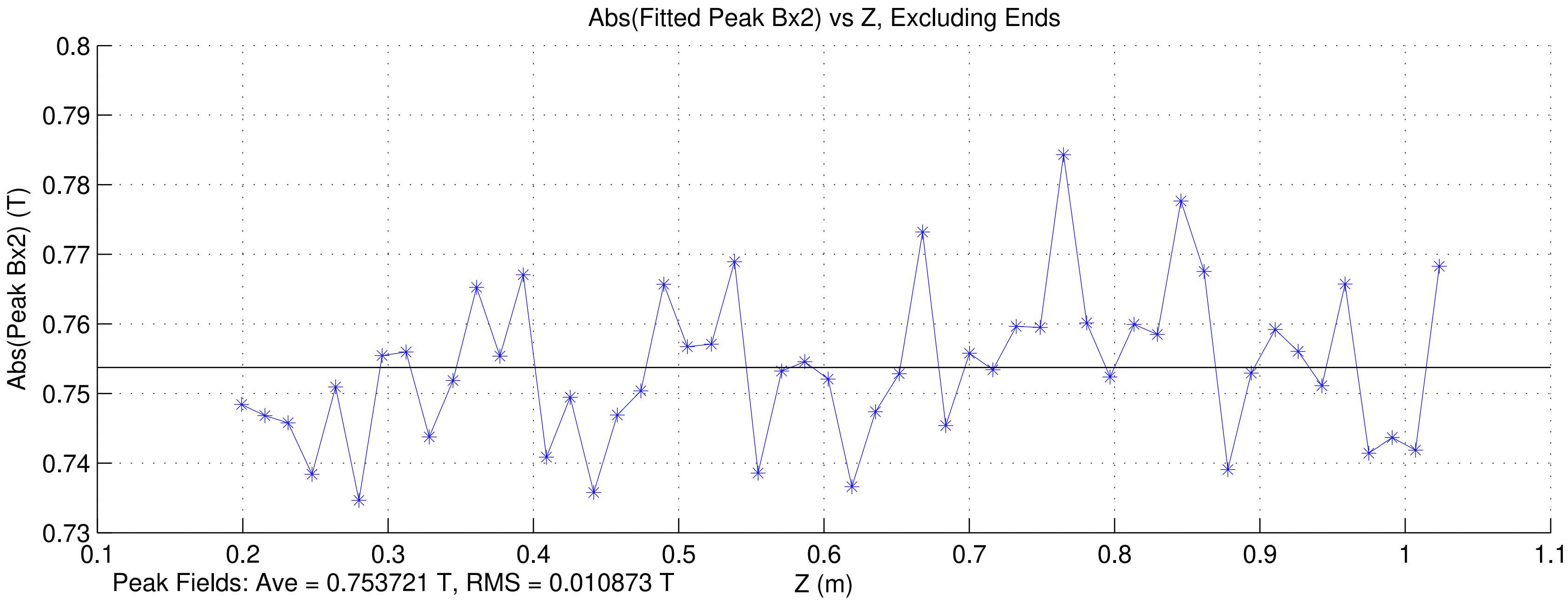
Probe 1: Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
Probe 1: By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
Probe 1: Bz vs Z With Fitted Peaks And Zeros
Bz (T)
Z (m)



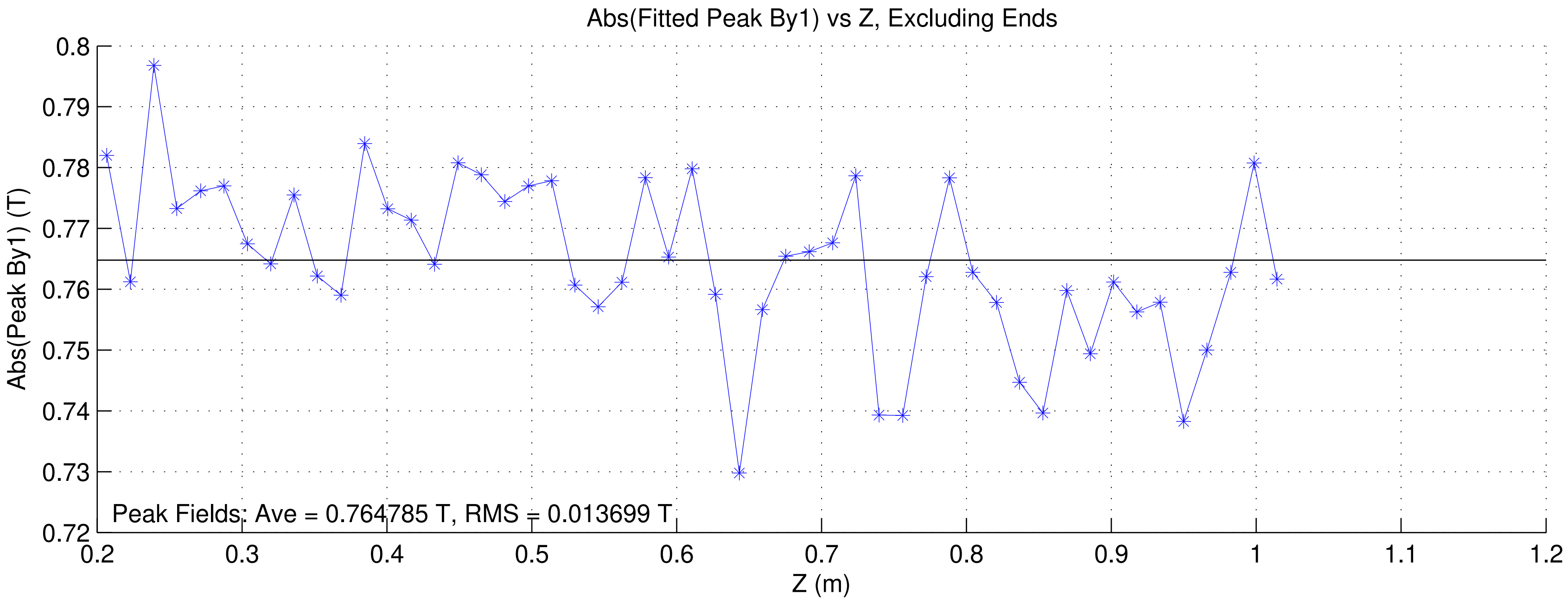
Probe 2: Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
Probe 2: By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
Probe 2: Bz vs Z With Fitted Peaks And Zeros
Bz (T)
Z (m)

