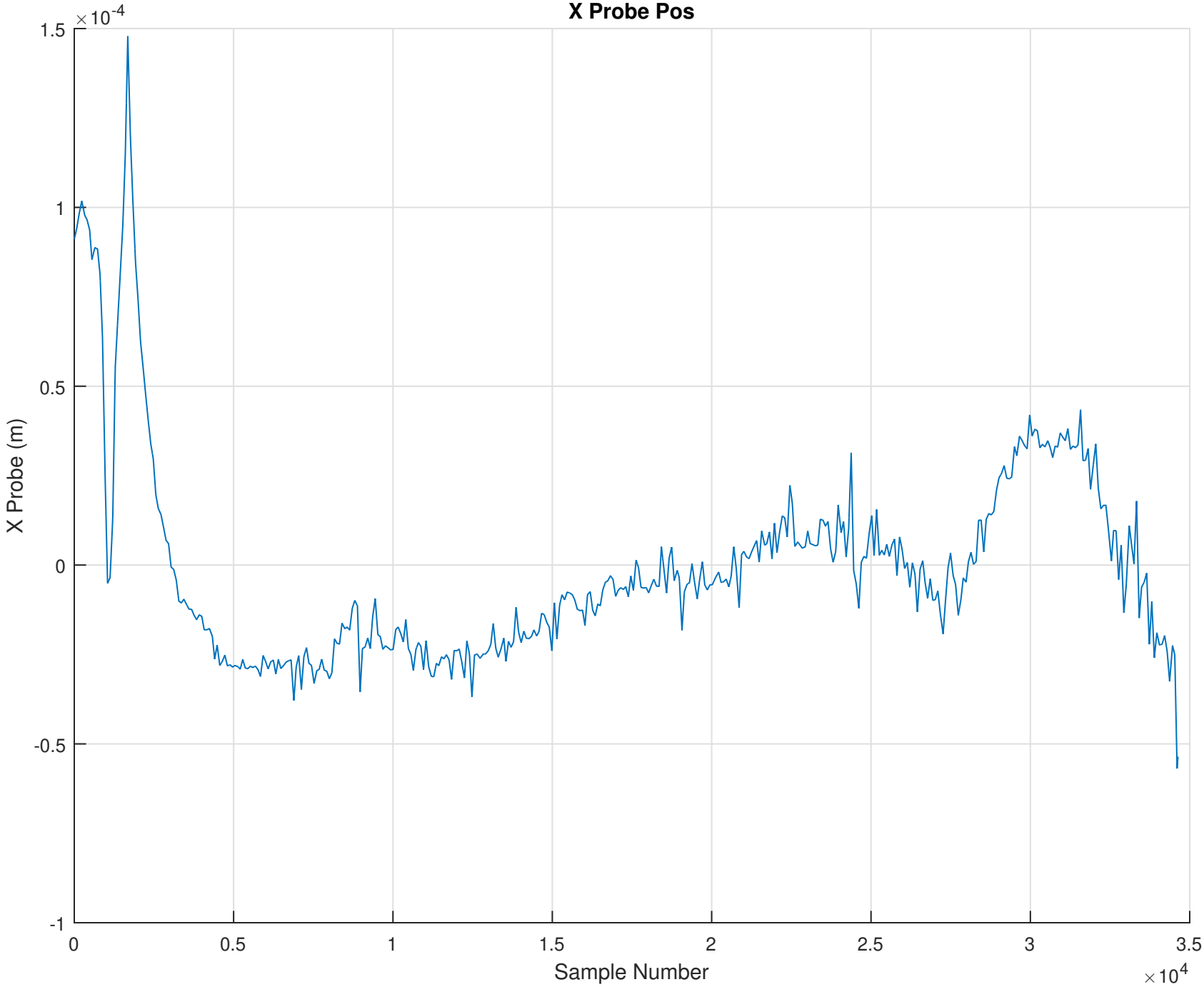
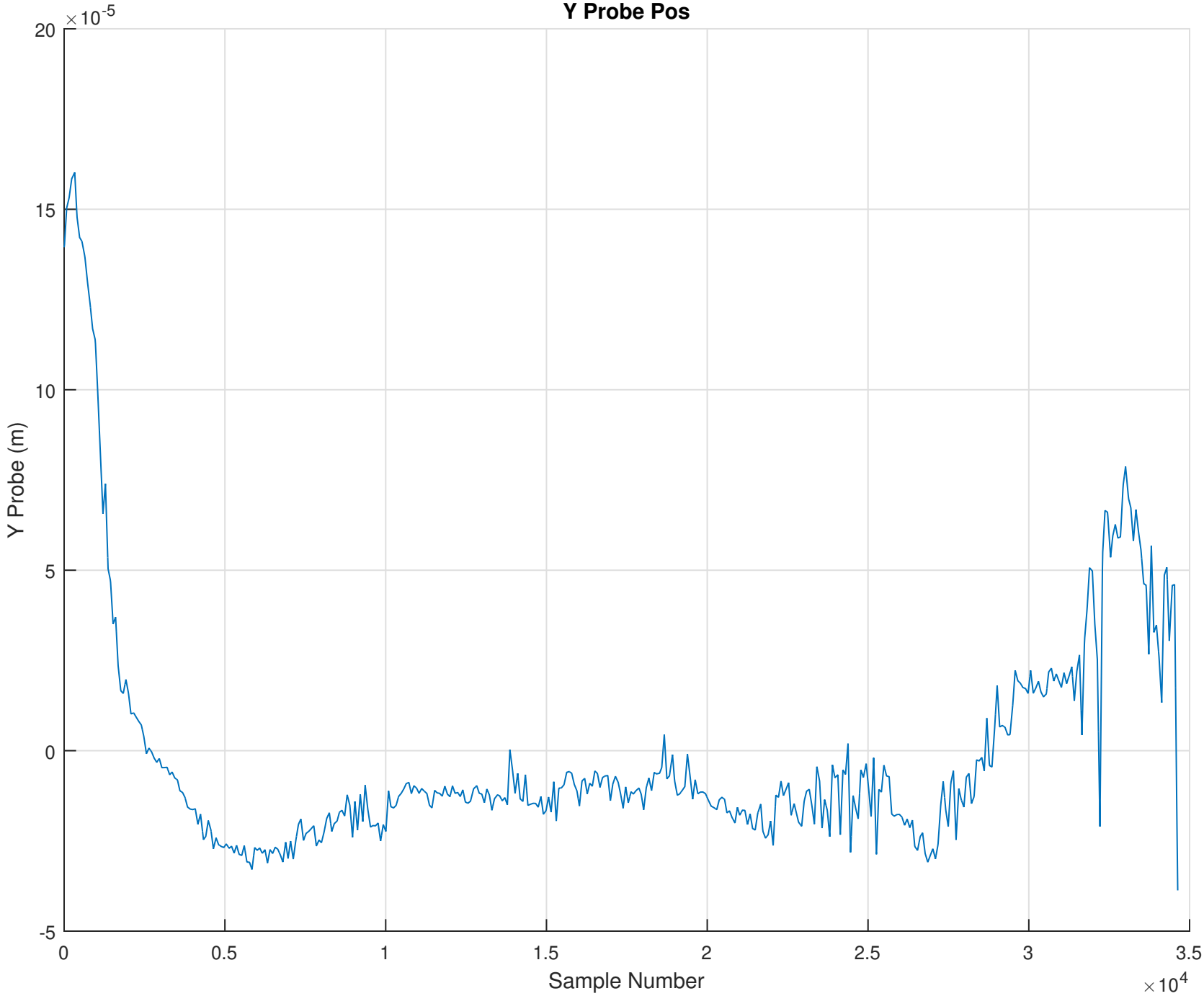
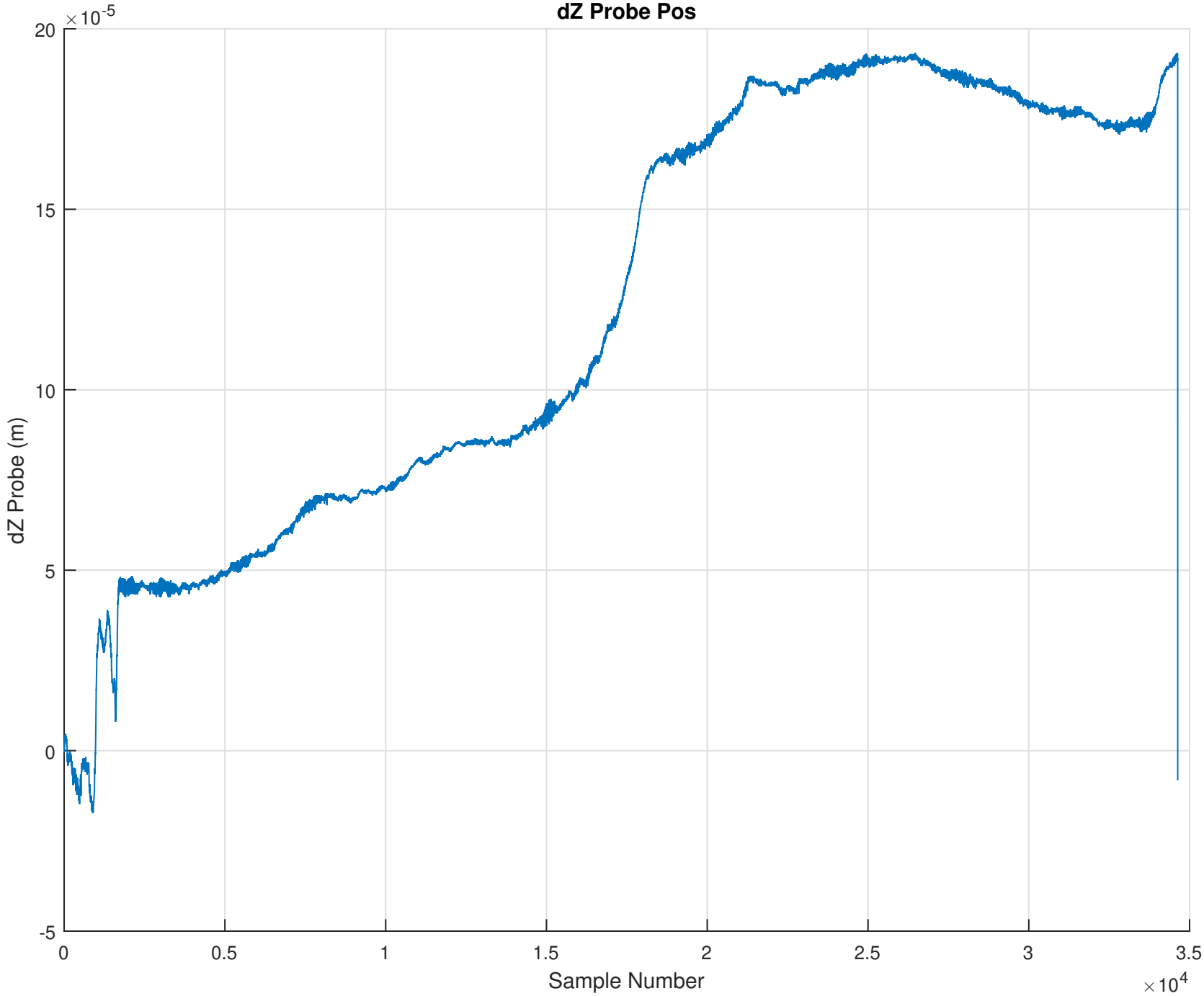
SLAC Magnetic Measurements

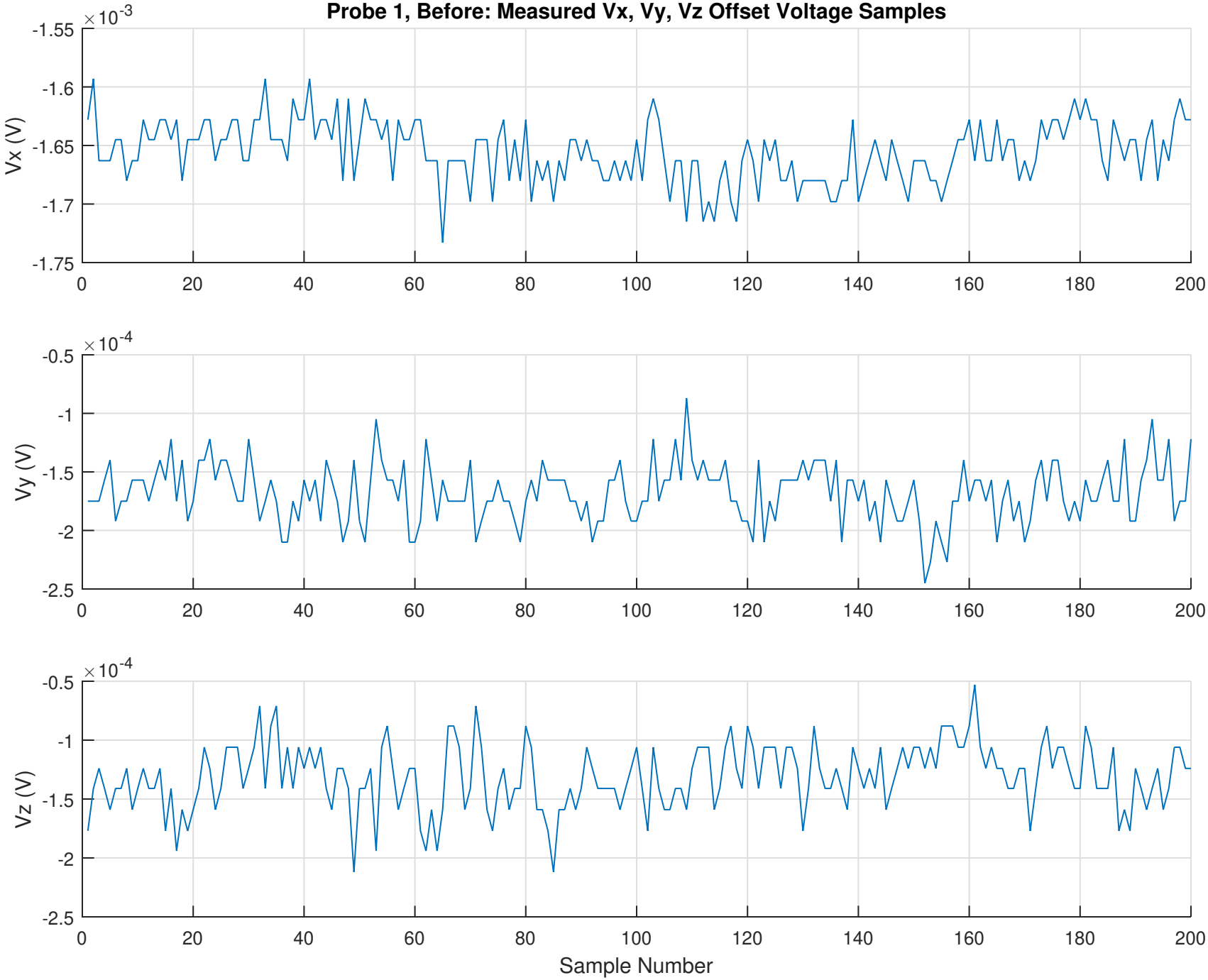
Hall Probe Array Analysis
****

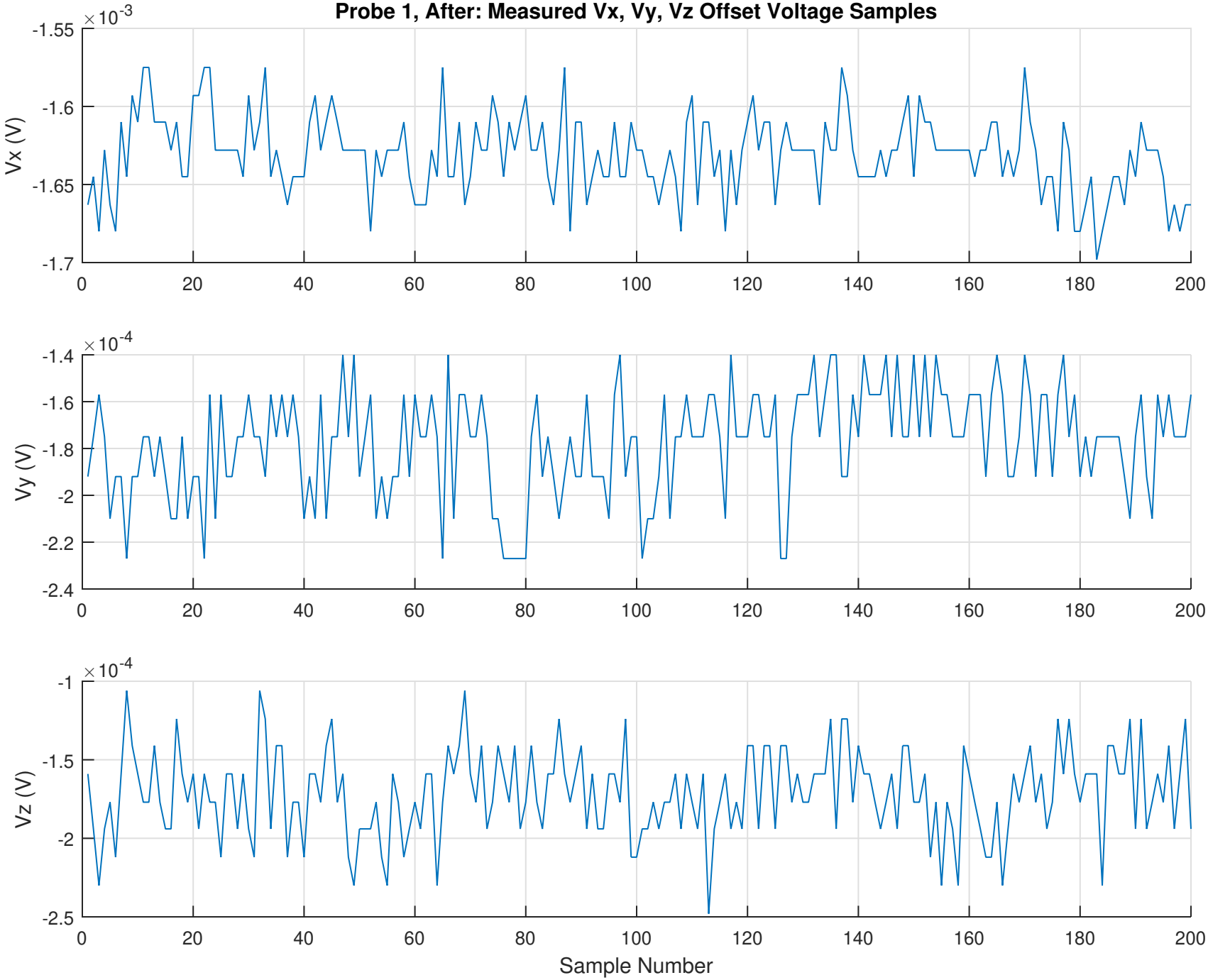
Parameters:
INPUT-FILE-DIR =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Data Set 2 Run 050\CPLMF\K
INPUT-FILE-NAME =DUTestOutput.dat
INPUT-FILE-TYPE =ZVXYZVXYZH
UND-POL-MODE =CIRC-POL-LEFT-HAND
PROBE1-BX-CALIB-FILE =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Yurii Hall Probe Calib
PROBE1-BY-CALIB-FILE =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Yurii Hall Probe Calib
PROBE2-BX-CALIB-FILE =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Yurii Hall Probe Calib
PROBE2-BY-CALIB-FILE =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Yurii Hall Probe Calib
NUM-ZERO-GAUSS-MEAS =200
PROBE2-OFFSET-DIR =Y