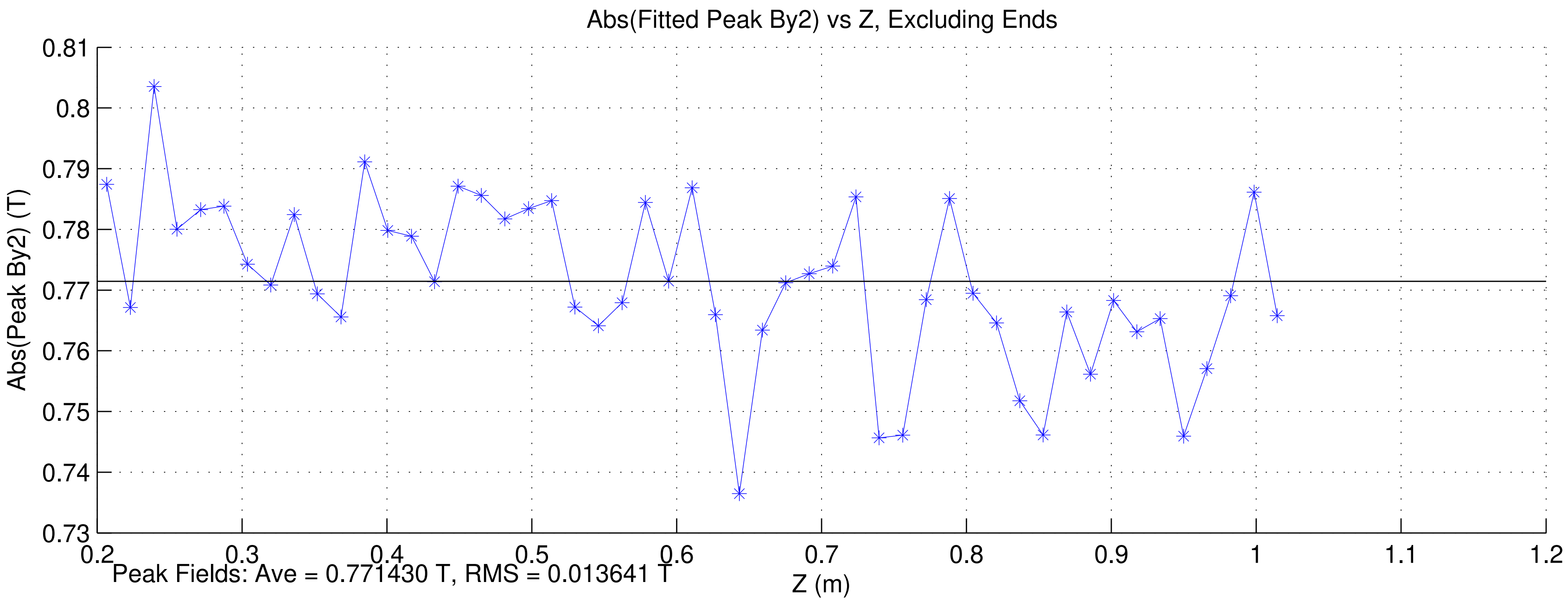


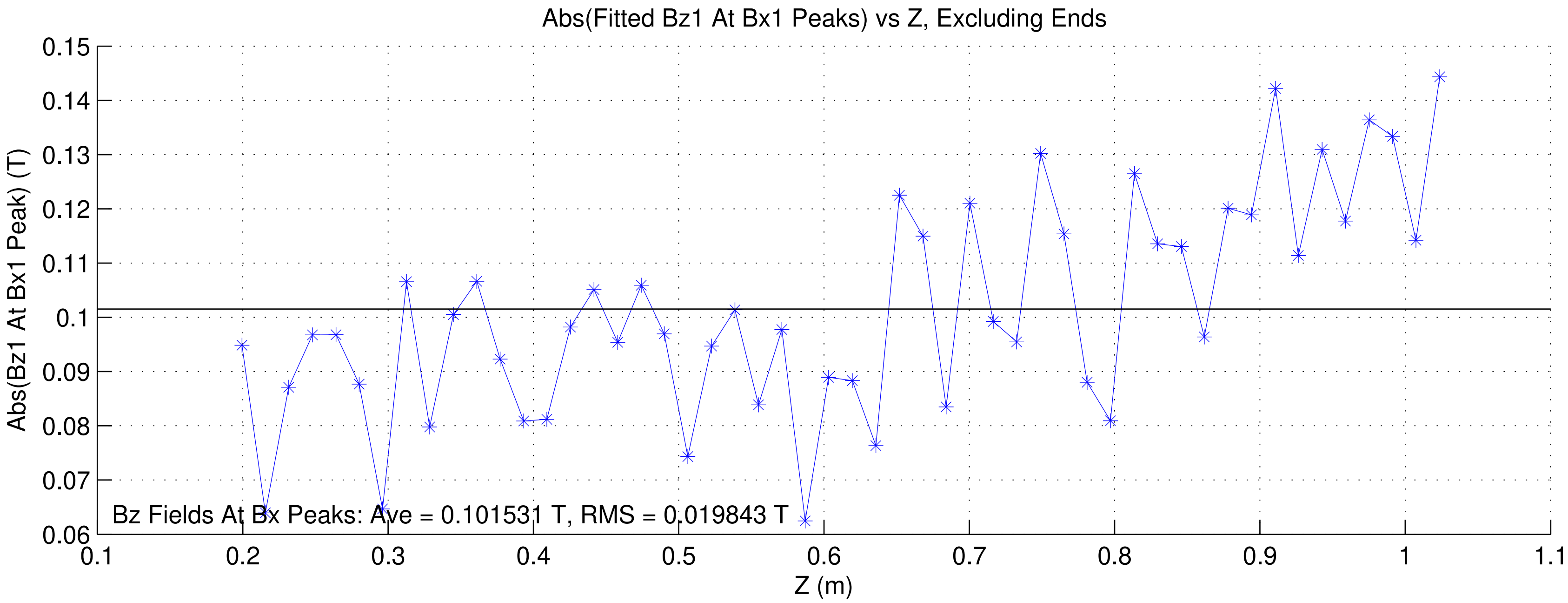

Peak Fields: Ave = 0.751549 T, RMS = 0.010592 T

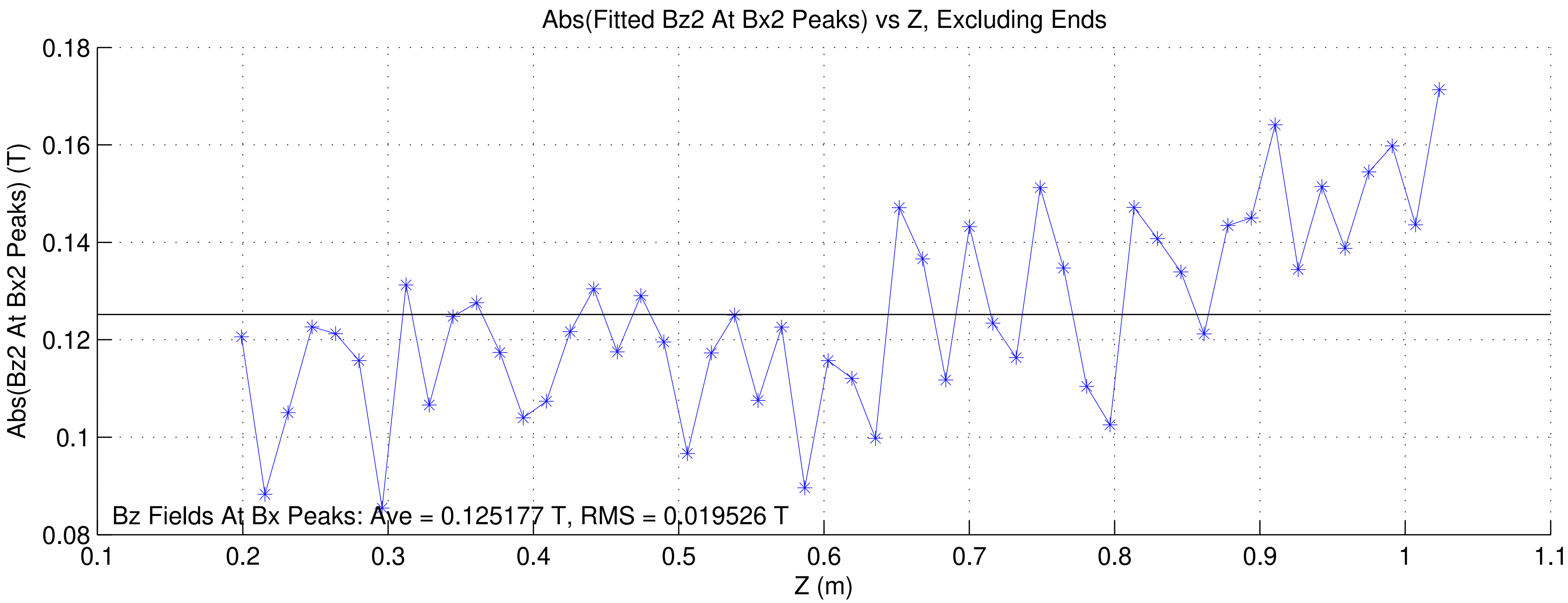


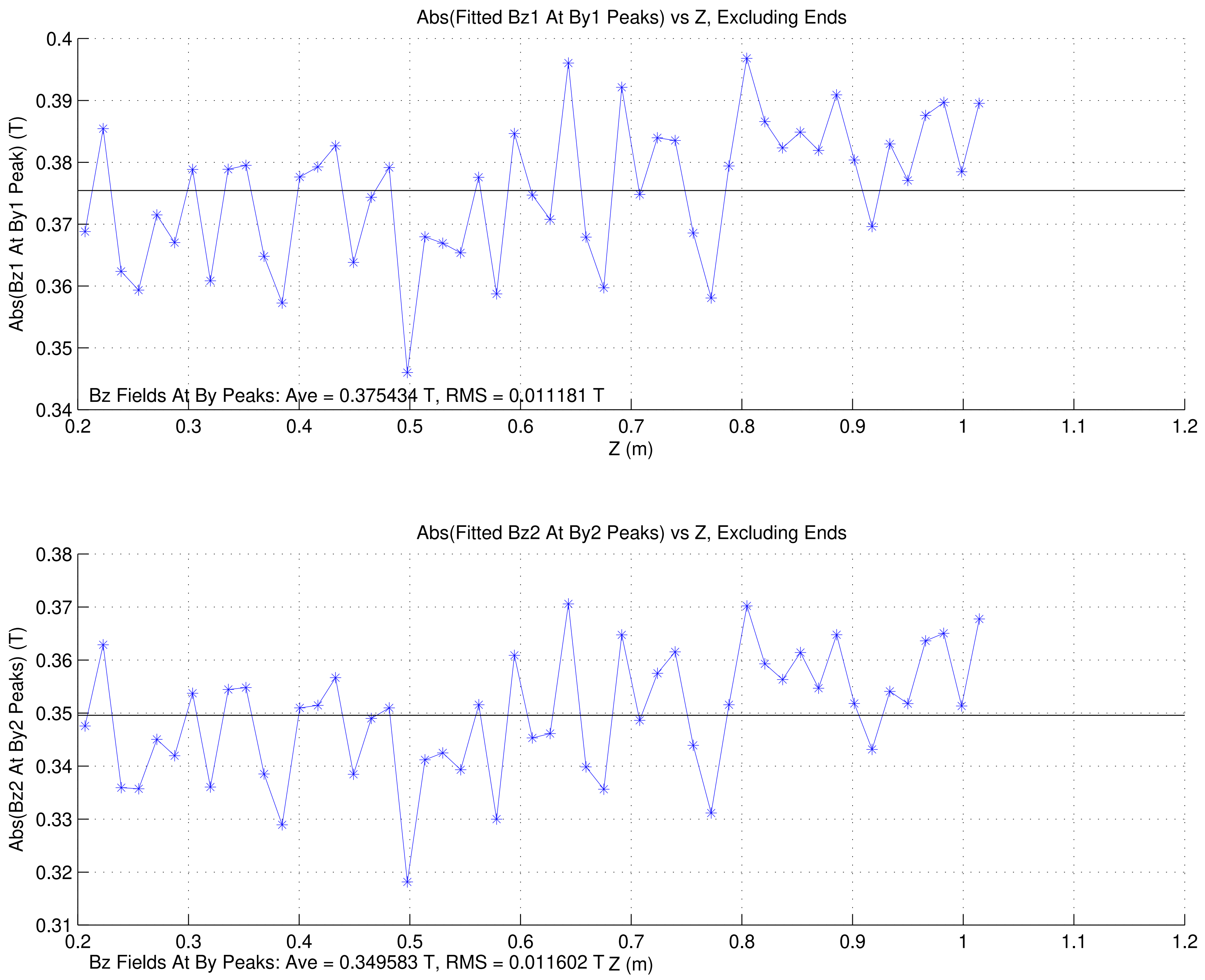

Peak Fields: Ave = 0.753721 T, RMS = 0.010873 T

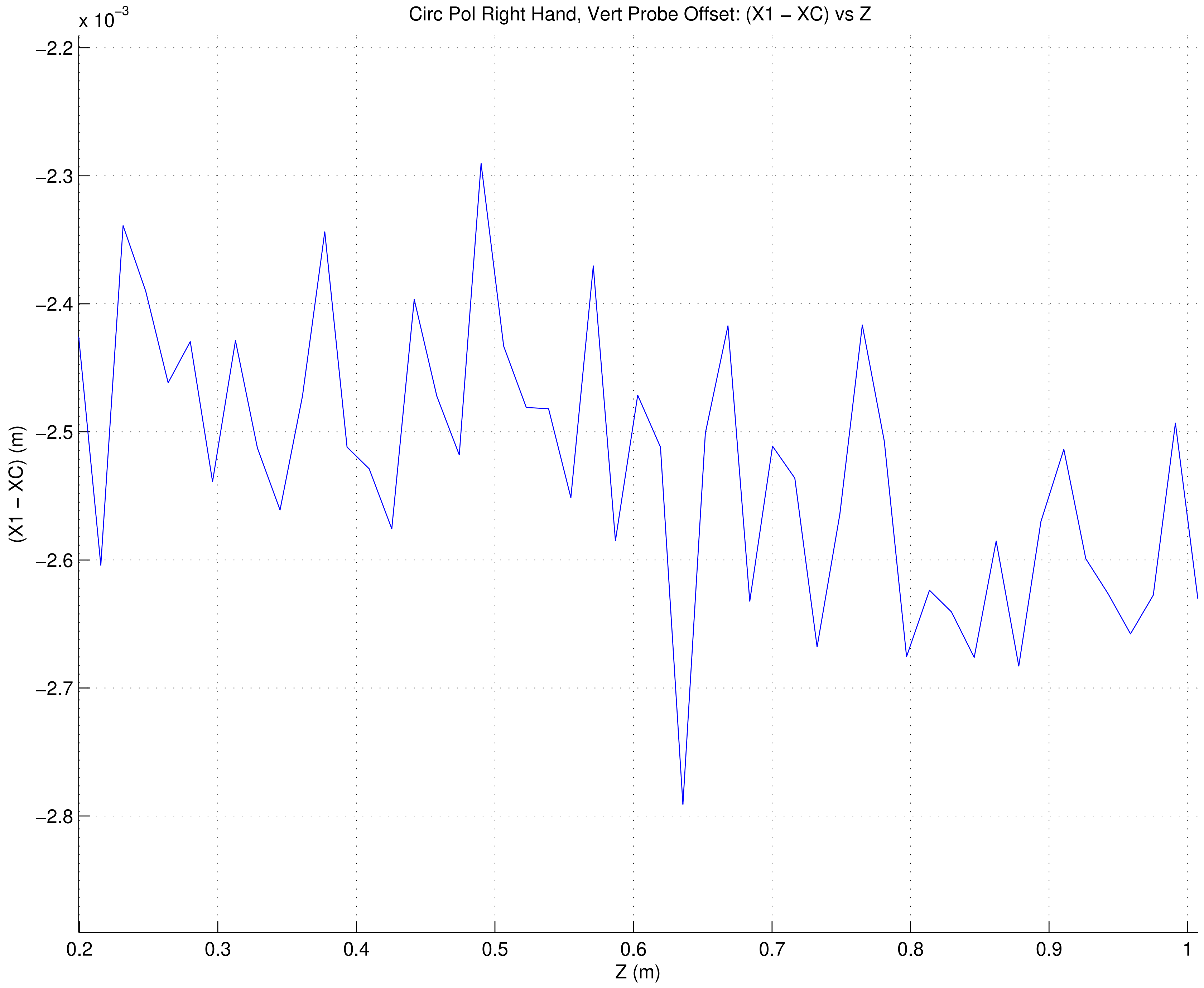

Abs(Fitted Peak By1) vs Z, Excluding Ends
Abs(Peak By1) (T)
Z (m)
Peak Fields: Ave = 0.764785 T, RMS = 0.013699 T


Abs(Fitted Peak By2) vs Z, Excluding Ends
Abs(Peak By2) (T)
Z (m)
Peak Fields: Ave = 0.771430 T, RMS = 0.013641 T

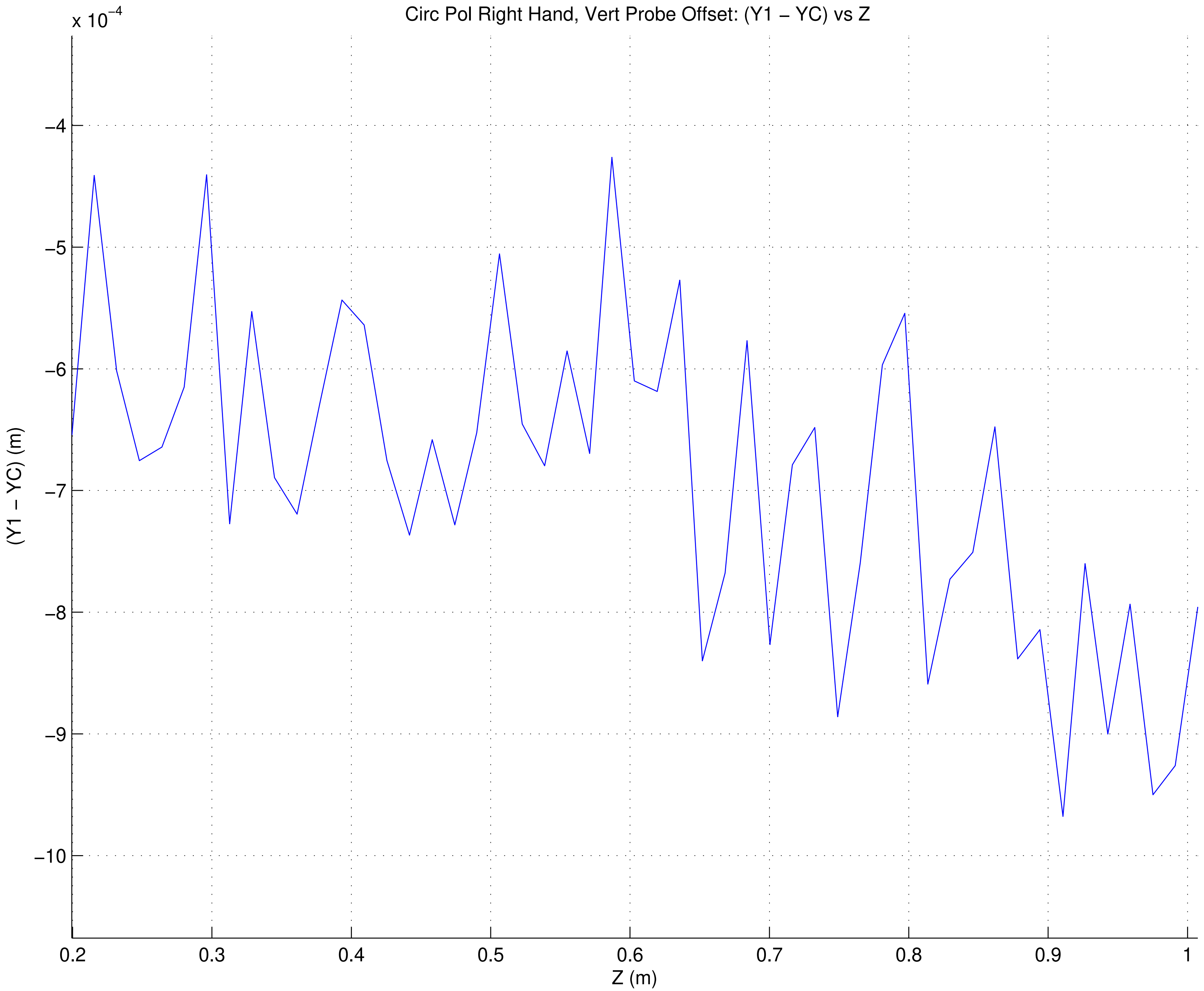

Abs(Fitted Bz1 At Bx1 Peaks) vs Z, Excluding Ends
Abs(Bz1 At Bx1 Peak) (T)
Z (m)
Bz Fields At Bx Peaks: Ave = 0.101531 T, RMS = 0.019843 T

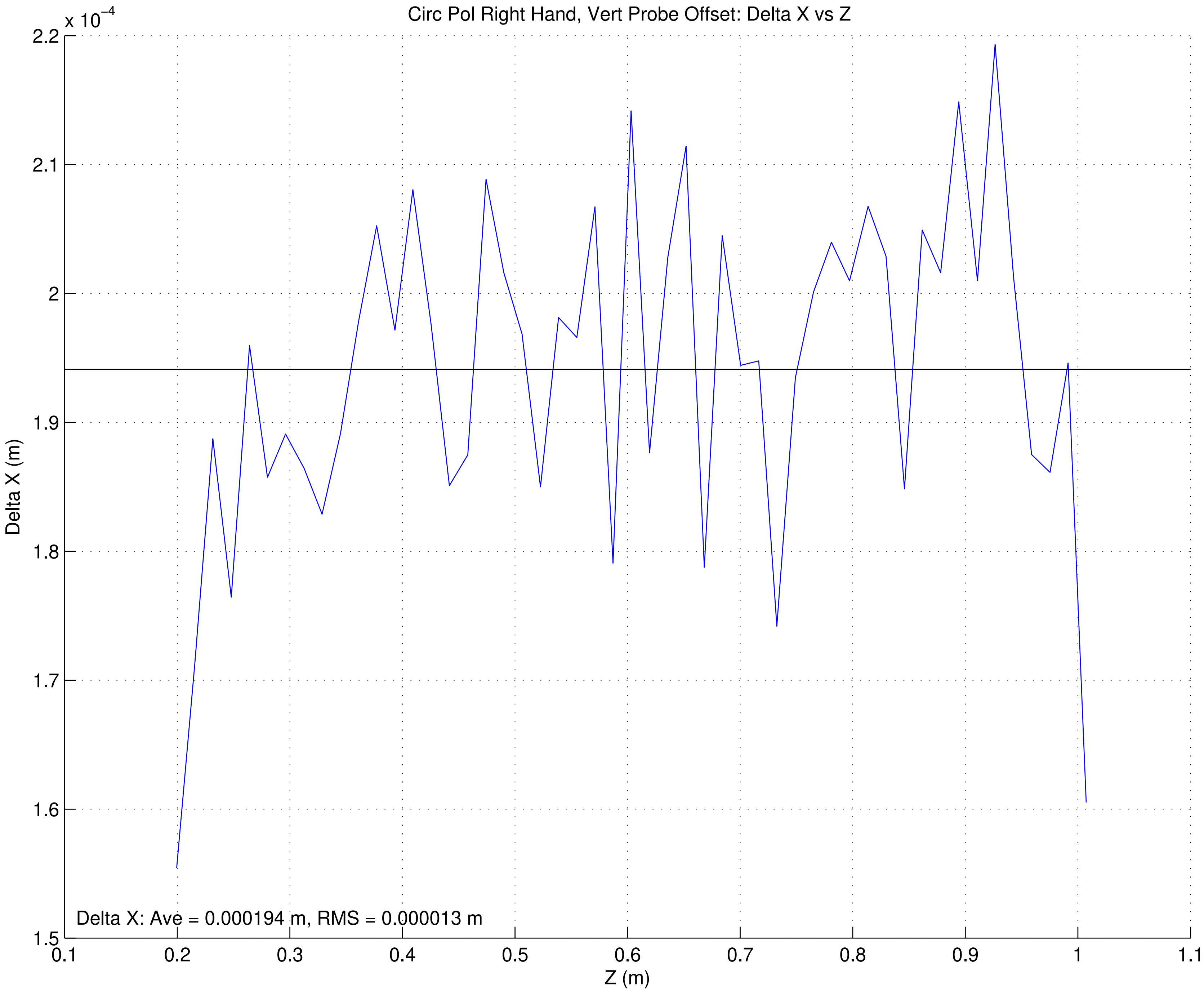

Abs(Fitted Bz2 At Bx2 Peaks) vs Z, Excluding Ends
Abs(Bz2 At Bx2 Peaks) (T)
Z (m)
Bz Fields At Bx Peaks: Ave = 0.125177 T, RMS = 0.019526 T