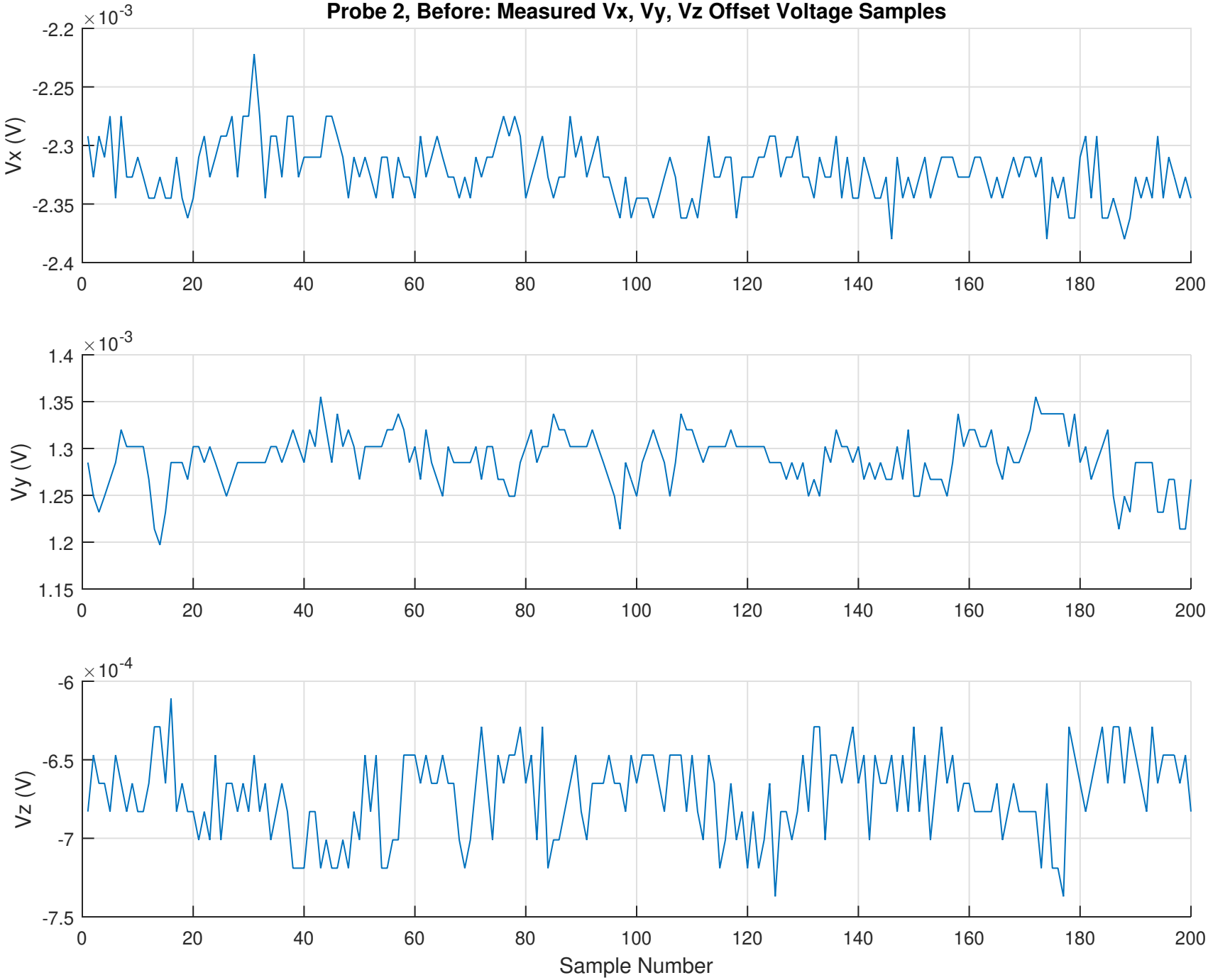

X Probe Pos
×10-4
1.5
1
0.5
0
-0.5
-1
X Probe (m)
0
0.5
1
1.5
2
2.5
3
3.5
Sample Number
×10^4

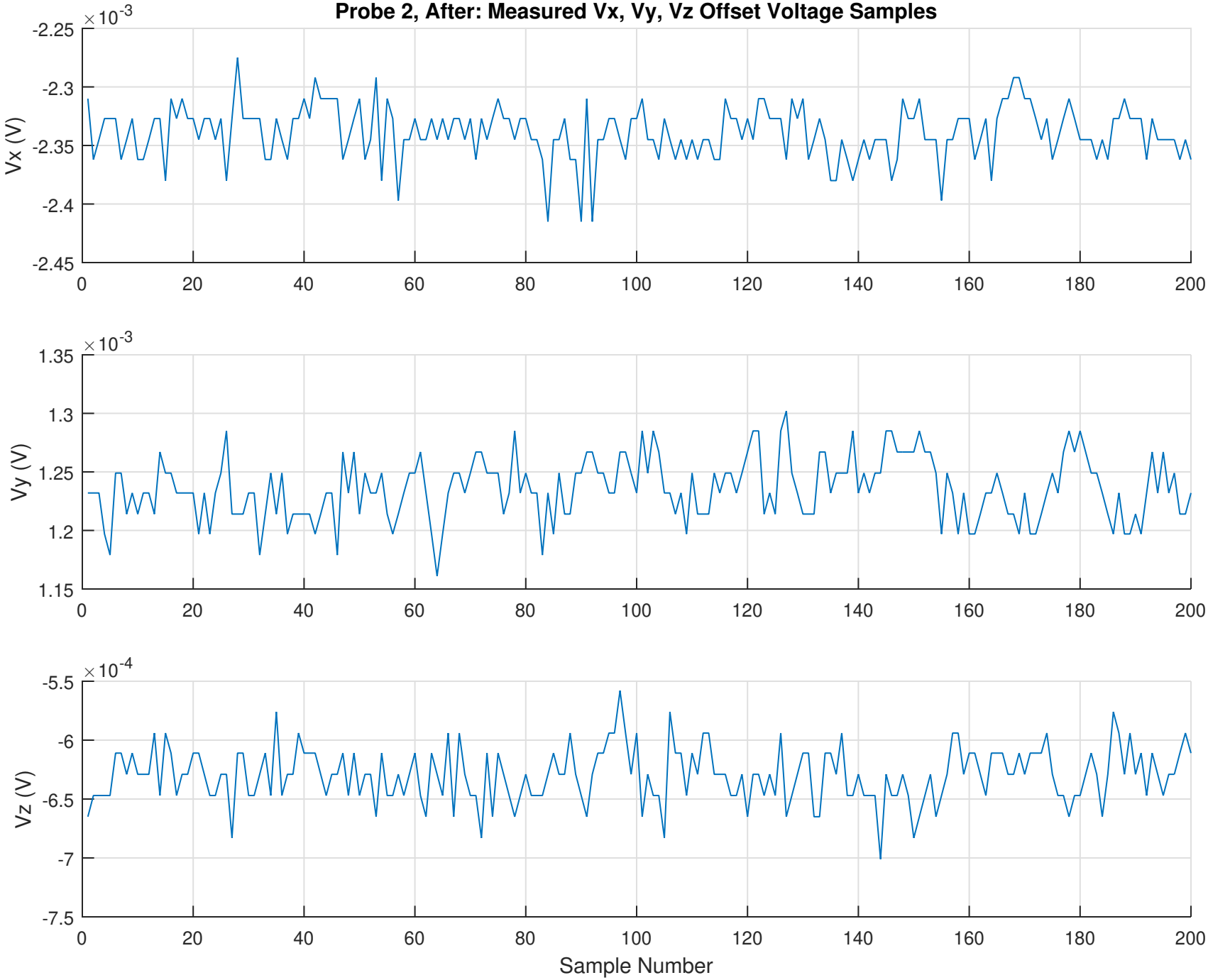

Y Probe Pos
×10-5
20
15
10
5
0
-5
Y Probe (m)
0
0.5
1
1.5
2
2.5
3
3.5
Sample Number
×10^4

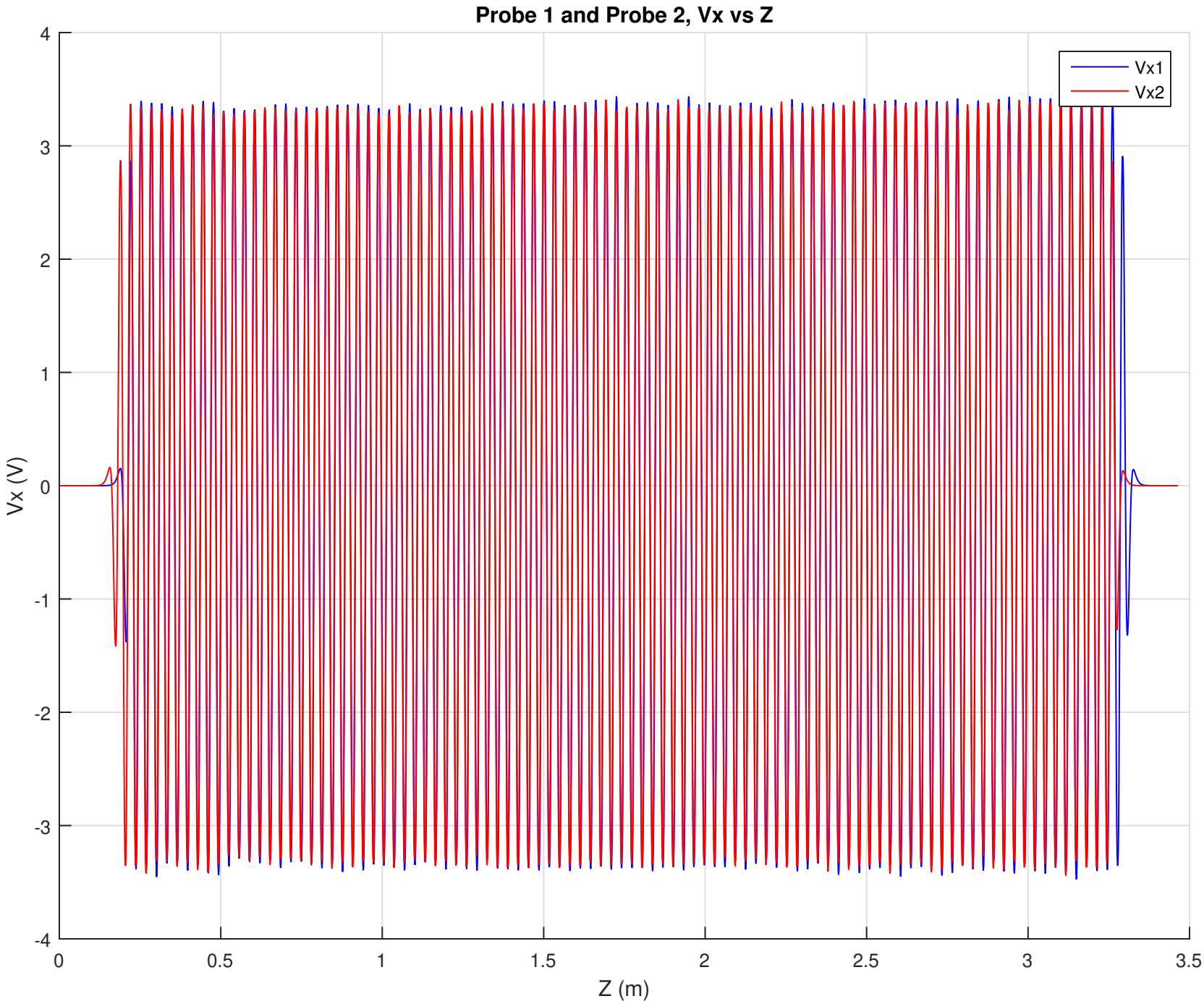

dZ Probe Pos
×10-5
20
15
10
5
0
-5
dZ Probe (m)
0
0.5
1
1.5
2
2.5
3
3.5
Sample Number
×10^4

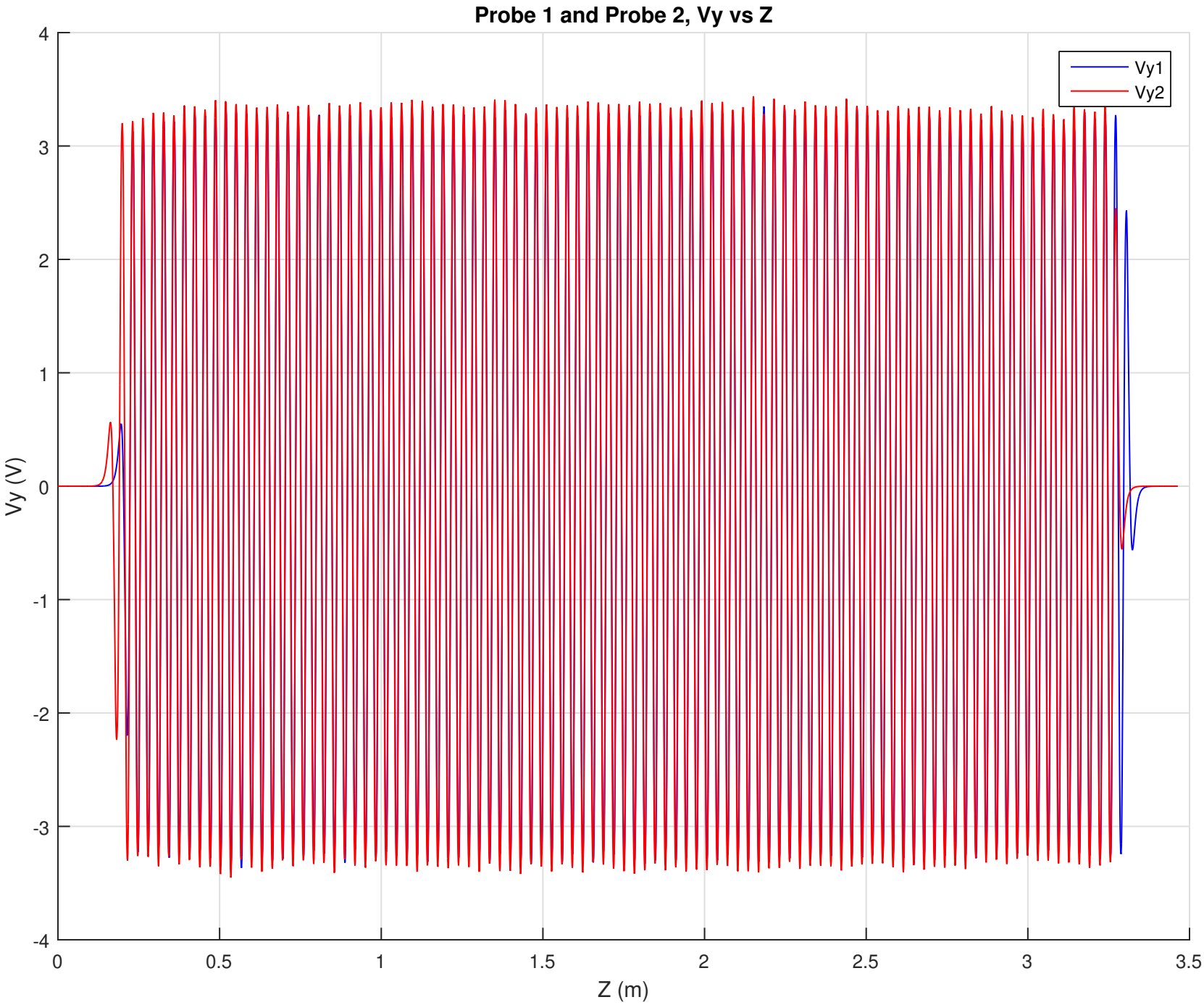

Probe 1, Before: Measured Vx, Vy, Vz Offset Voltage Samples
×10-3
-1.55
-1.6
-1.65
-1.7
-1.75
Vx (V)
×10-4
-0.5
-1
-1.5
-2
-2.5
Vy (V)
×10-4
-0.5
-1
-1.5
-2
-2.5
Vz (V)
0
20
40
60
80
100
120
140
160
180
200
Sample Number

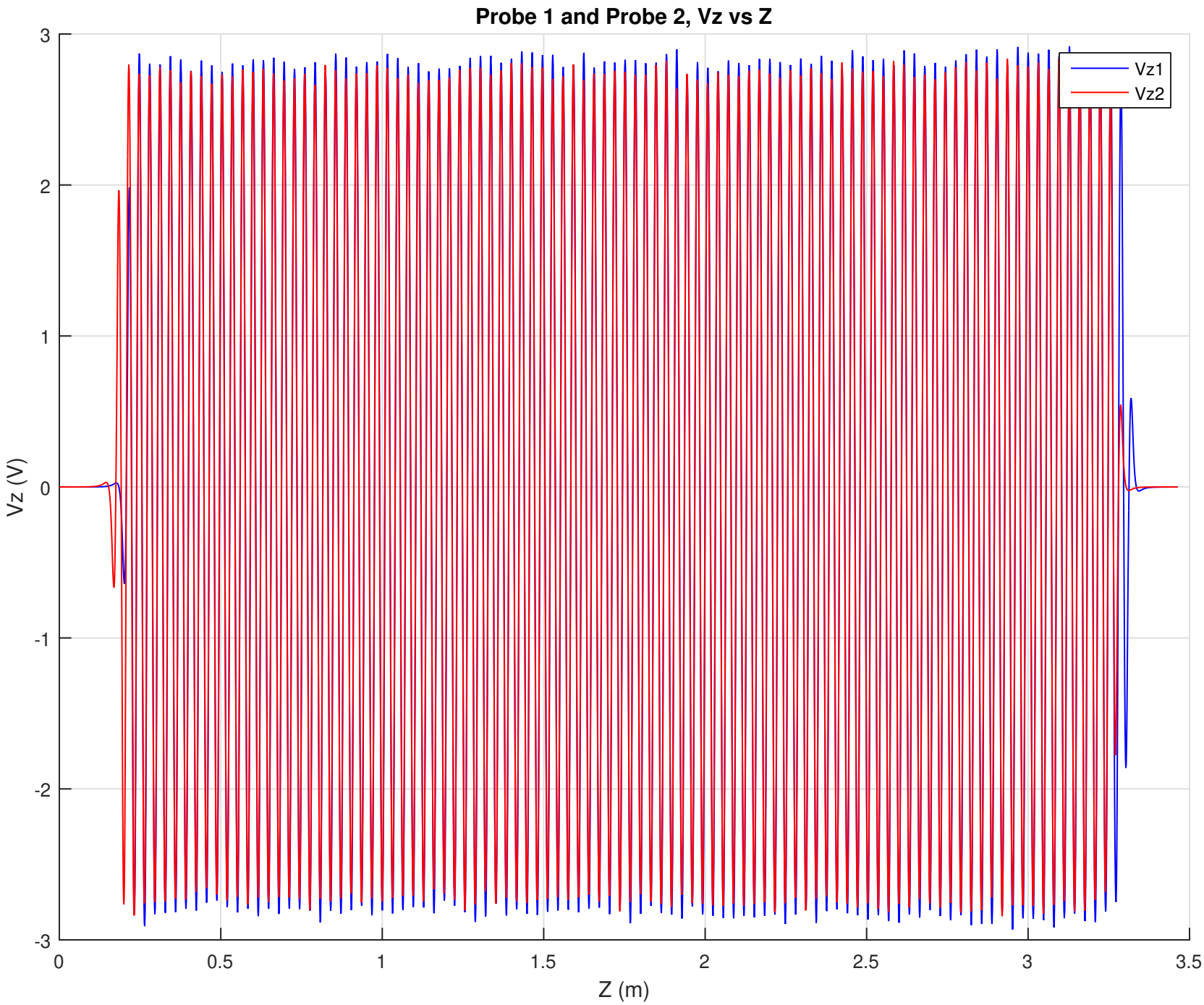

Probe 1, After: Measured Vx, Vy, Vz Offset Voltage Samples
×10^-3
-1.55
-1.6
-1.65
-1.7
Vx (V)
×10^-4
-1.4
-1.6
-1.8
-2
-2.2
-2.4
Vy (V)
×10^-4
-1
-1.5
-2
-2.5
Vz (V)
0
20
40
60
80
100
120
140
160
180
200
Sample Number