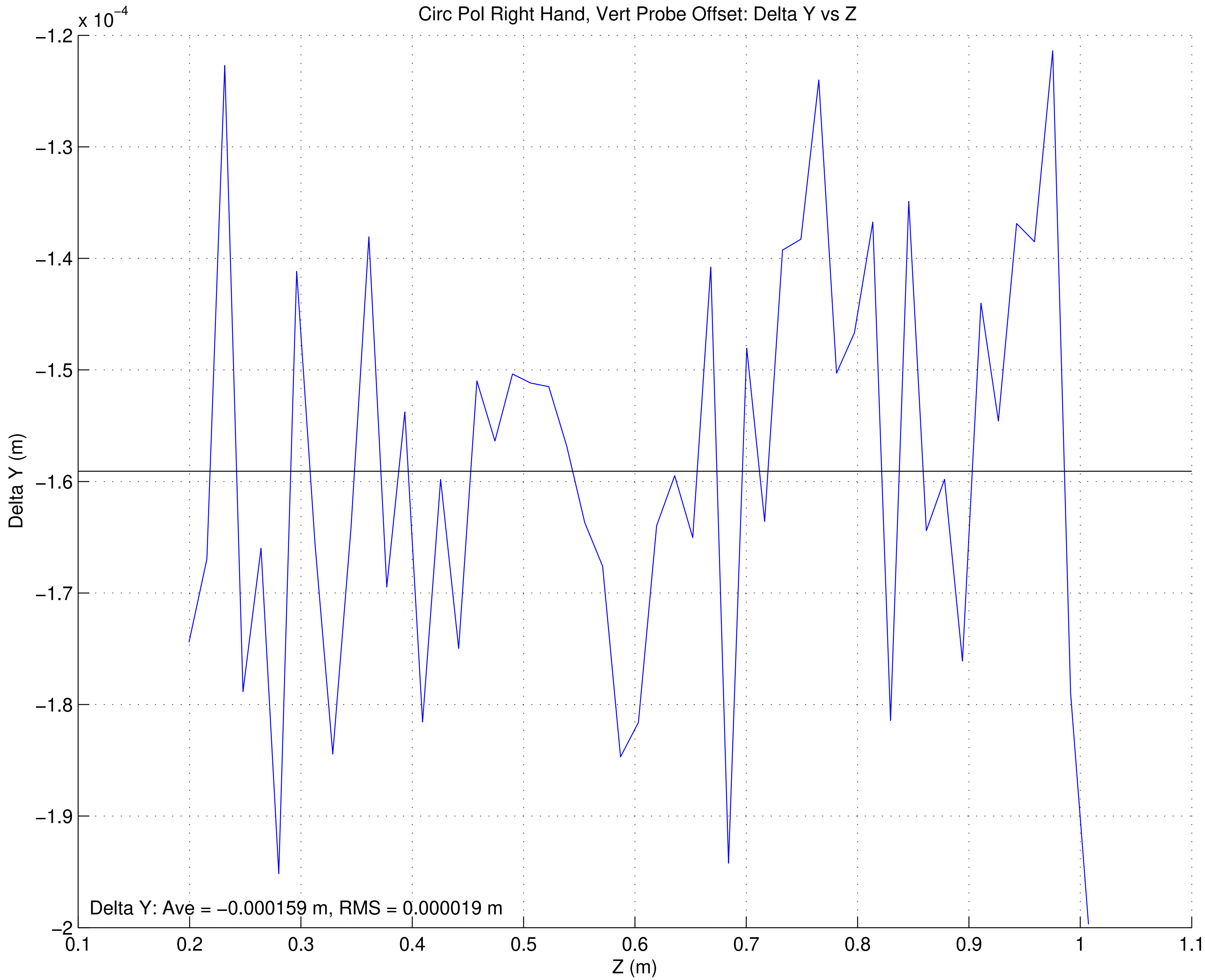

Abs(Fitted Bz1 At By1 Peaks) vs Z, Excluding Ends
Abs(Bz1 At By1 Peak) (T)
Z (m)
Bz Fields At By Peaks: Ave = 0.375434 T, RMS = 0.011181 T
Abs(Fitted Bz2 At By2 Peaks) vs Z, Excluding Ends
Abs(Bz2 At By2 Peaks) (T)
Z (m)
Bz Fields At By Peaks: Ave = 0.349583 T, RMS = 0.011602 T



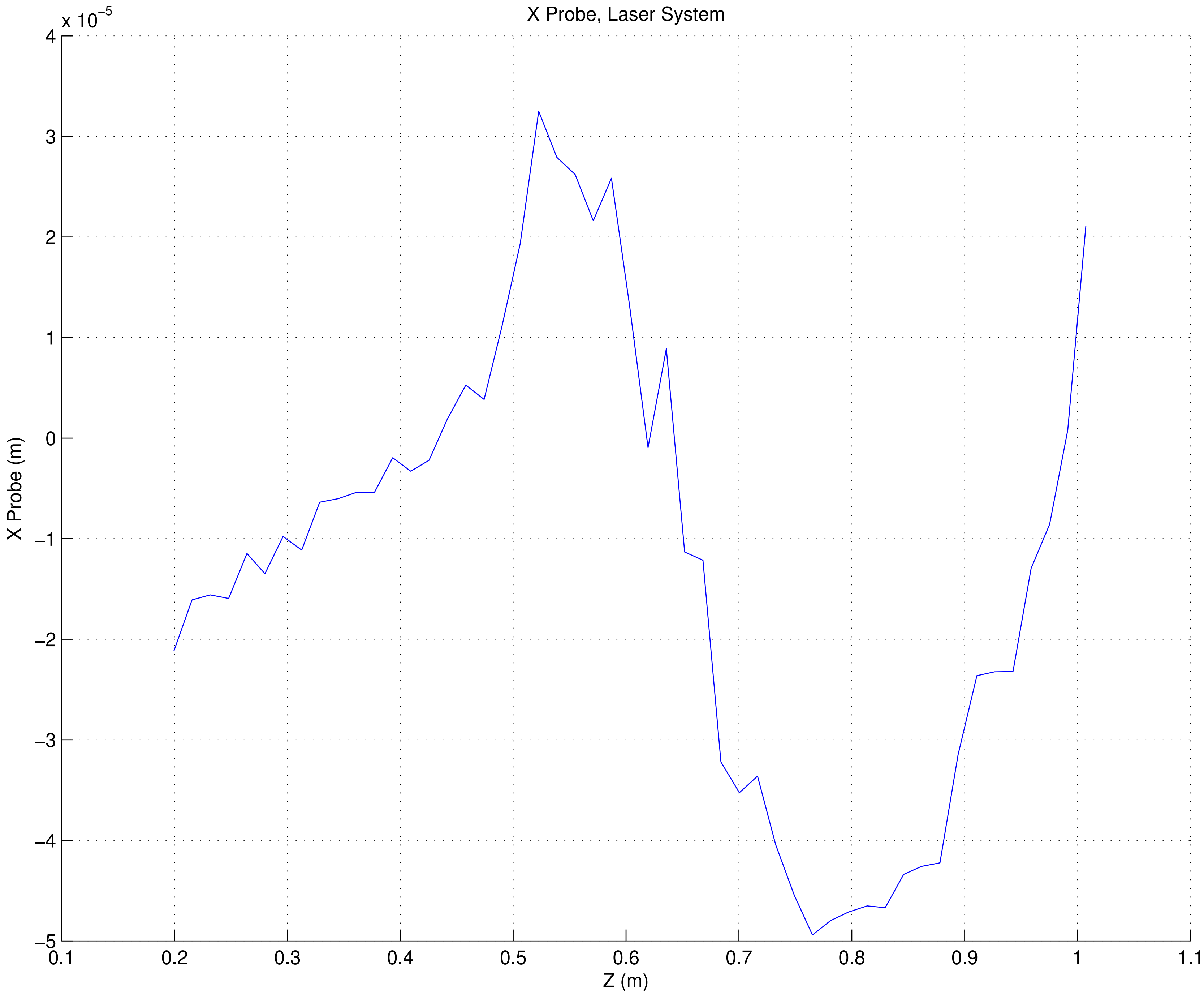
Circ Pol Right Hand, Vert Probe Offset: (X1 − XC) vs Z
x 10^−3
−2.2
−2.3
−2.4
−2.5
−2.6
−2.7
−2.8
(X1 − XC) (m)
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Z (m)


Circ Pol Right Hand, Vert Probe Offset: (Y1 − YC) vs Z
x 10^−4
−4
−5
−6
−7
−8
−9
−10
(Y1 − YC) (m)
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Z (m)

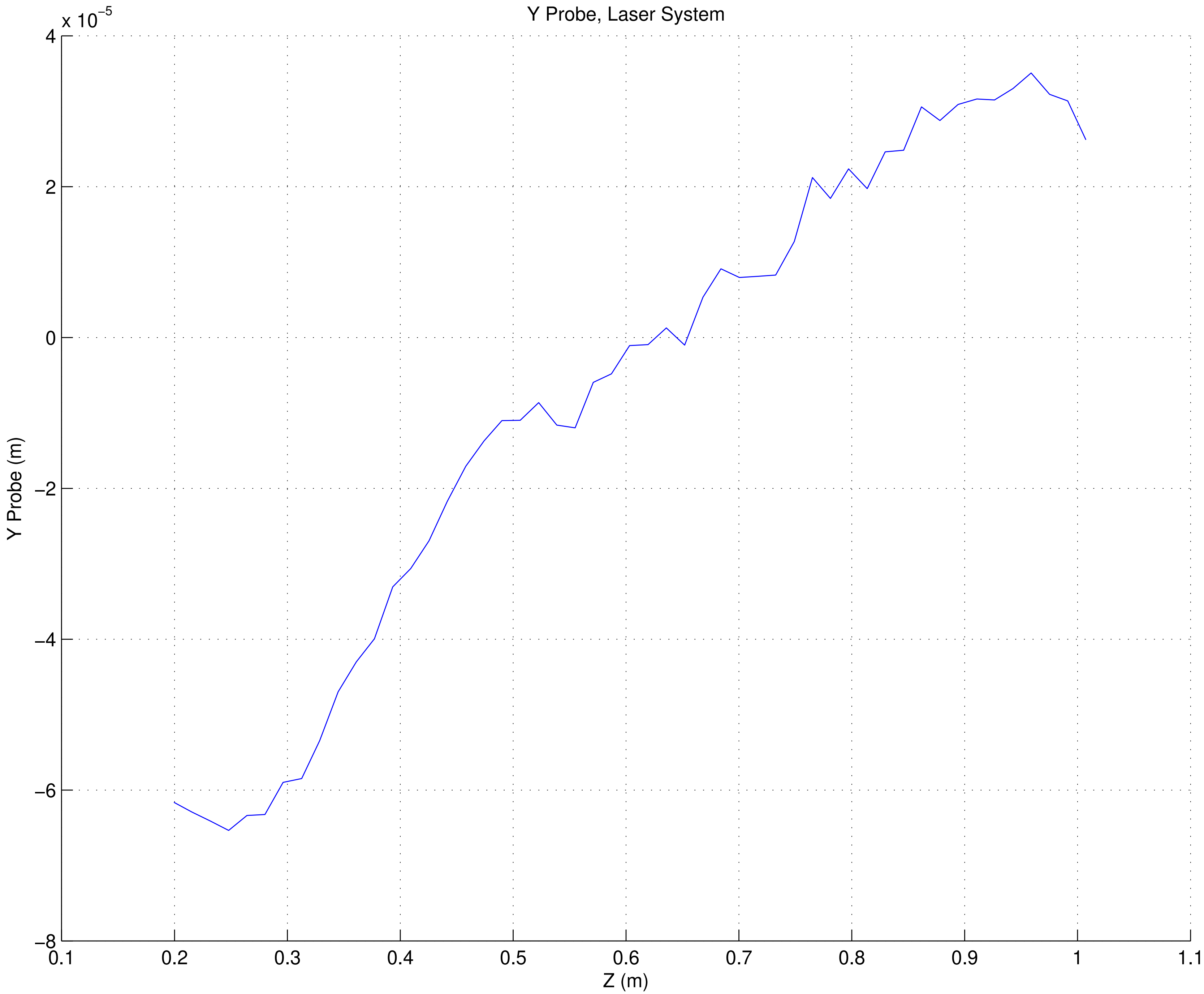

Circ Pol Right Hand, Vert Probe Offset: Delta X vs Z
x 10^-4
2.2
2.1
2
1.9
1.8
1.7
1.6
1.5
Delta X (m)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
Z (m)
Delta X: Ave = 0.000194 m, RMS = 0.000013 m



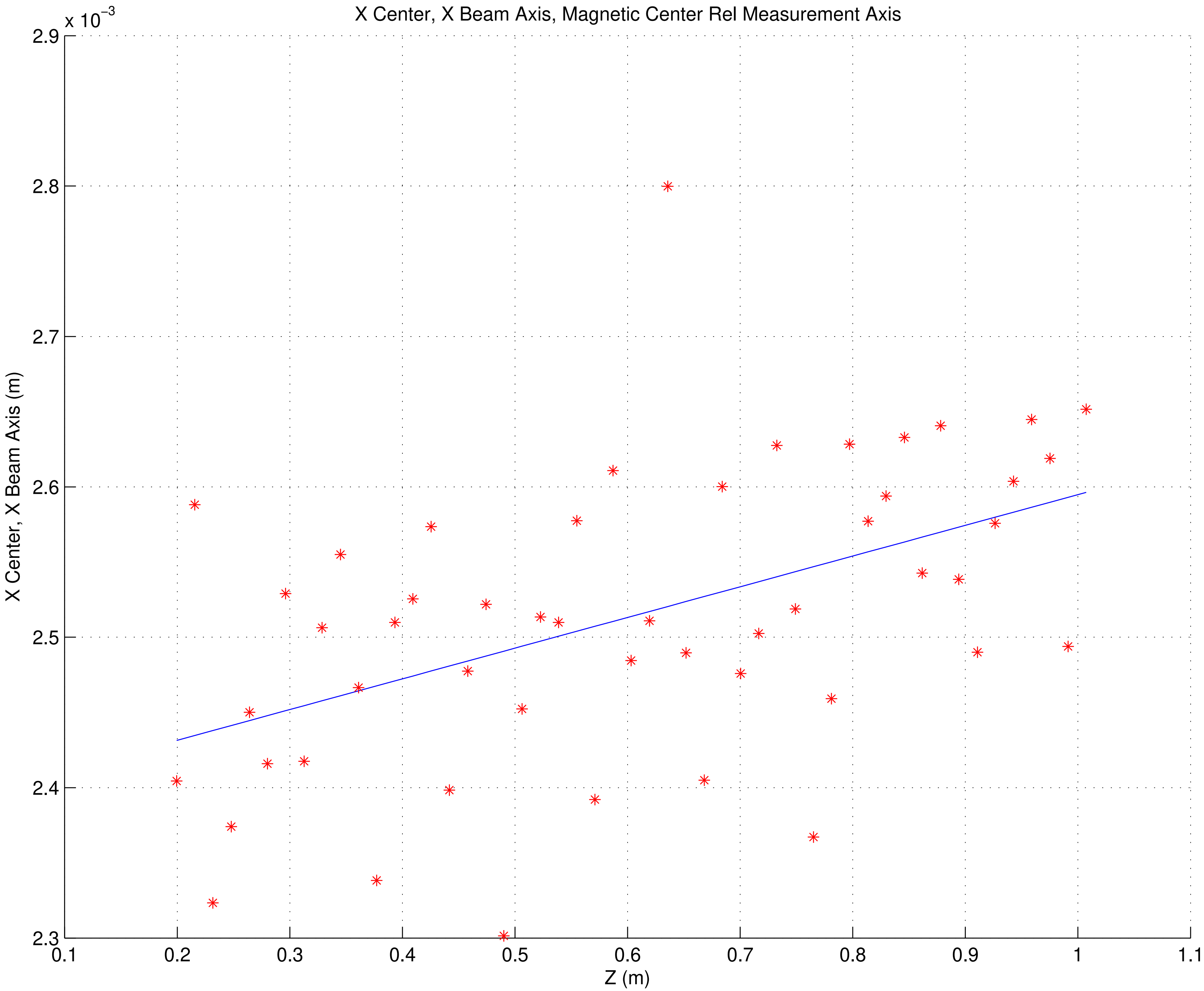
Circ Pol Right Hand, Vert Probe Offset: Delta Y vs Z
x 10^−4
−1.2
−1.3
−1.4
−1.5
−1.6
−1.7
−1.8
−1.9
−2
Delta Y (m)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
Z (m)
Delta Y: Ave = −0.000159 m, RMS = 0.000019 m

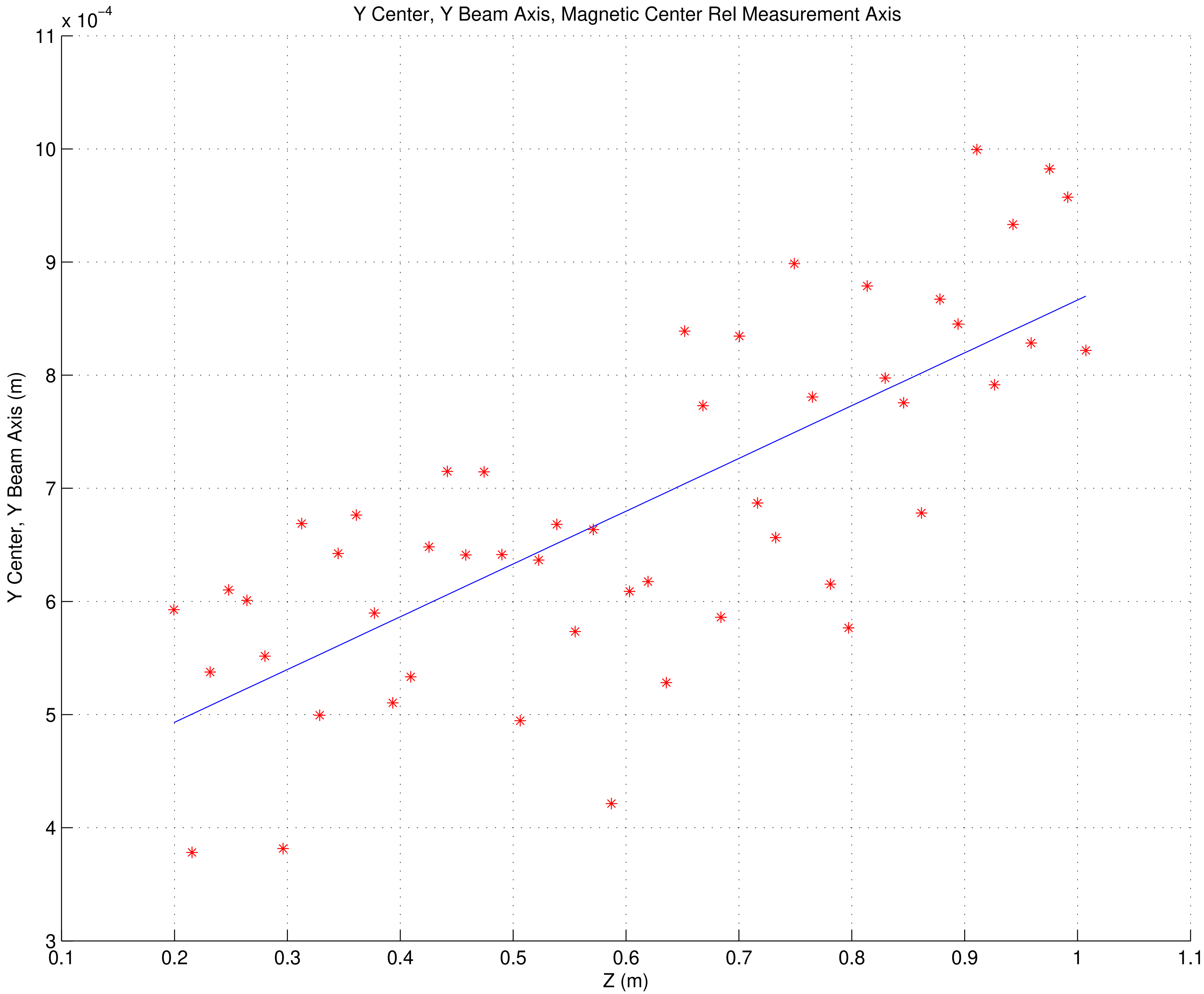


X Probe, Laser System
x 10^−5
4
3
2
1
0
−1
−2
−3
−4
−5
X Probe (m)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
Z (m)