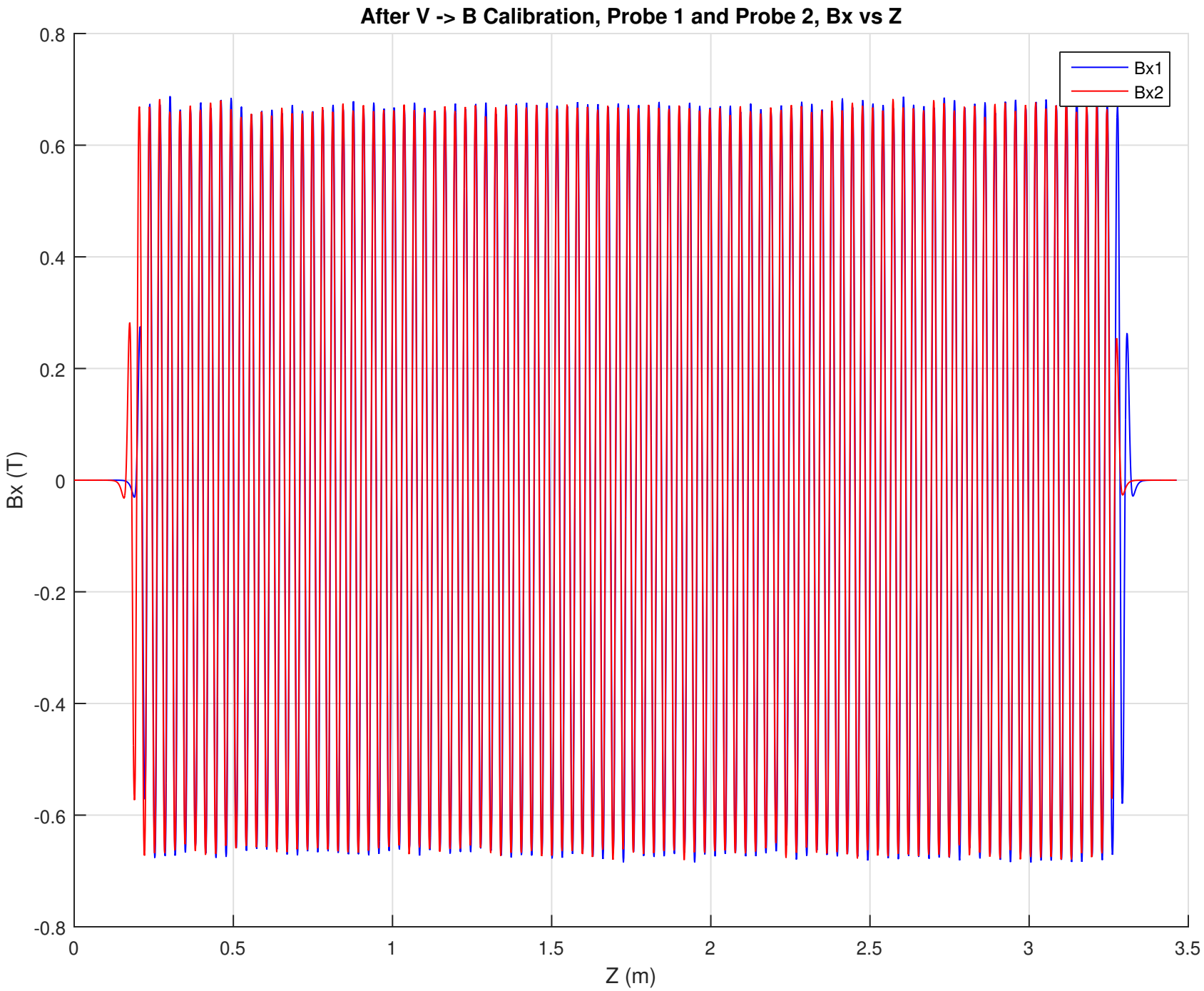

Probe 2, Before: Measured Vx, Vy, Vz Offset Voltage Samples
×10-3
Vx (V)
-2.2
-2.25
-2.3
-2.35
-2.4
×10-3
Vy (V)
1.4
1.35
1.3
1.25
1.2
1.15
×10-4
Vz (V)
-6
-6.5
-7
-7.5
0
20
40
60
80
100
120
140
160
180
200
Sample Number

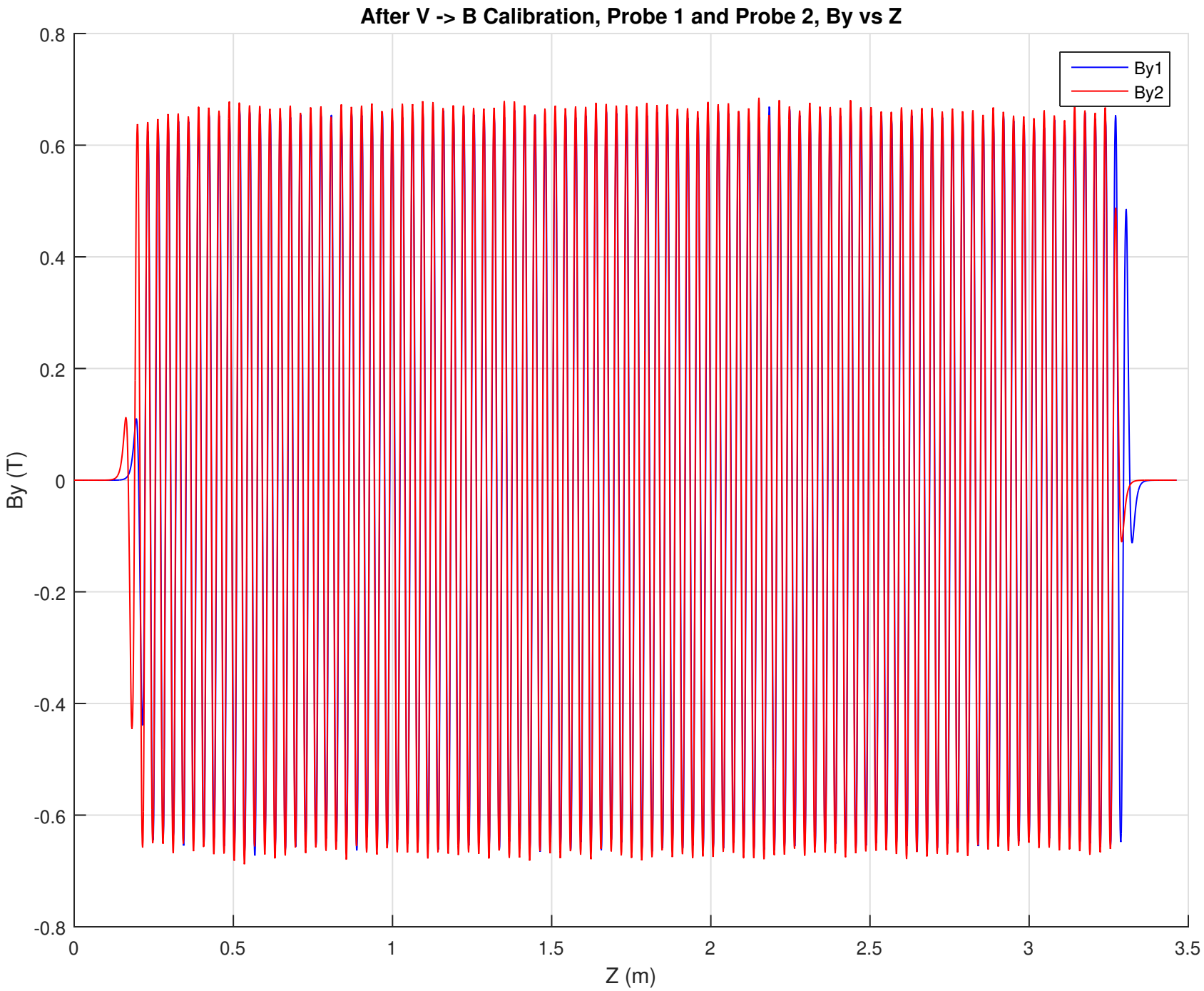

Probe 2, After: Measured Vx, Vy, Vz Offset Voltage Samples
×10^-3
-2.25
-2.3
-2.35
-2.4
-2.45
Vx (V)
0
20
40
60
80
100
120
140
160
180
200
×10^-3
1.35
1.3
1.25
1.2
1.15
Vy (V)
0
20
40
60
80
100
120
140
160
180
200
×10^-4
-5.5
-6
-6.5
-7
-7.5
Vz (V)
0
20
40
60
80
100
120
140
160
180
200
Sample Number

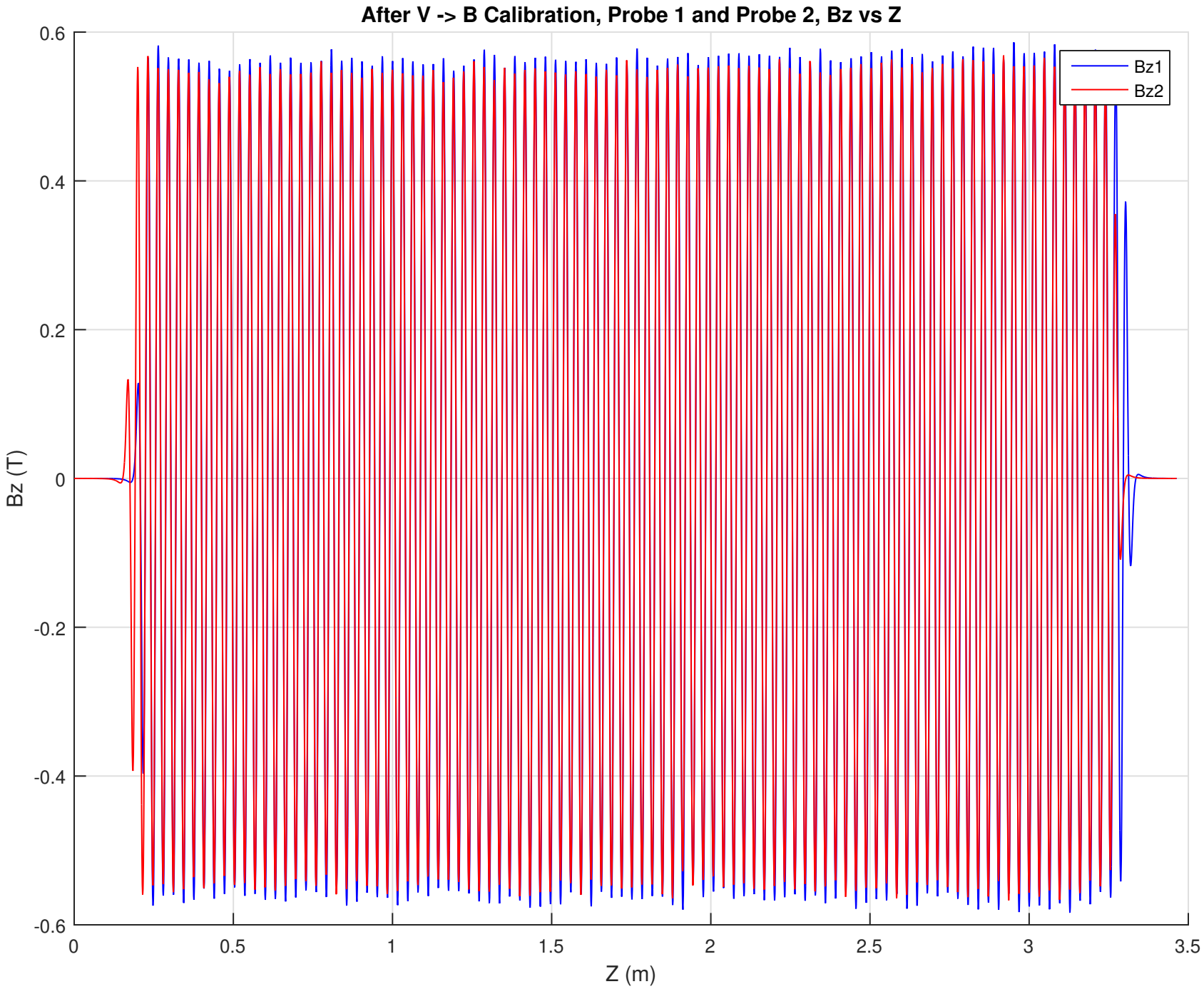

Probe 1 and Probe 2, Vx vs Z
Vx1
Vx2
Vx (V)
Z (m)
4
3
2
1
0
-1
-2
-3
-4
0
0.5
1
1.5
2
2.5
3
3.5

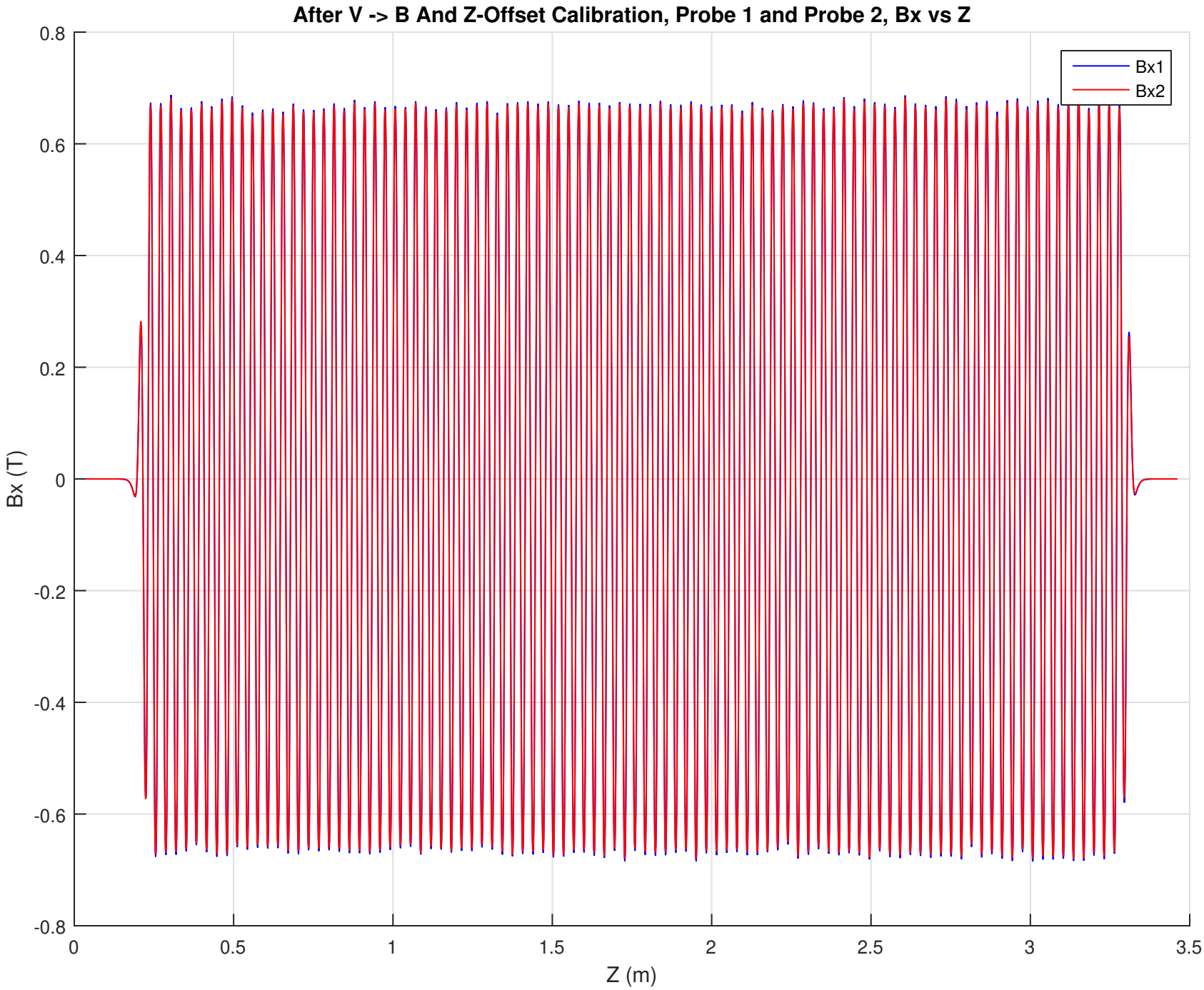

Probe 1 and Probe 2, Vy vs Z
Vy1
Vy2
Vy (V)
Z (m)
4
3
2
1
0
-1
-2
-3
-4
0
0.5
1
1.5
2
2.5
3
3.5