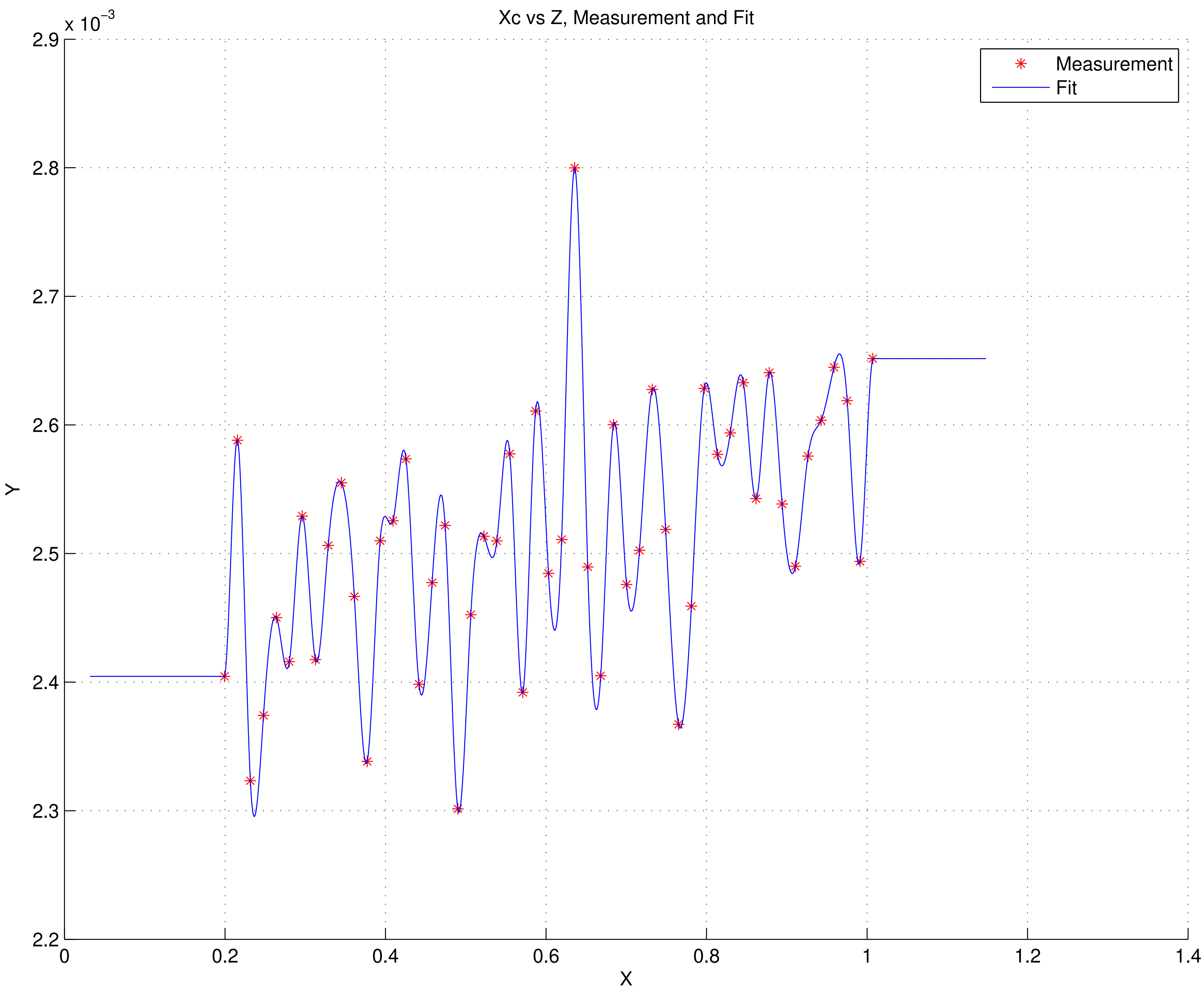


Y Probe, Laser System
x 10$^{-5}$
4
2
0
−2
−4
−6
−8
Y Probe (m)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
Z (m)

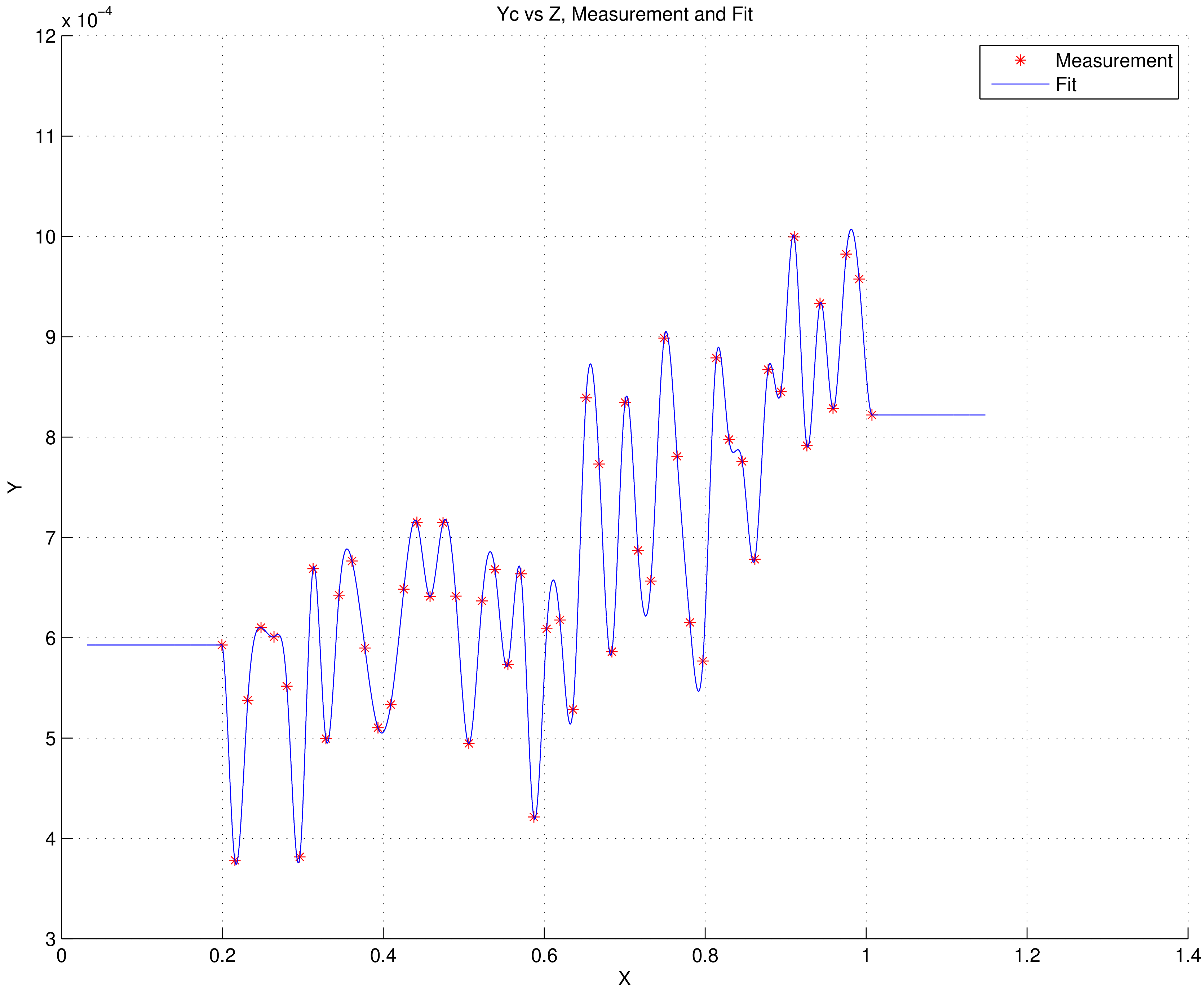

X Center, X Beam Axis, Magnetic Center Rel Measurement Axis
x 10^-3
2.9
2.8
2.7
2.6
2.5
2.4
2.3
X Center, X Beam Axis (m)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
Z (m)



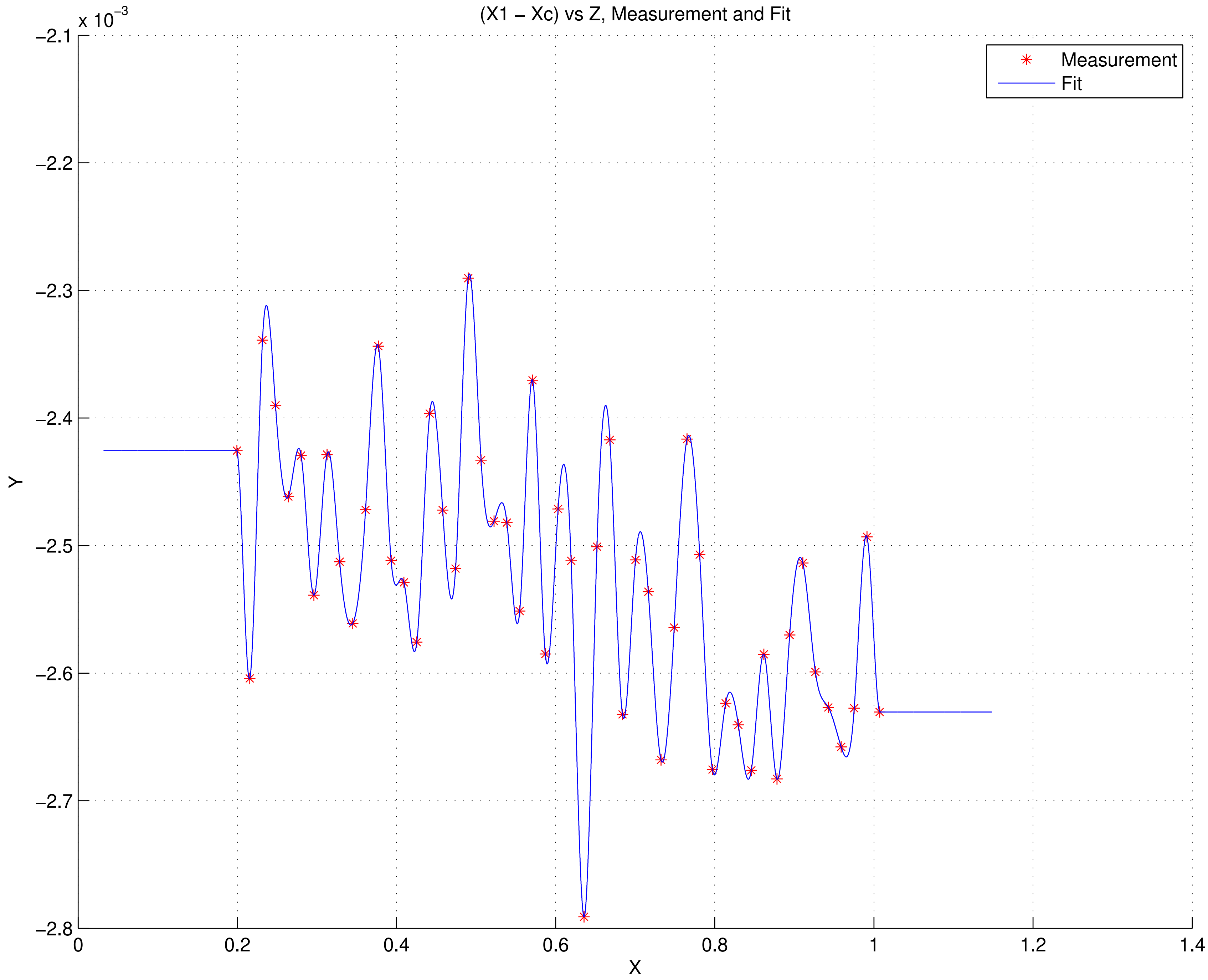
Y Center, Y Beam Axis, Magnetic Center Rel Measurement Axis
x 10^-4
11
10
9
8
7
6
5
4
3
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
Y Center, Y Beam Axis (m)
Z (m)