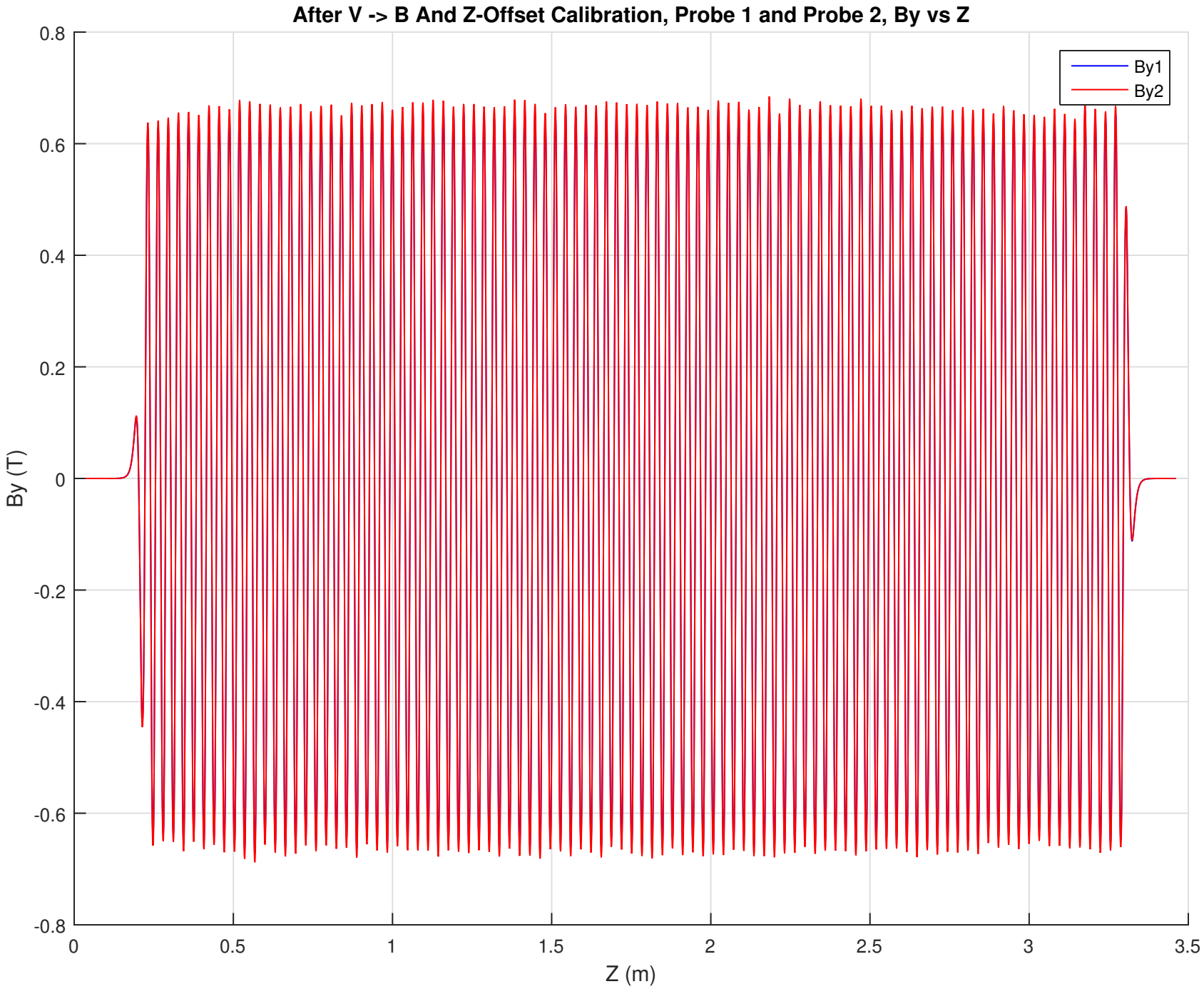

Probe 1 and Probe 2, Vz vs Z
Vz1
Vz2
Vz (V)
Z (m)
3
2
1
0
-1
-2
-3
0
0.5
1
1.5
2
2.5
3
3.5

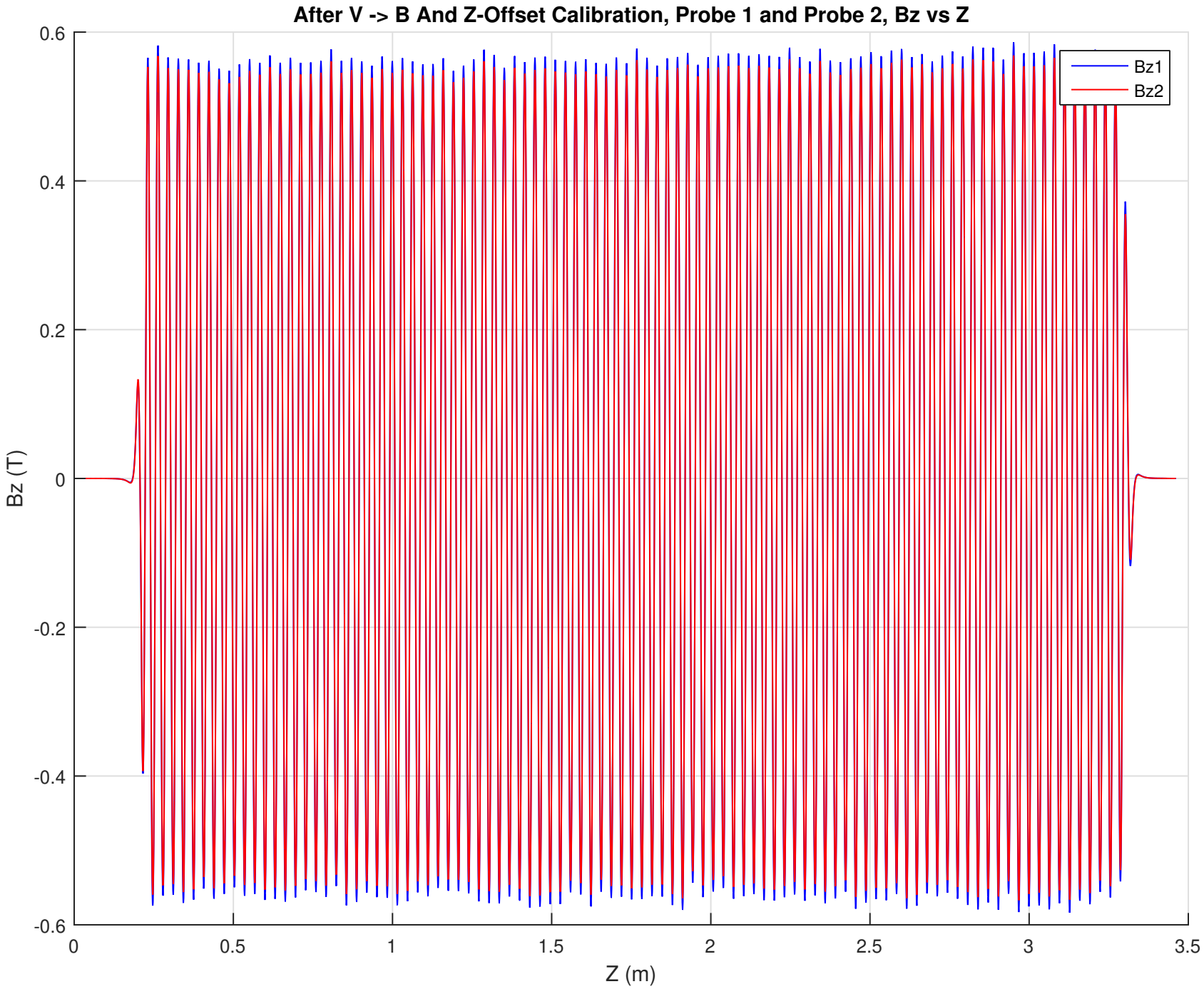

After V -> B Calibration, Probe 1 and Probe 2, Bx vs Z
Bx1
Bx2
Bx (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

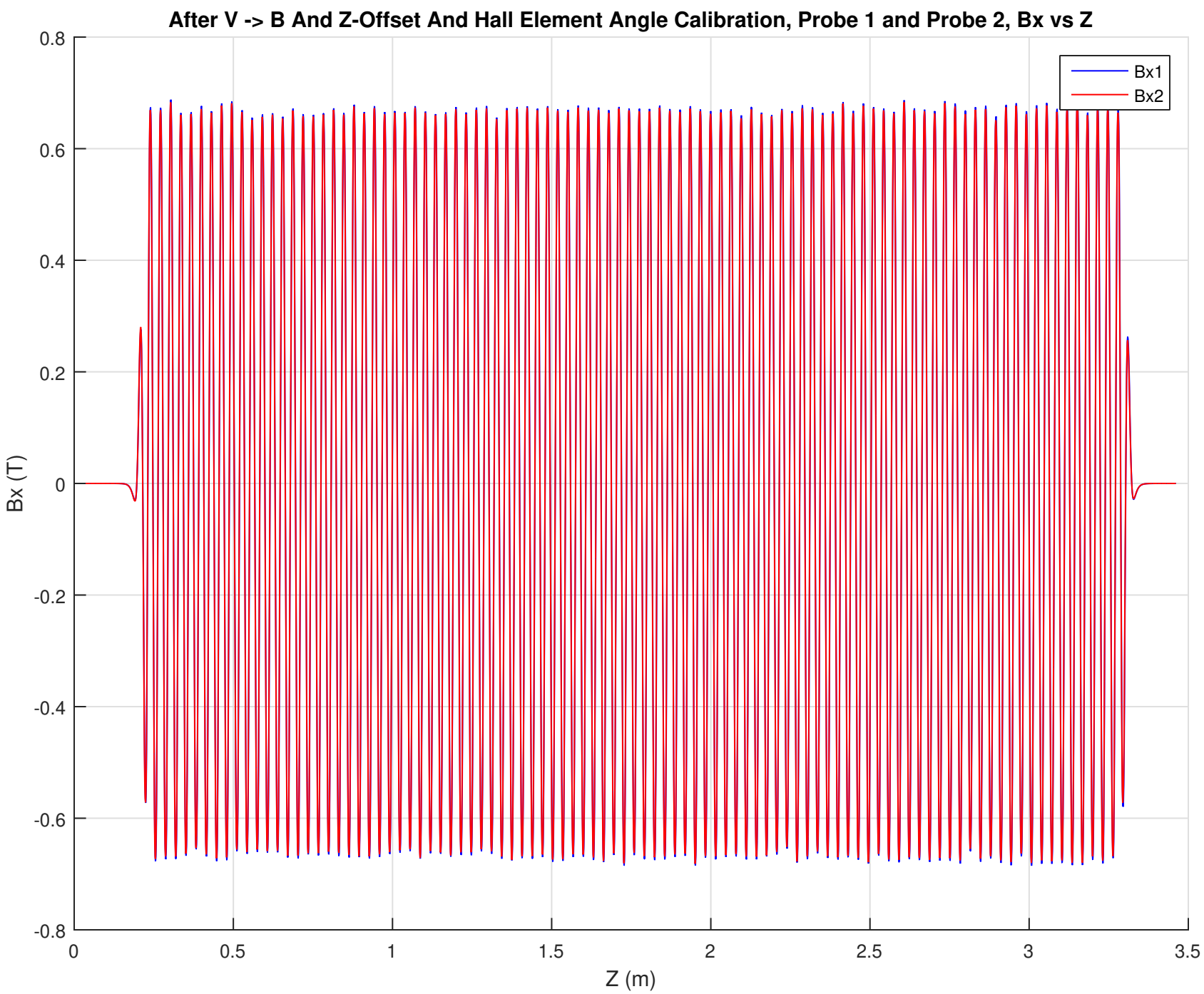

After V -> B Calibration, Probe 1 and Probe 2, By vs Z
By1
By2
By (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

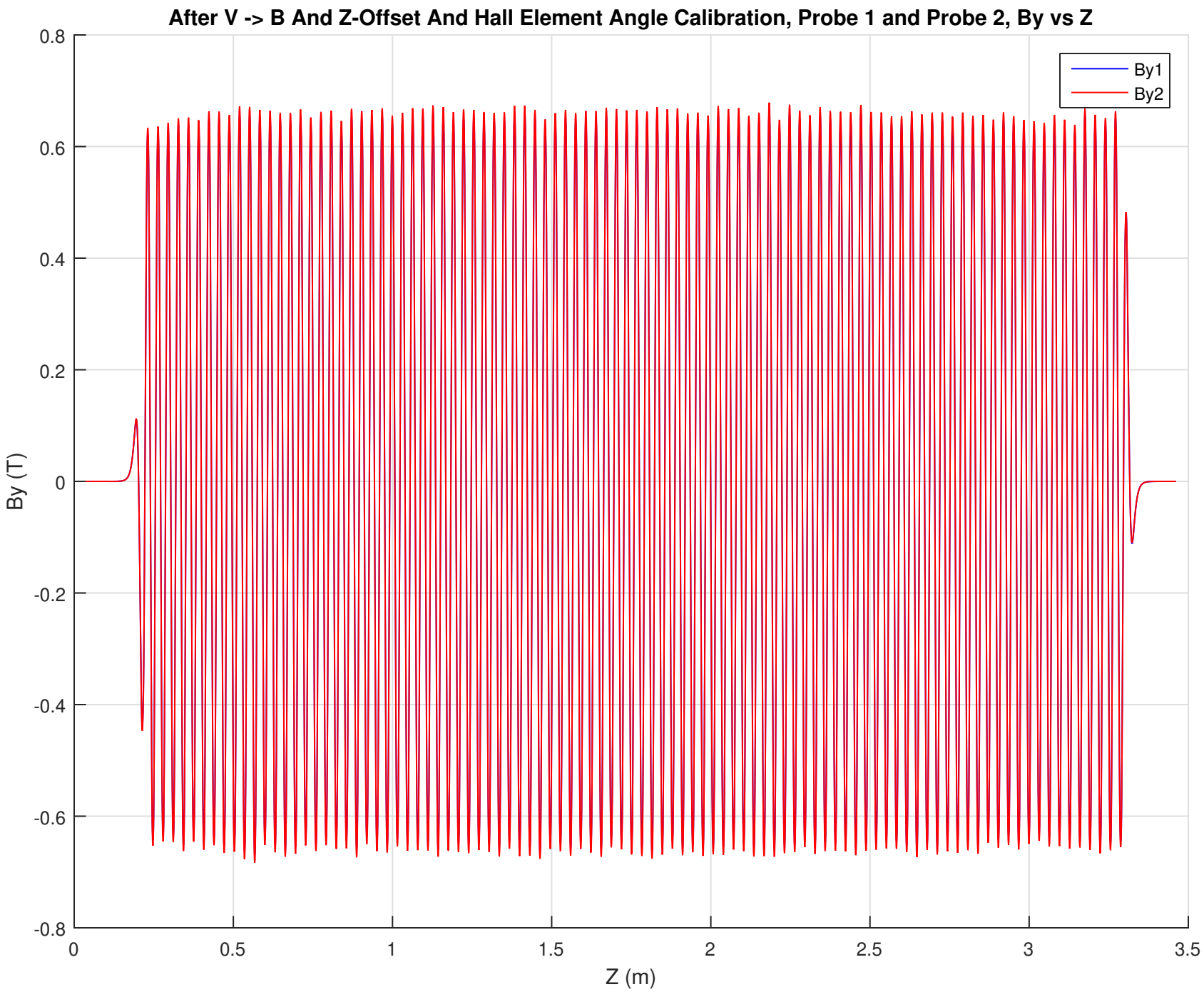

After V -> B Calibration, Probe 1 and Probe 2, Bz vs Z
Bz1
Bz2
Bz (T)
Z (m)
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0
0.5
1
1.5
2
2.5
3
3.5


After V -> B And Z-Offset Calibration, Probe 1 and Probe 2, Bx vs Z
Bx1
Bx2
Bx (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

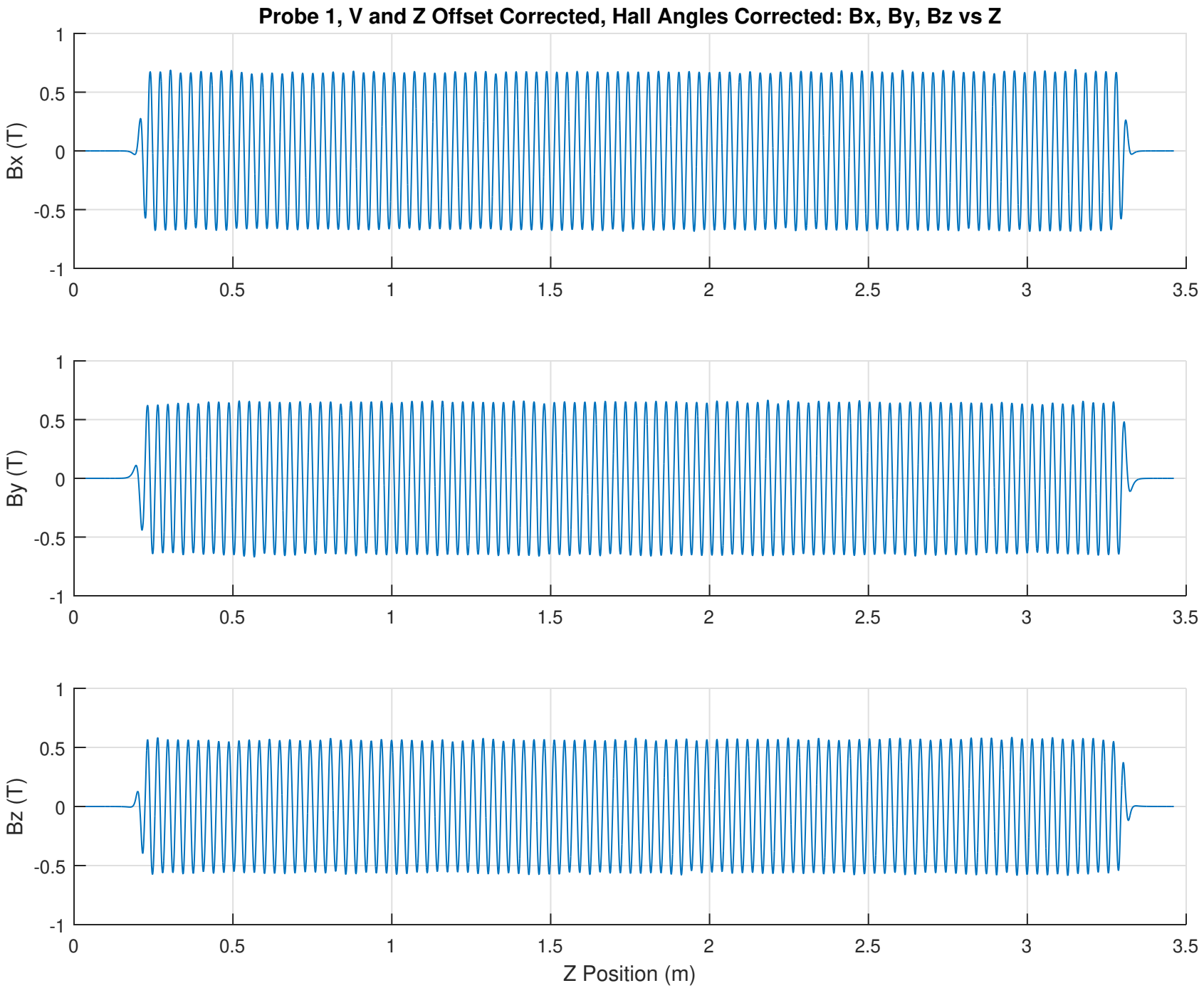

After V -> B And Z-Offset Calibration, Probe 1 and Probe 2, By vs Z
By1
By2
By (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

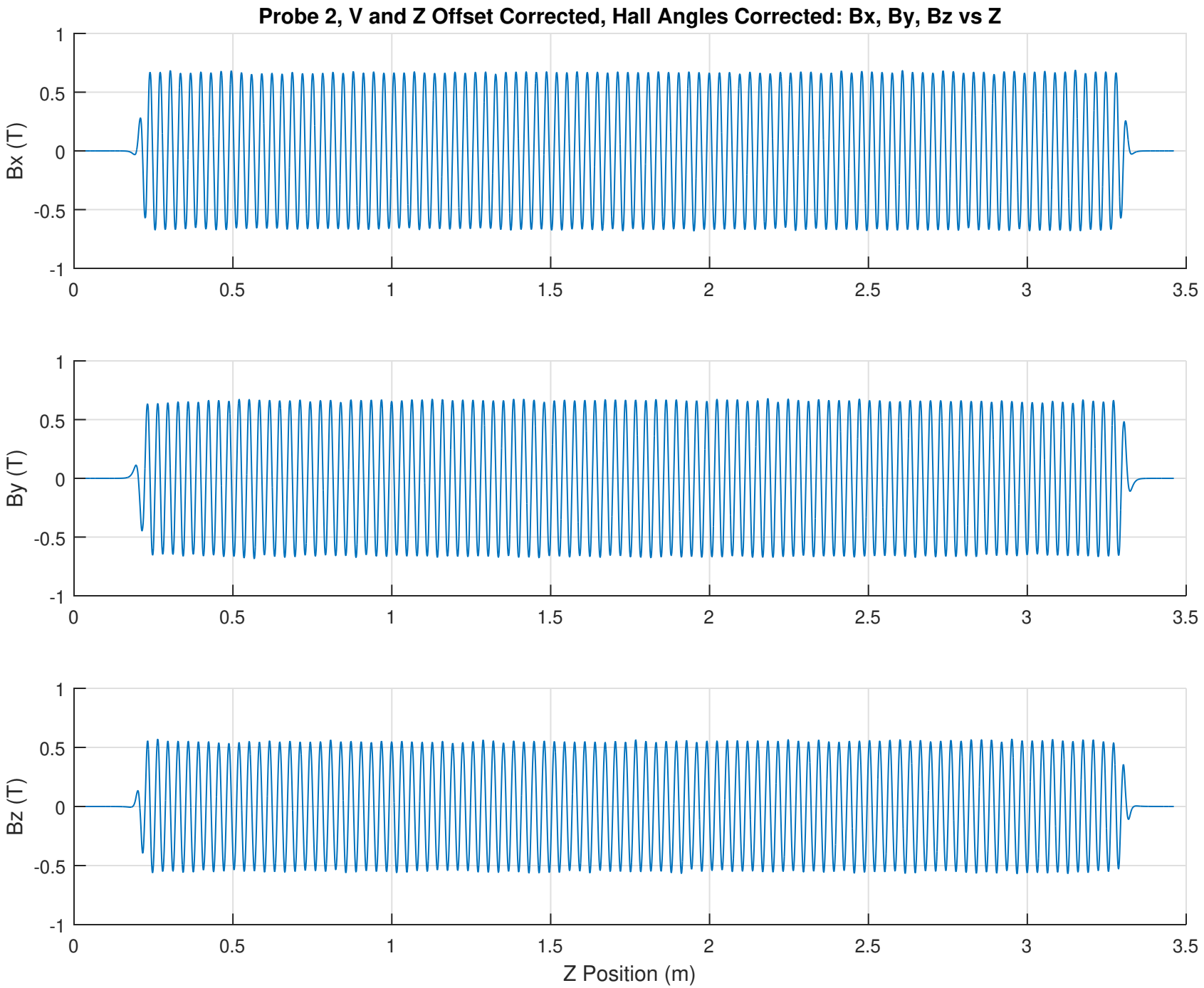

After V -> B And Z-Offset Calibration, Probe 1 and Probe 2, Bz vs Z
Bz1
Bz2
Bz (T)
Z (m)
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0
0.5
1
1.5
2
2.5
3
3.5

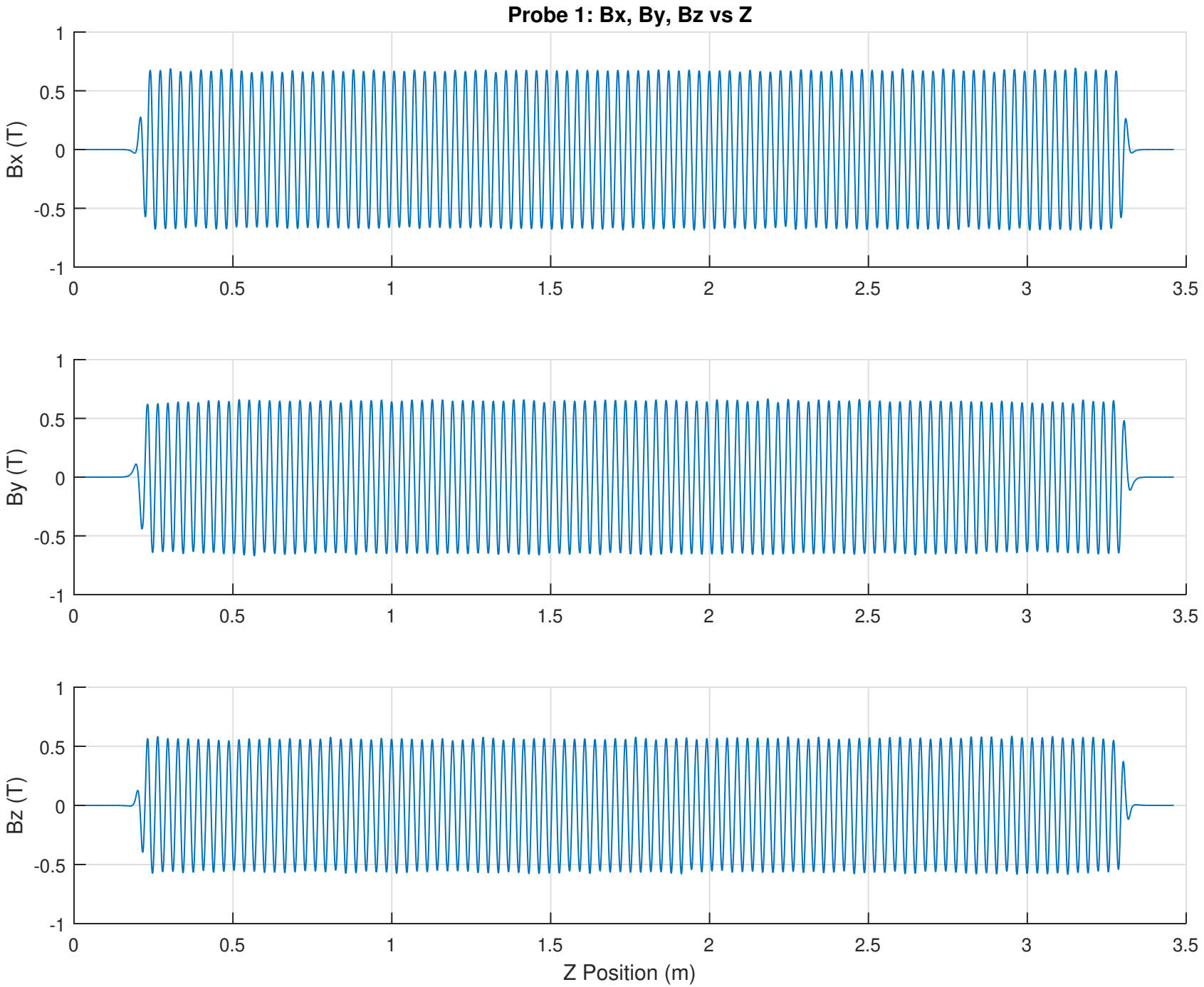

After V -> B And Z-Offset And Hall Element Angle Calibration, Probe 1 and Probe 2, Bx vs Z
Bx1
Bx2
Bx (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

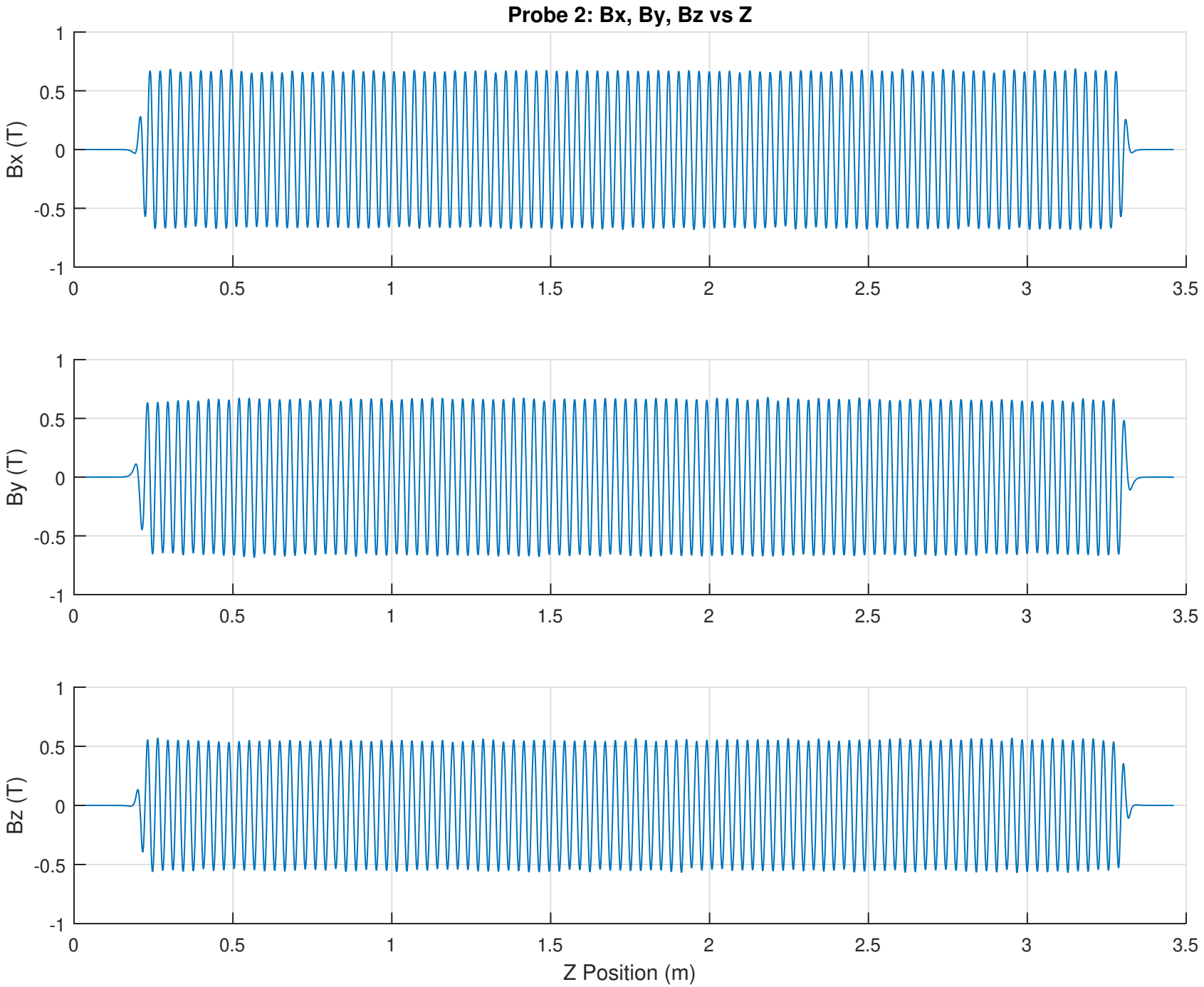

After V -> B And Z-Offset And Hall Element Angle Calibration, Probe 1 and Probe 2, By vs Z
By1
By2
By (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

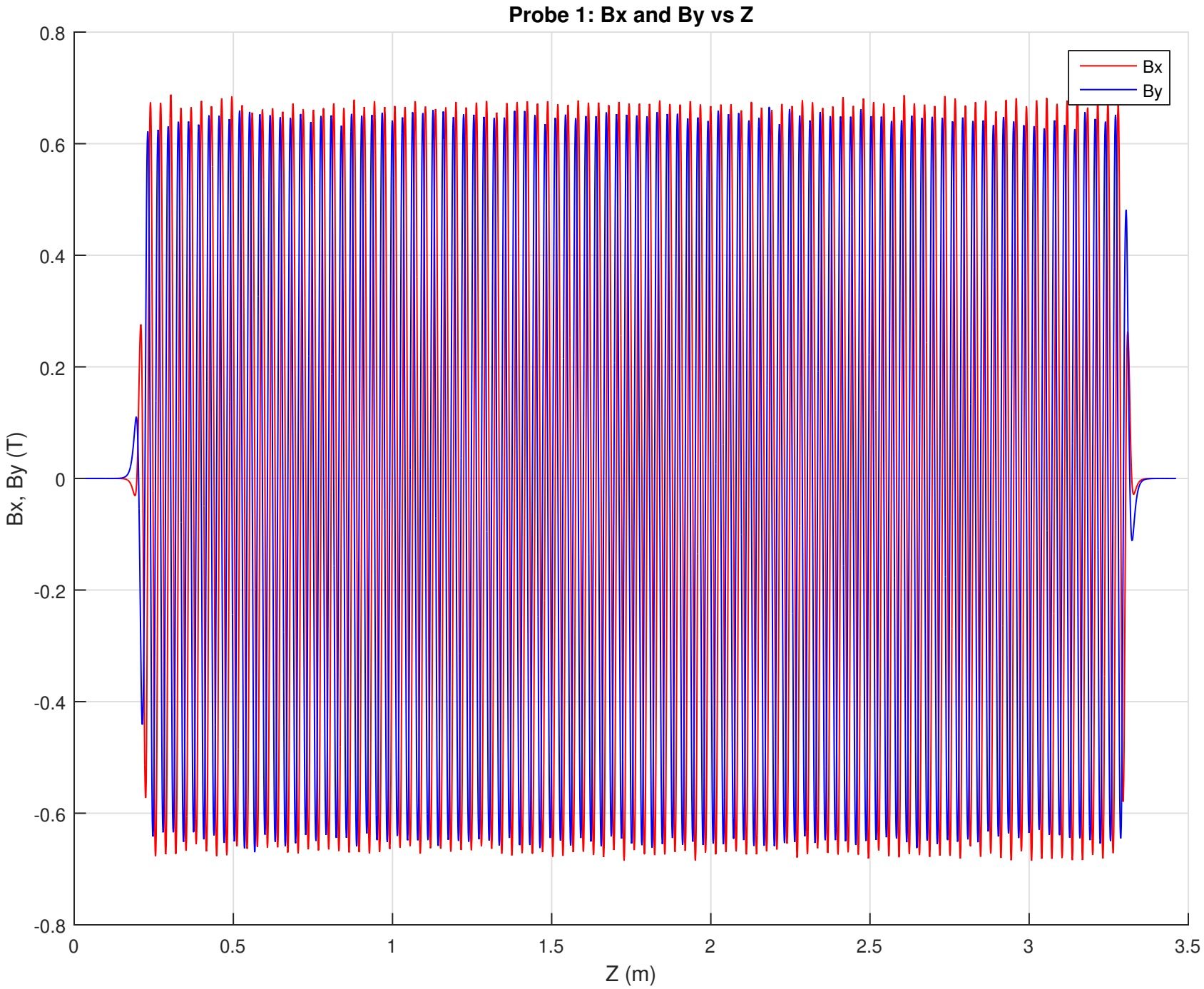
After V -> B And Z-Offset And Hall Element Angle Calibration, Probe 1 and Probe 2, Bz vs Z
Bz1
Bz2
Bz (T)
Z (m)
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0
0.5
1
1.5
2
2.5
3
3.5

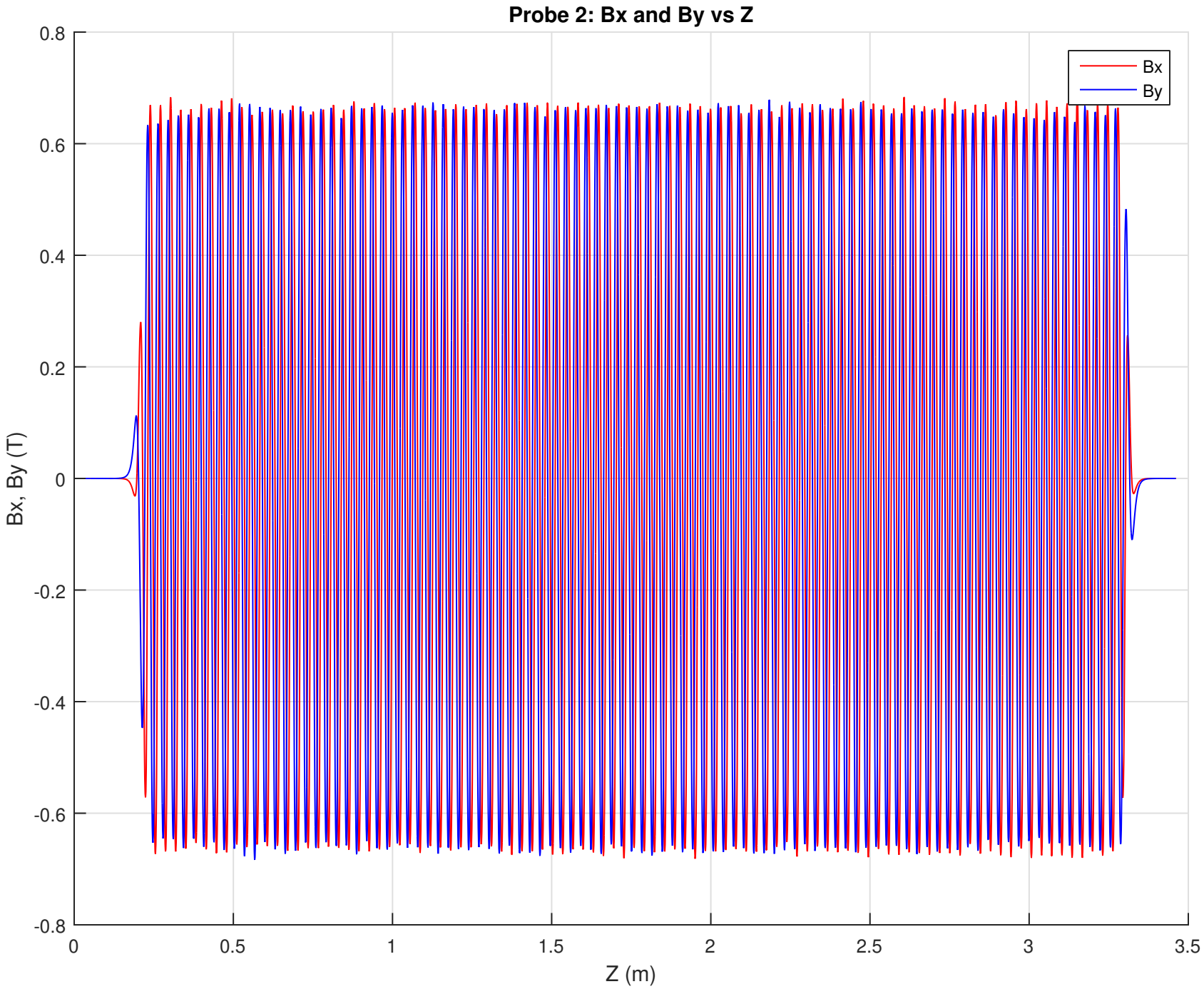

Probe 1, V and Z Offset Corrected, Hall Angles Corrected: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5
Z Position (m)