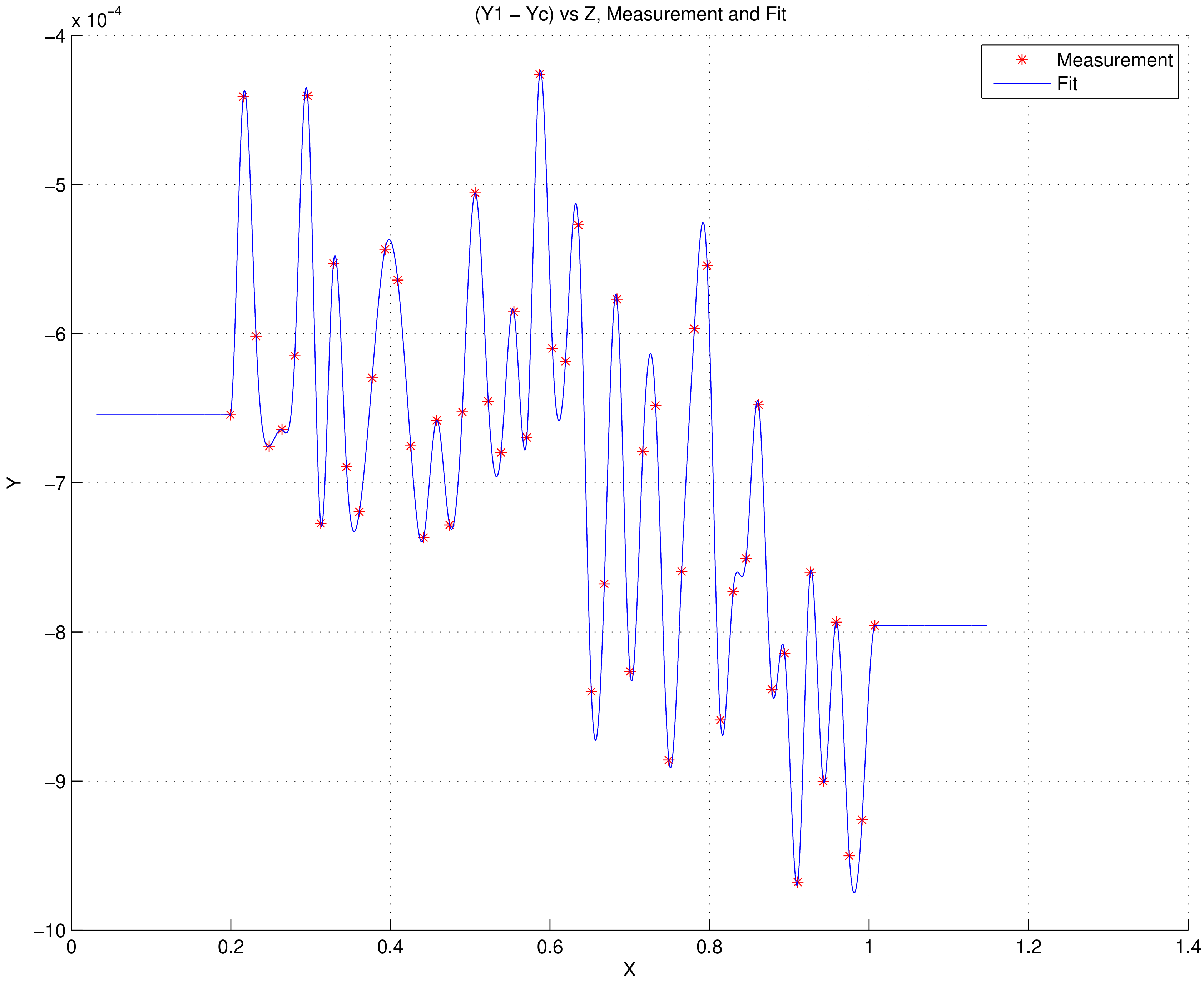
Xc vs Z, Measurement and Fit
x 10^-3
2.9
2.8
2.7
2.6
2.5
2.4
2.3
2.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
X
Y
Measurement
Fit



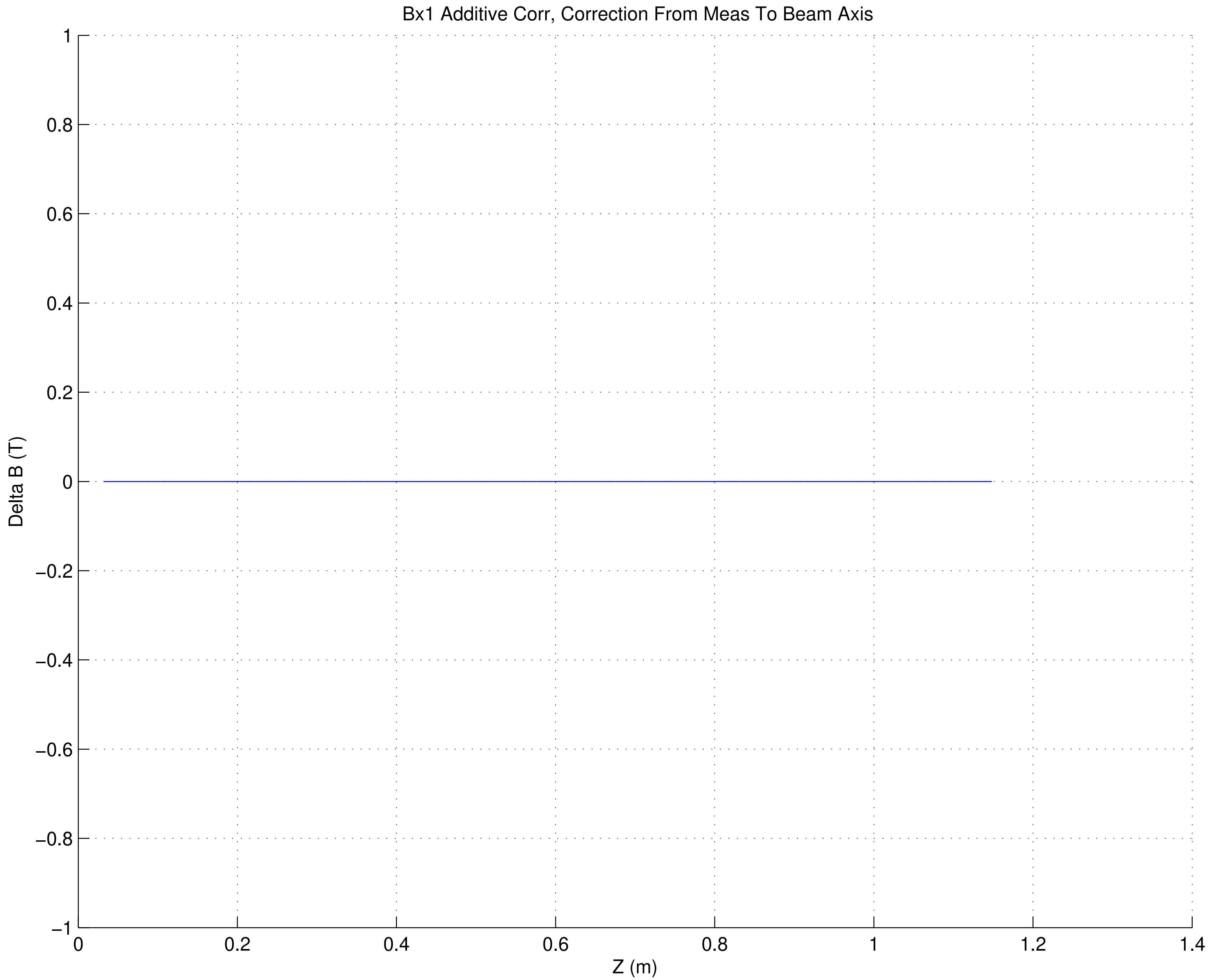
Yc vs Z, Measurement and Fit
x 10^−4
12
11
10
9
8
7
6
5
4
3
Y
0
0.2
0.4
0.6
0.8
1
1.2
1.4
X
Measurement
Fit