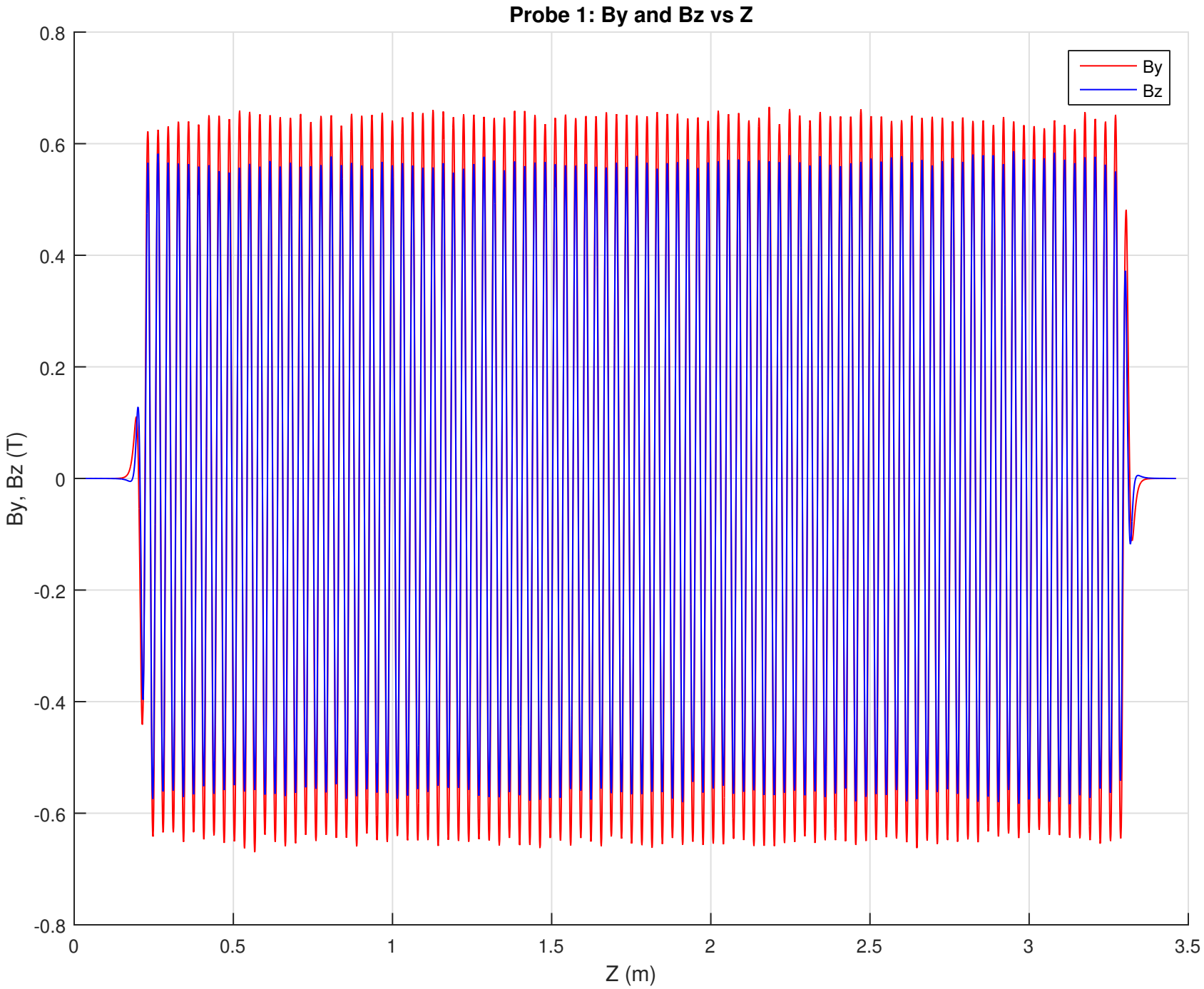

Probe 2, V and Z Offset Corrected, Hall Angles Corrected: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5
Z Position (m)

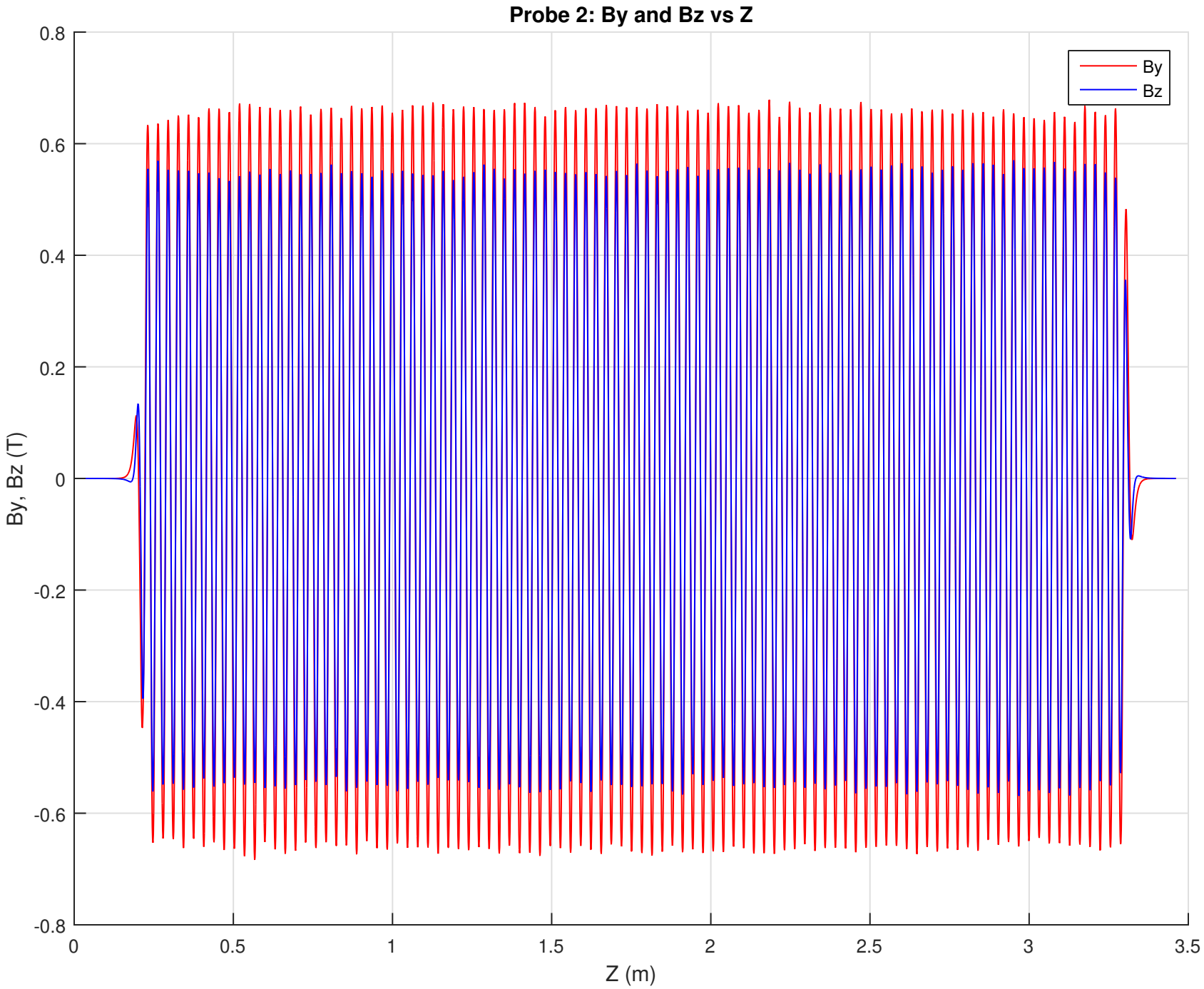

Probe 1: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5
Z Position (m)

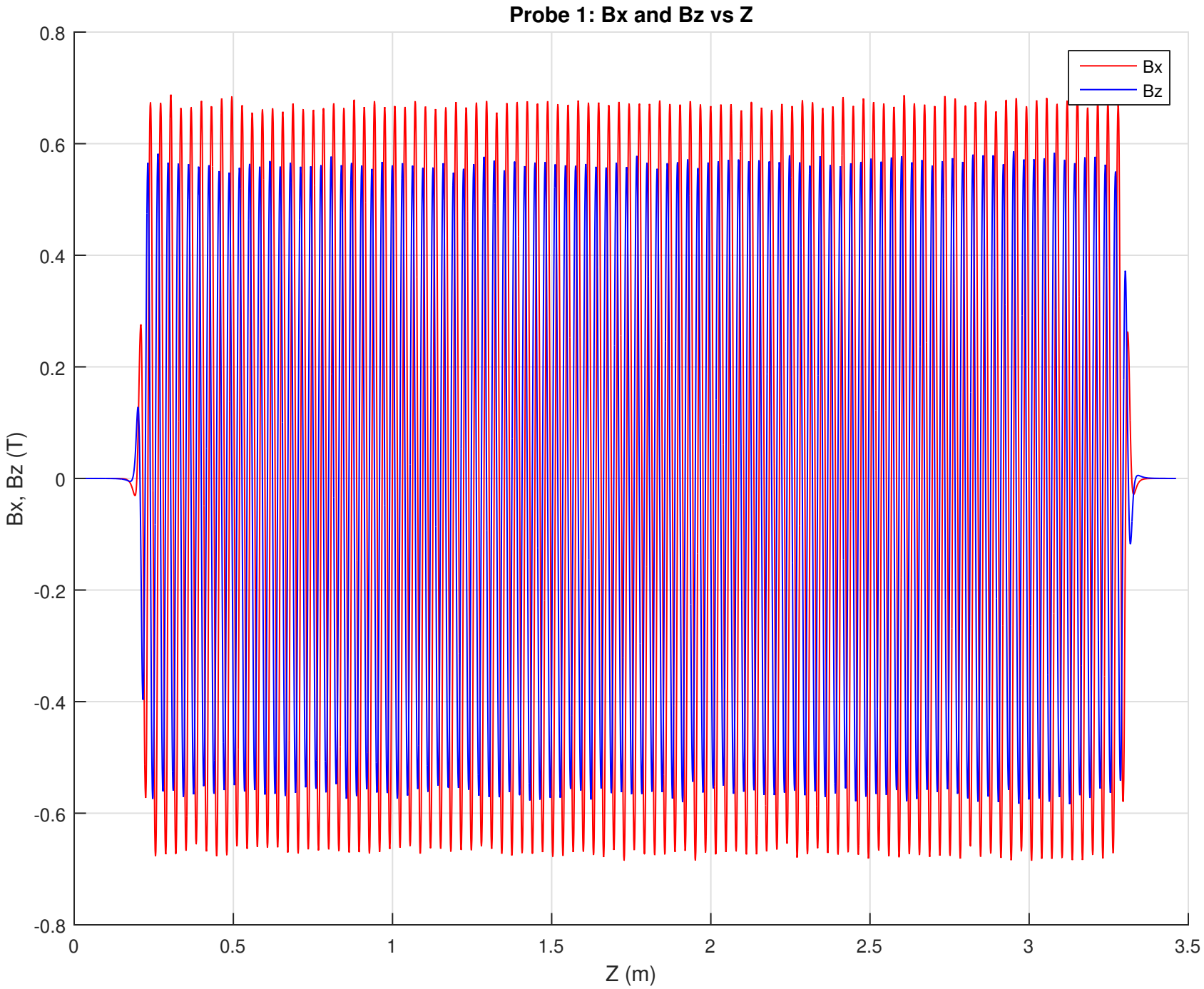

Probe 2: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5
Z Position (m)

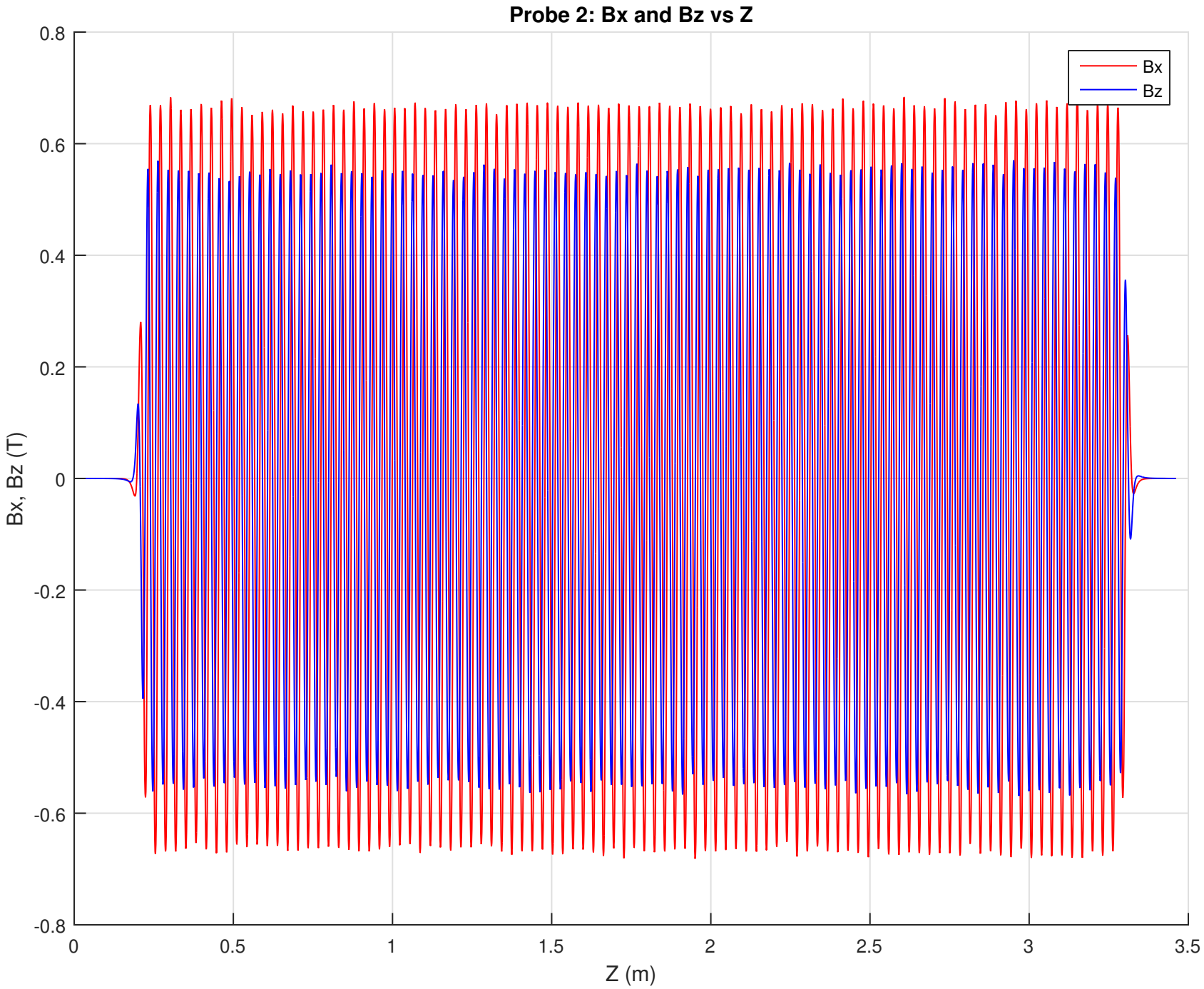

Probe 1: Bx and By vs Z
Bx
By
Bx, By (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

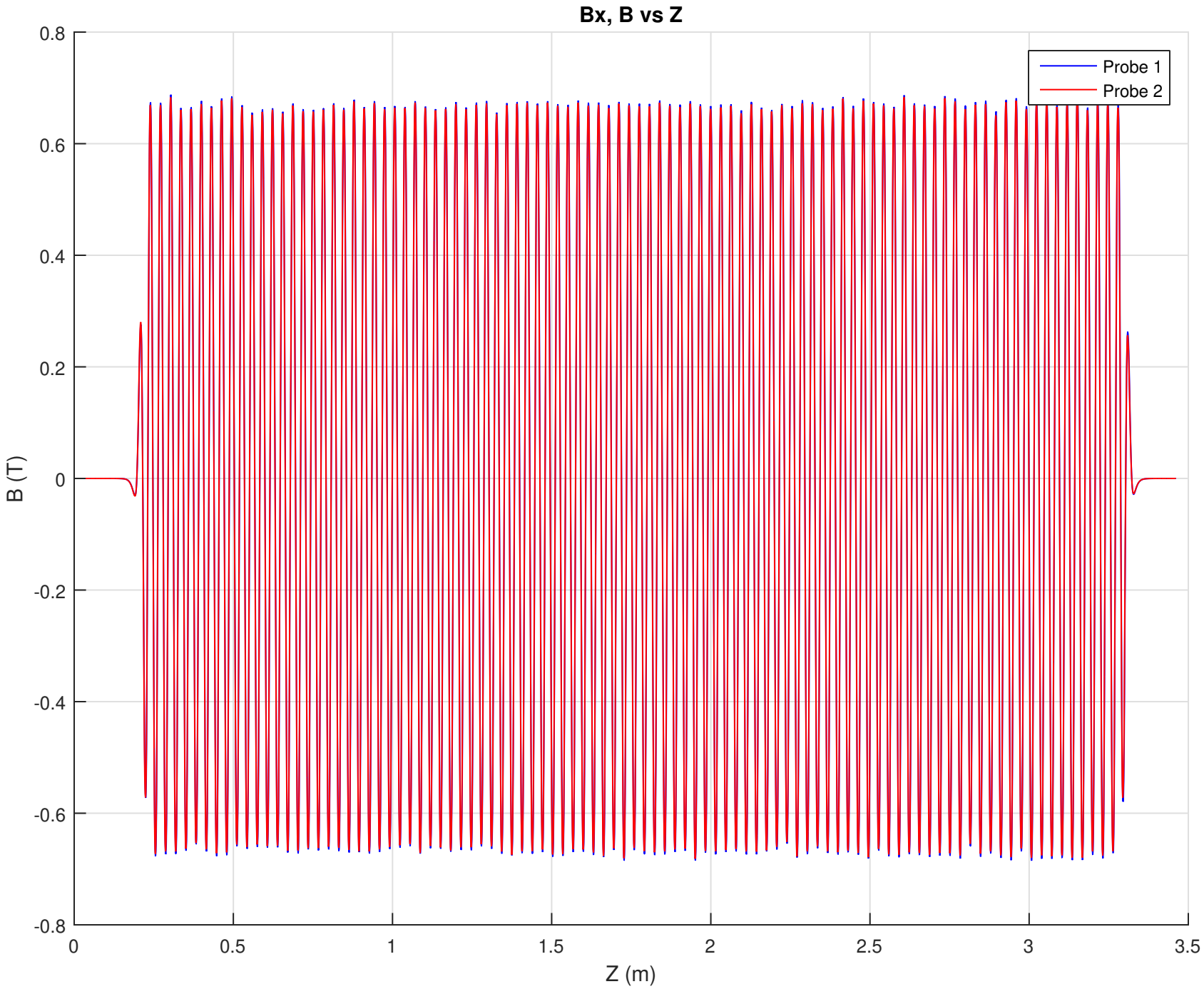

Probe 2: Bx and By vs Z
Bx
By
Bx, By (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

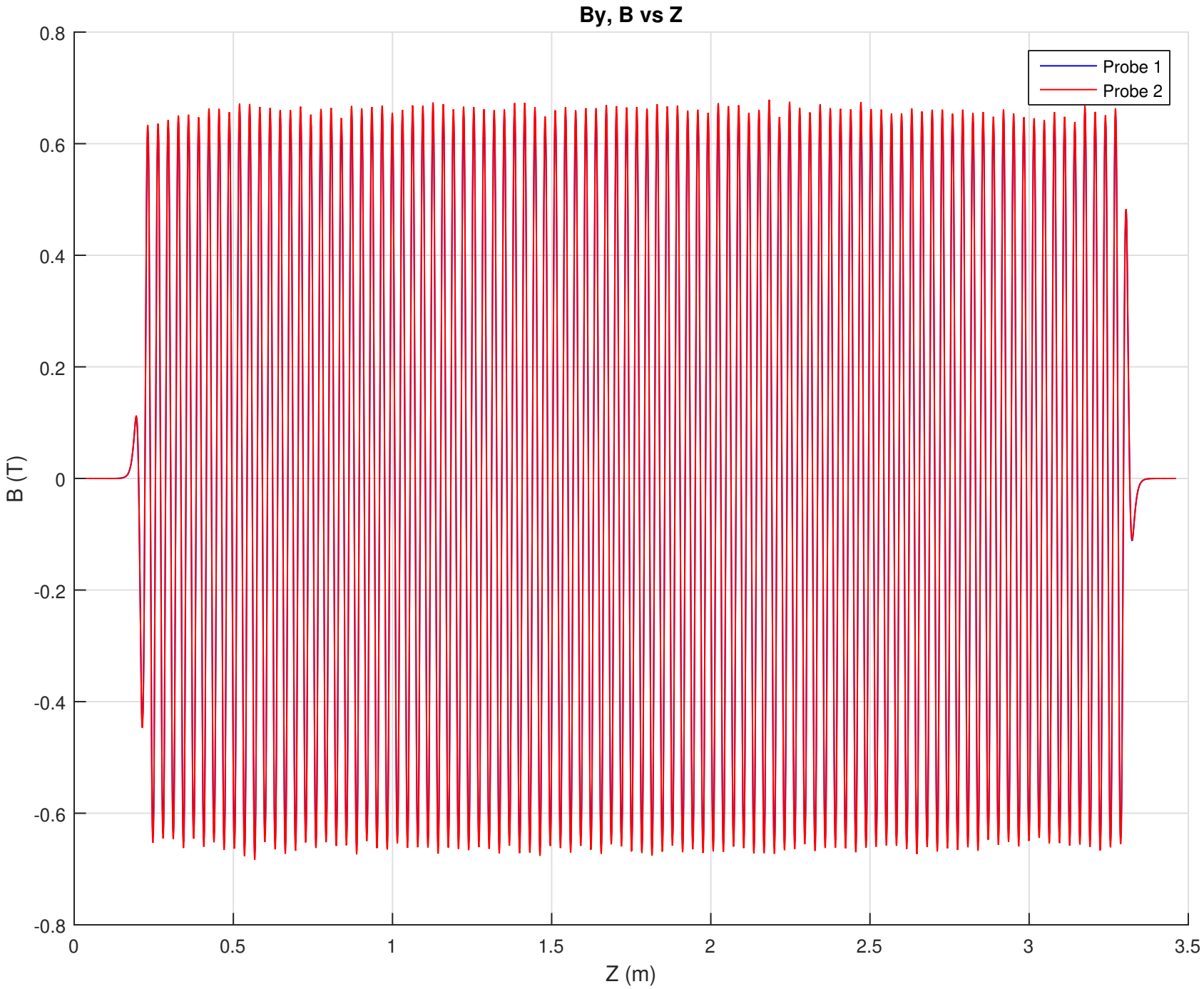

Probe 1: By and Bz vs Z
By
Bz
By, Bz (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

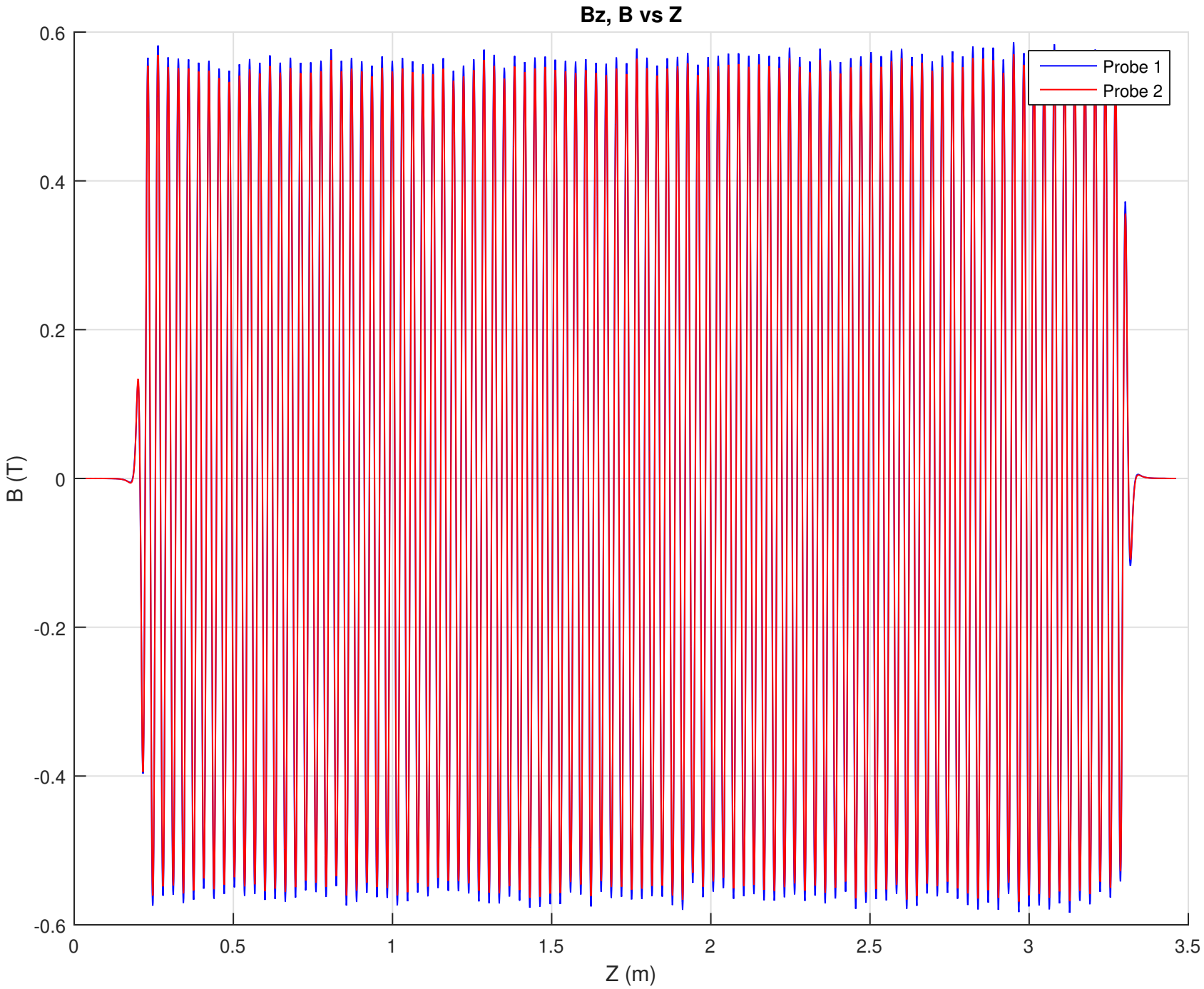

Probe 2: By and Bz vs Z
By
Bz
By, Bz (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

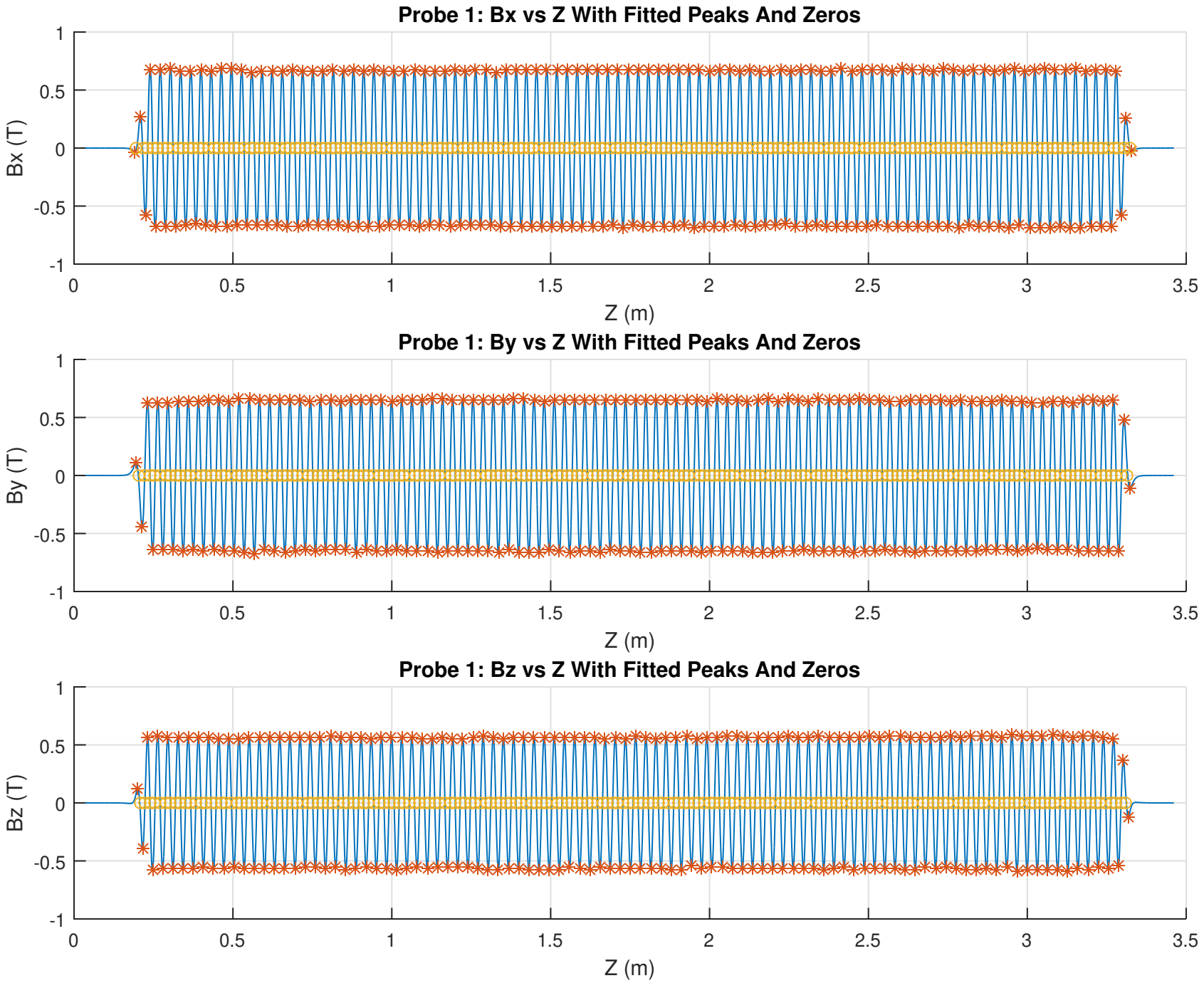

Probe 1: Bx and Bz vs Z
Bx
Bz
Bx, Bz (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

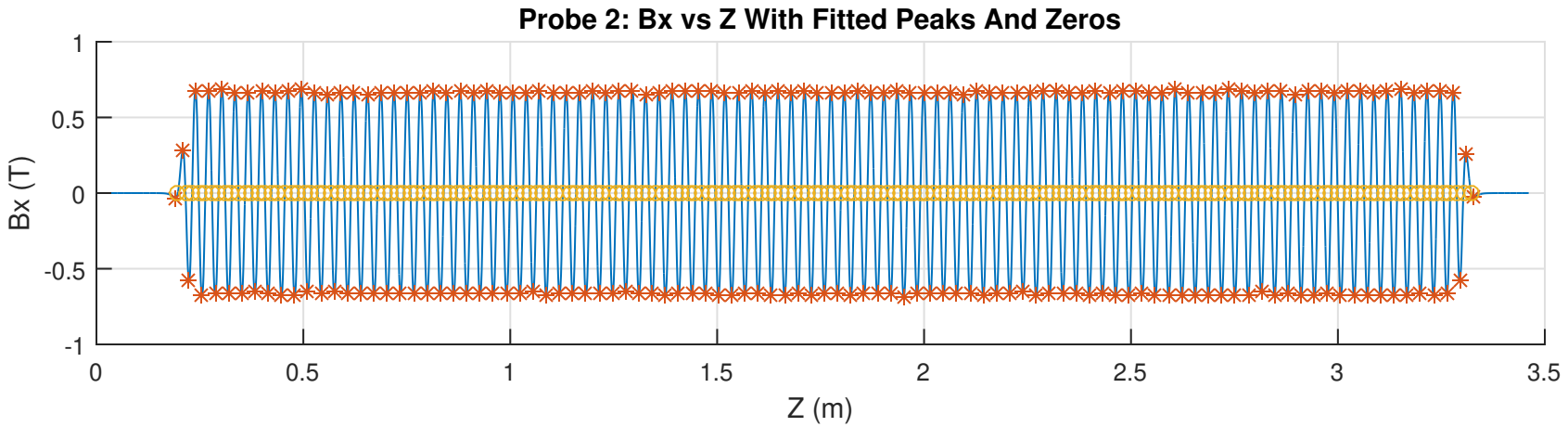

Probe 2: Bx and Bz vs Z
Bx
Bz
Bx, Bz (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