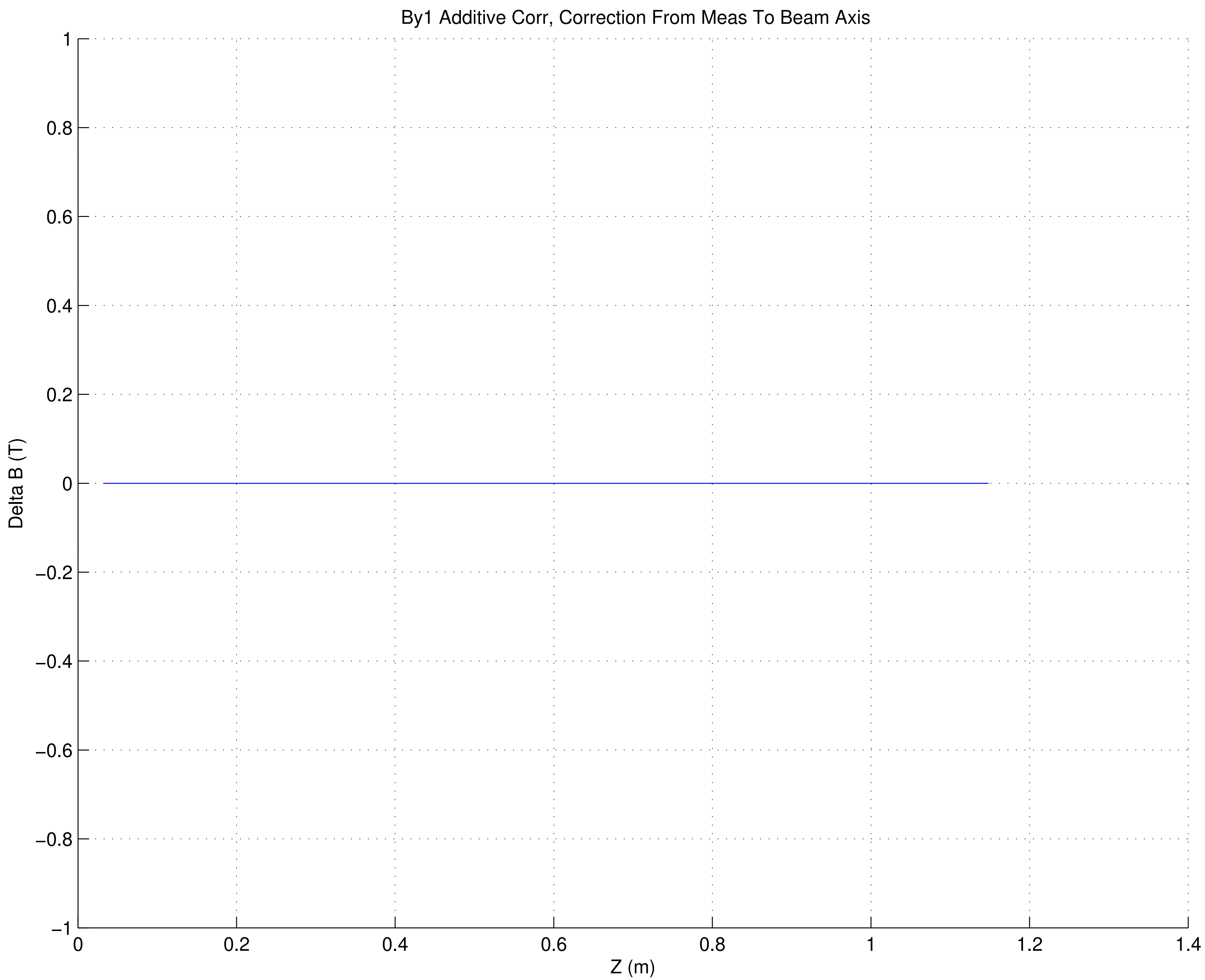


(X1 − Xc) vs Z, Measurement and Fit
x 10^−3
−2.1
−2.2
−2.3
−2.4
−2.5
−2.6
−2.7
−2.8
Y
0
0.2
0.4
0.6
0.8
1
1.2
1.4
X
Measurement
Fit

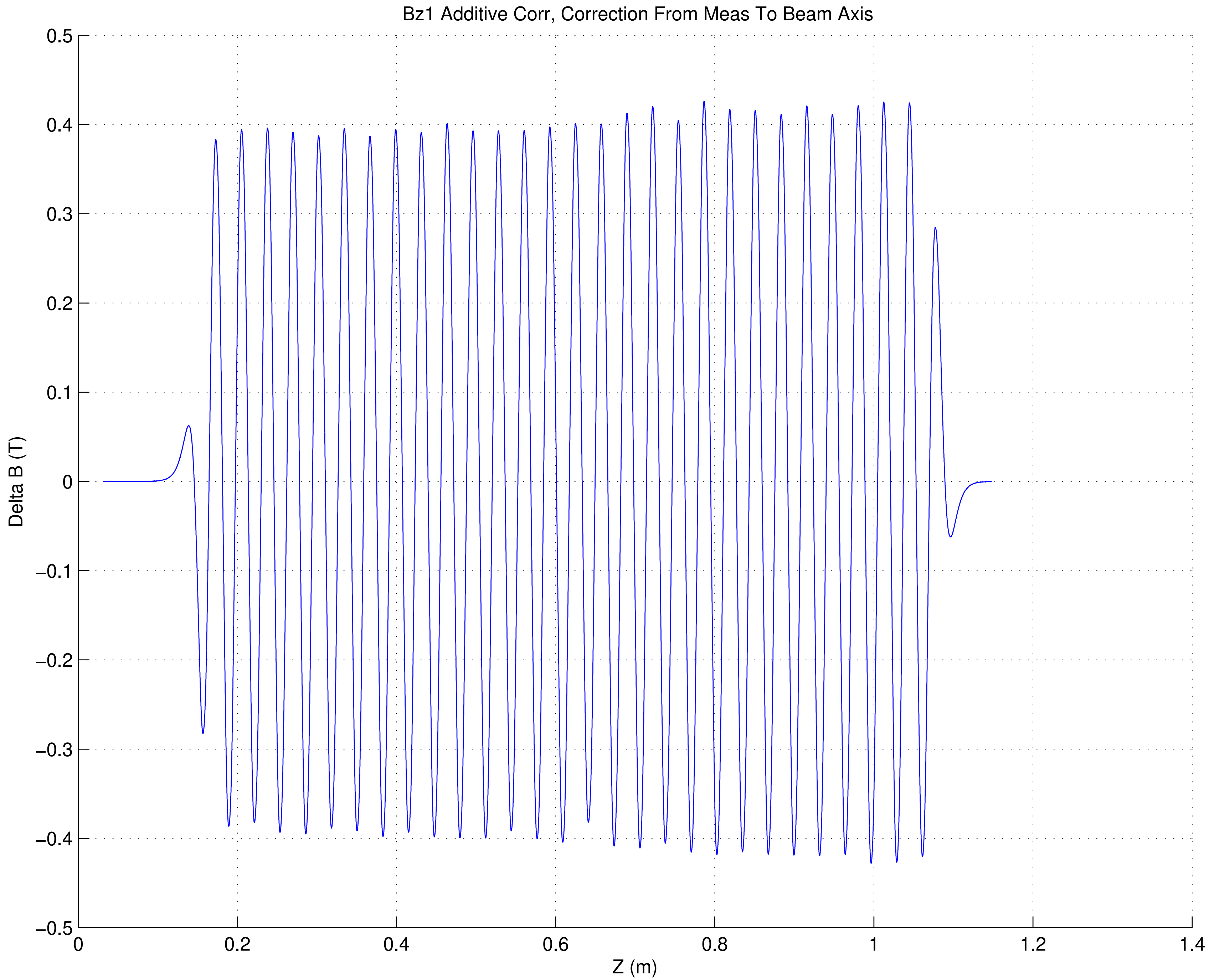


(Y1 − Yc) vs Z, Measurement and Fit
x 10^−4
−4
−5
−6
−7
−8
−9
−10
Y
0
0.2
0.4
0.6
0.8
1
1.2
1.4
X
Measurement
Fit

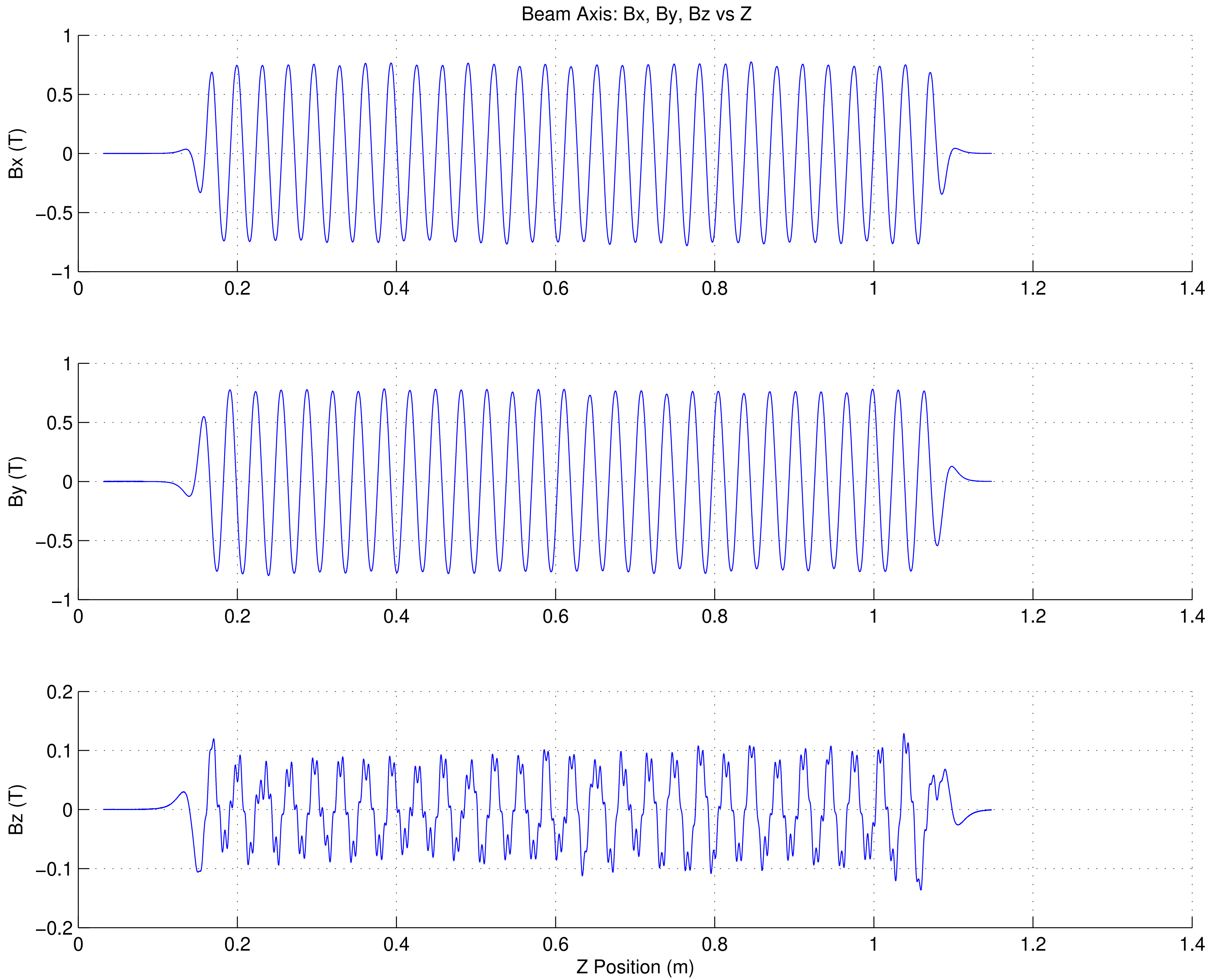

Bx1 Additive Corr, Correction From Meas To Beam Axis
Delta B (T)
Z (m)
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
0
0.2
0.4
0.6
0.8
1
1.2
1.4



By1 Additive Corr, Correction From Meas To Beam Axis
Delta B (T)
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
0
0.2
0.4
0.6
0.8
1
1.2
1.4
Z (m)



Bz1 Additive Corr, Correction From Meas To Beam Axis
Delta B (T)
Z (m)
0.5
0.4
0.3
0.2
0.1
0
−0.1
−0.2
−0.3
−0.4
−0.5
0
0.2
0.4
0.6
0.8
1
1.2
1.4



Beam Axis: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
1
0.5
0
−0.5
−1
0.2
0.1
−0.1
−0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
Z Position (m)