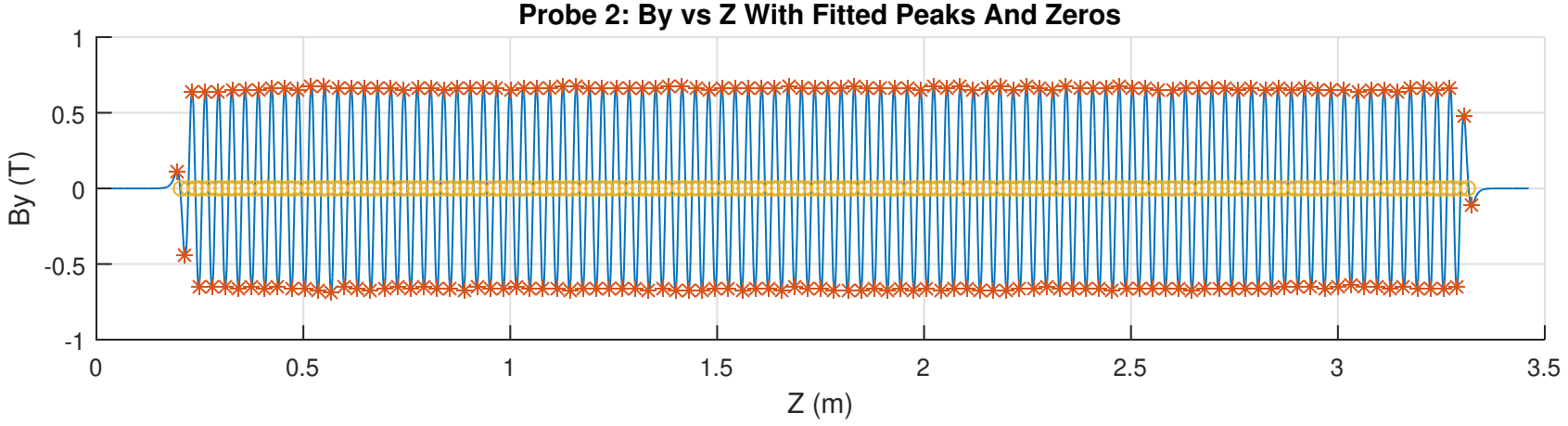

Bx, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

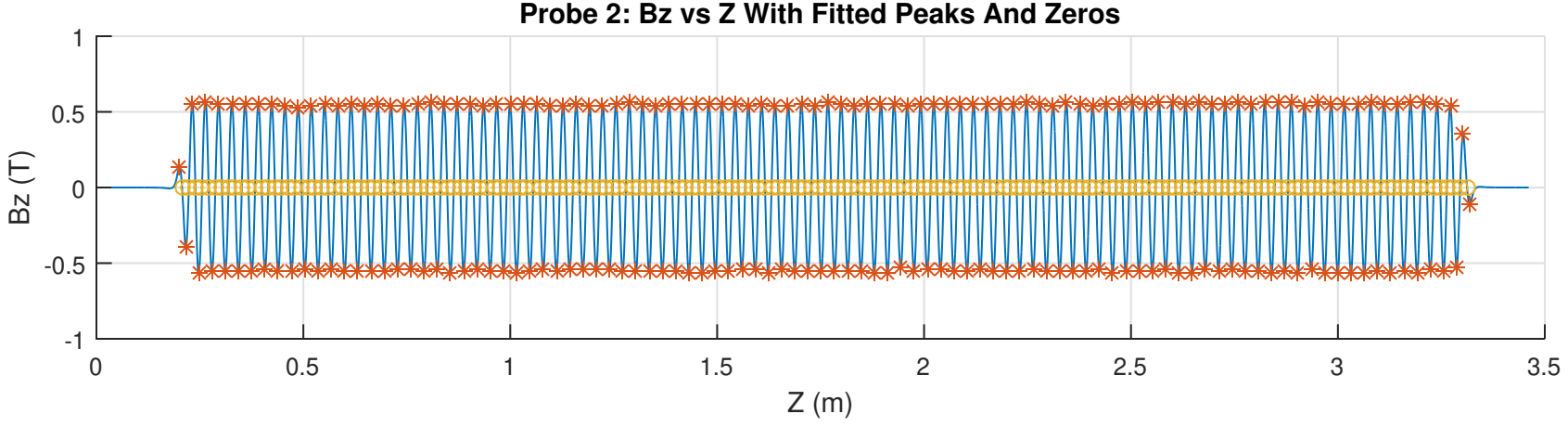

By, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
0.5
1
1.5
2
2.5
3
3.5

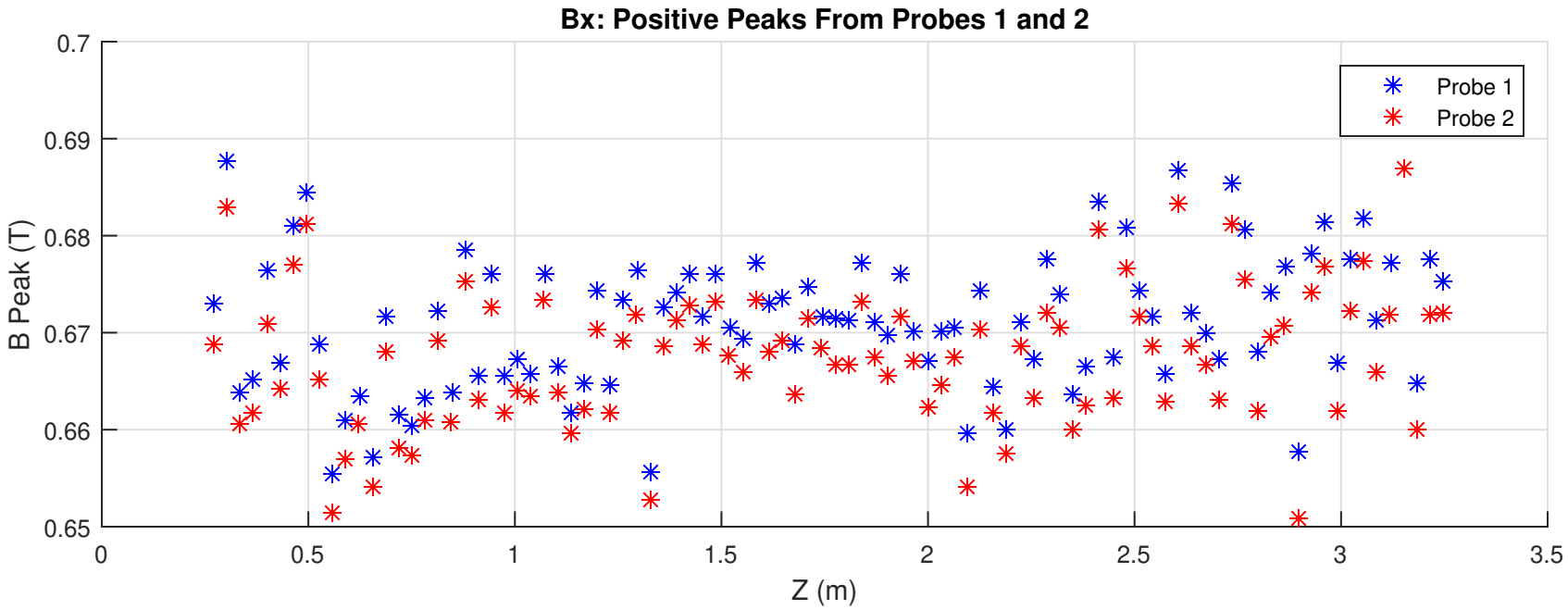

Bz, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0
0.5
1
1.5
2
2.5
3
3.5

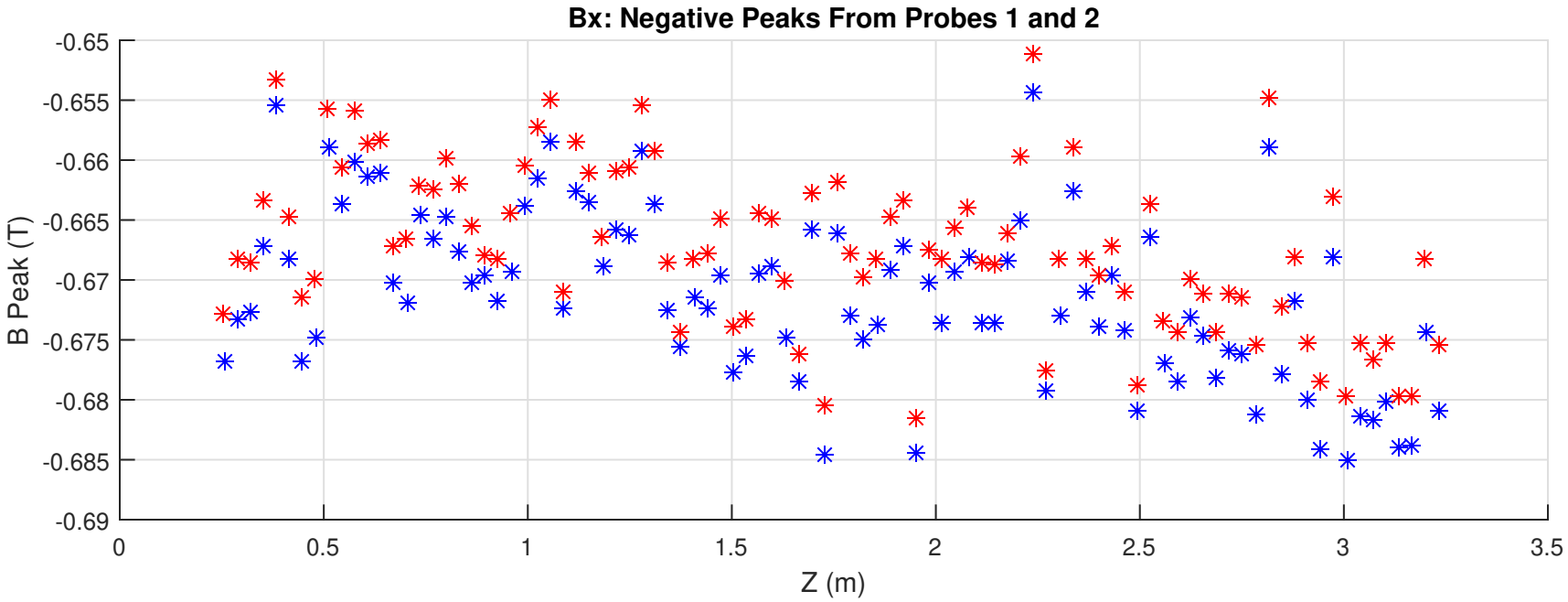

Probe 1: Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
Probe 1: By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
Probe 1: Bz vs Z With Fitted Peaks And Zeros
Bz (T)
Z (m)

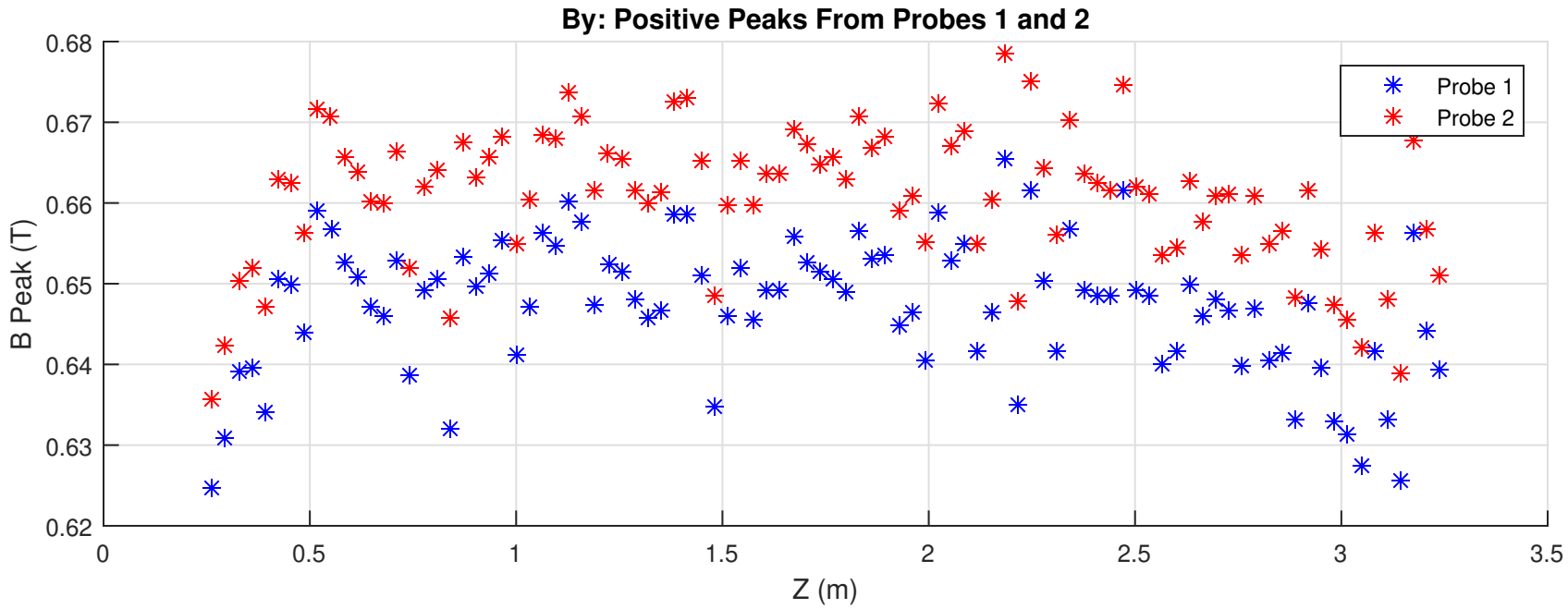

Probe 2: Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5

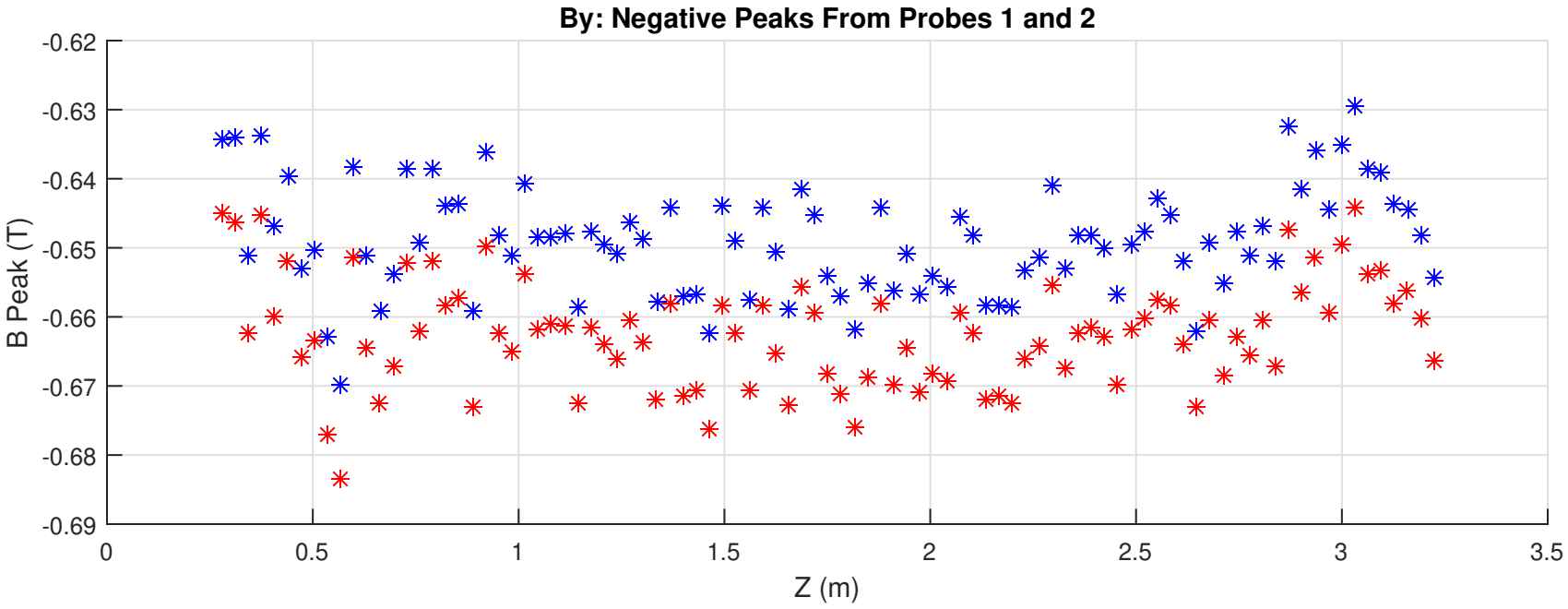

Probe 2: By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5

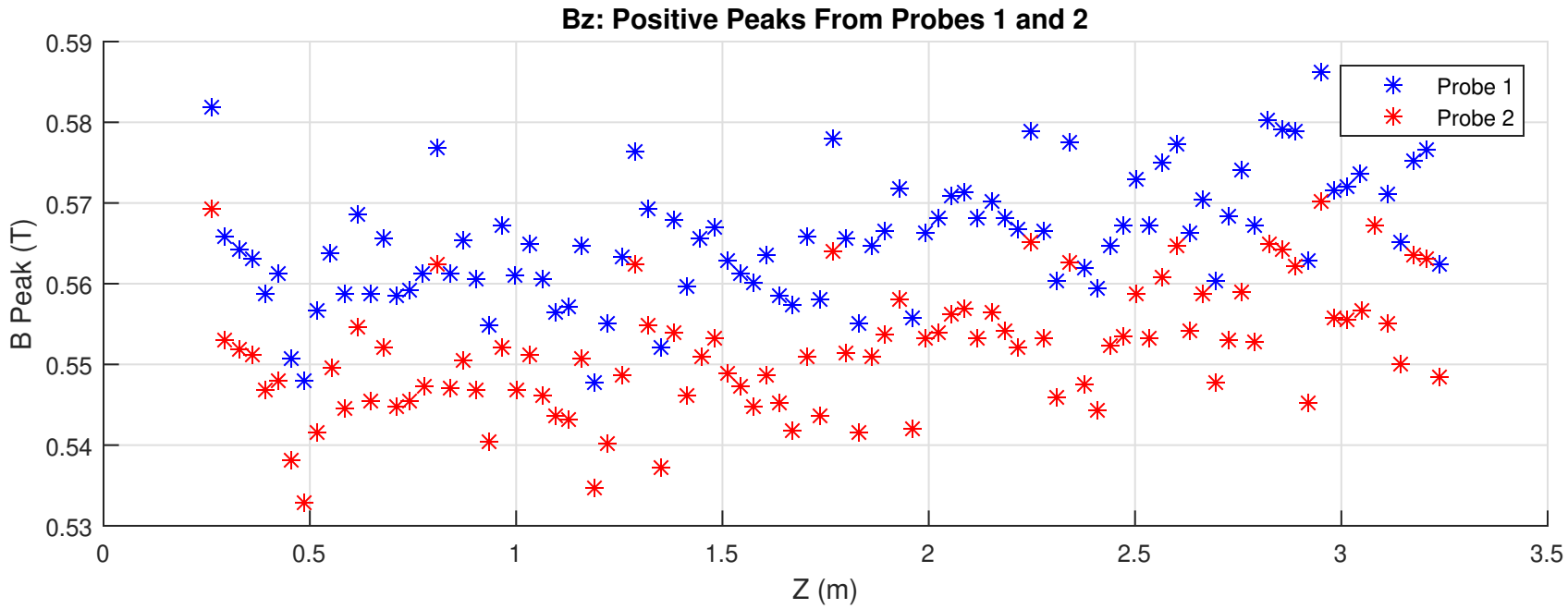

Probe 2: Bz vs Z With Fitted Peaks And Zeros
Bz (T)
Z (m)
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5

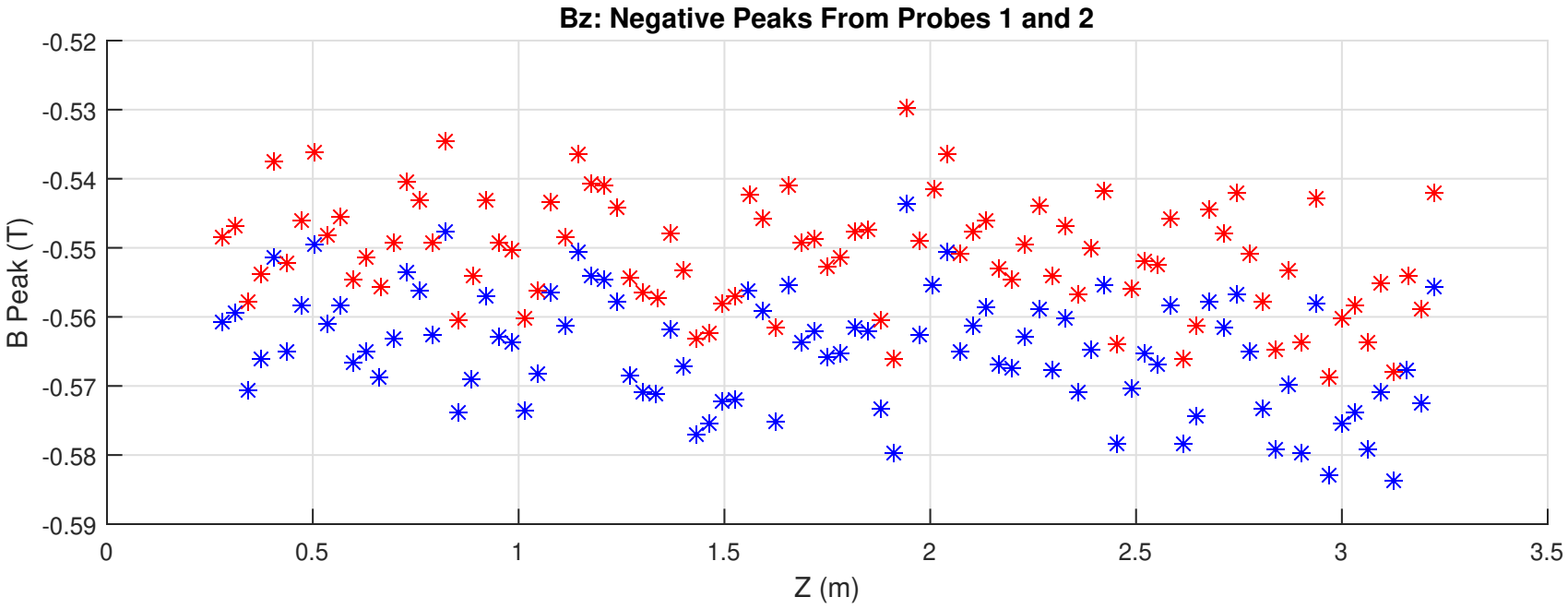

Bx: Positive Peaks From Probes 1 and 2
Probe 1
Probe 2
B Peak (T)
Z (m)
0.7
0.69
0.68
0.67
0.66
0.65
0
0.5
1
1.5
2
2.5
3
3.5


Bx: Negative Peaks From Probes 1 and 2
B Peak (T)
Z (m)
-0.65
-0.655
-0.66
-0.665
-0.67
-0.675
-0.68
-0.685
-0.69
0
0.5
1
1.5
2
2.5
3
3.5


By: Positive Peaks From Probes 1 and 2
B Peak (T)
Z (m)
Probe 1
Probe 2
0.68
0.67
0.66
0.65
0.64
0.63
0.62
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)
-0.62
-0.63
-0.64
-0.65
-0.66
-0.67
-0.68
-0.69
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)
0.59
0.58
0.57
0.56
0.55
0.54
0.53
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)
-0.52
-0.53
-0.54
-0.55
-0.56
-0.57
-0.58
-0.59
0
0.5
1
1.5
2
2.5
3
3.5