SLAC Magnetic Measurements

Hall Probe Array Analysis
****

Parameters:
INPUT-FILE-DIR =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Data Set 1 Run 042\LP13N\K
INPUT-FILE-NAME =DUTestOutput.dat
INPUT-FILE-TYPE =ZVXYZVXYZH
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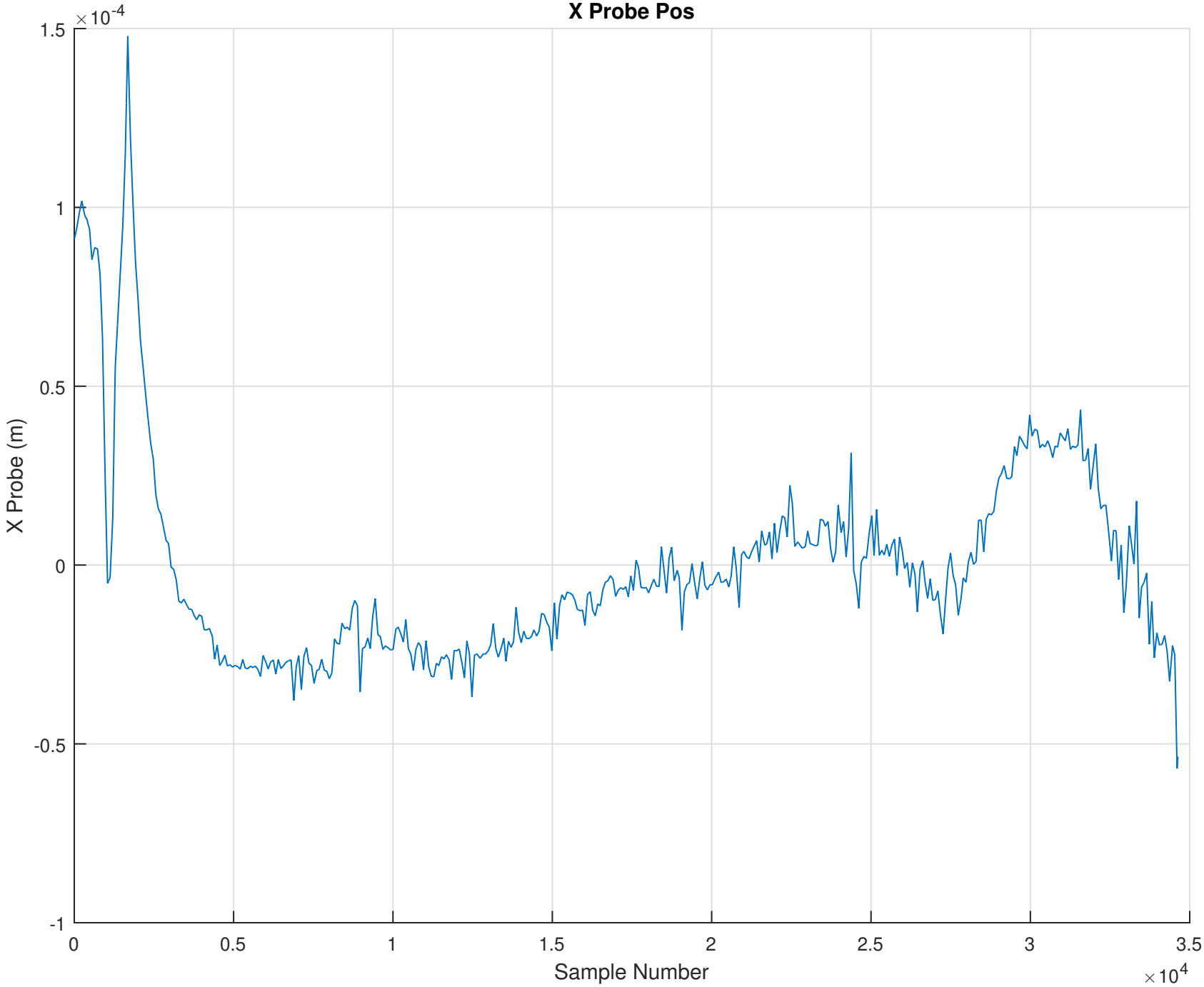
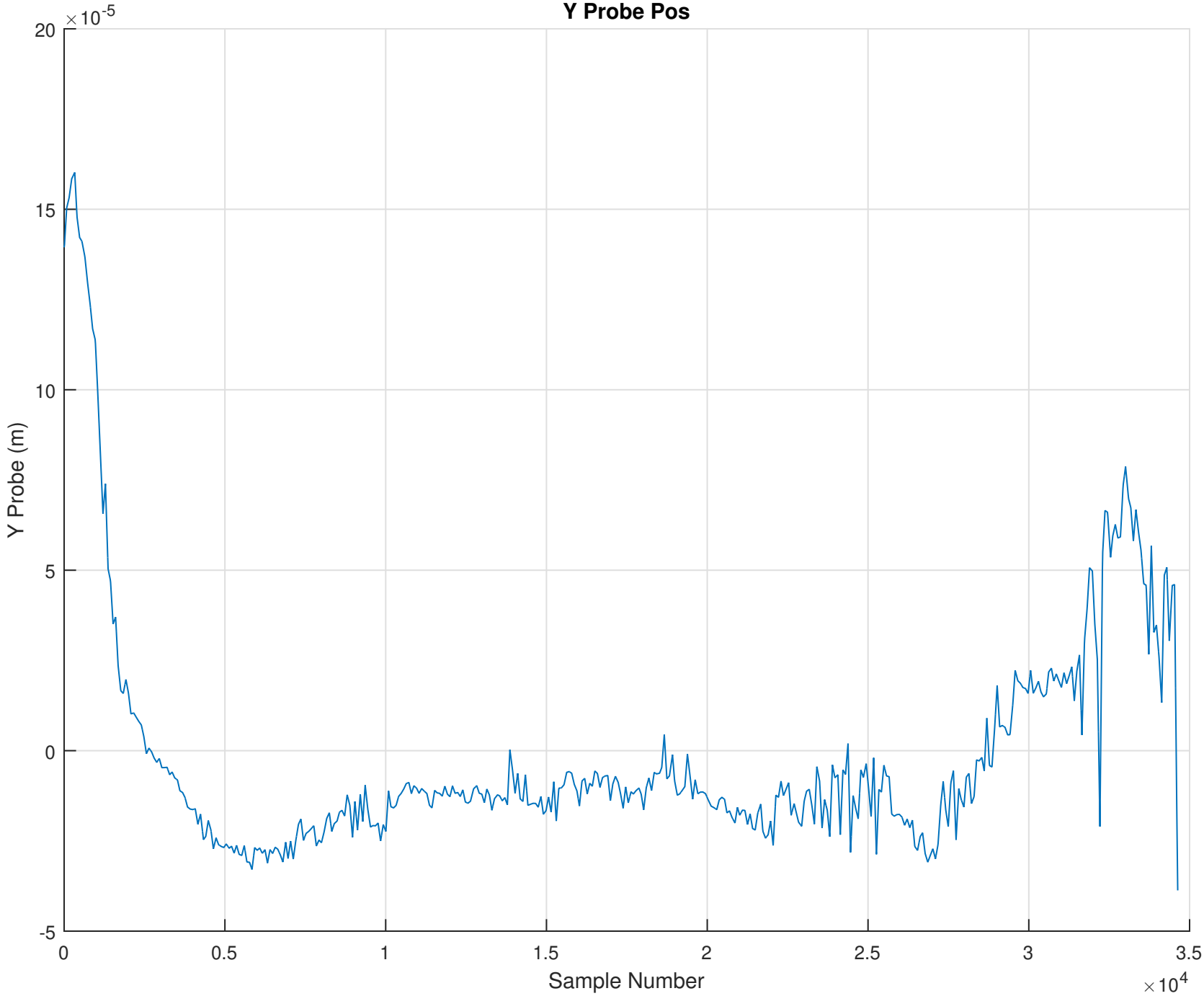
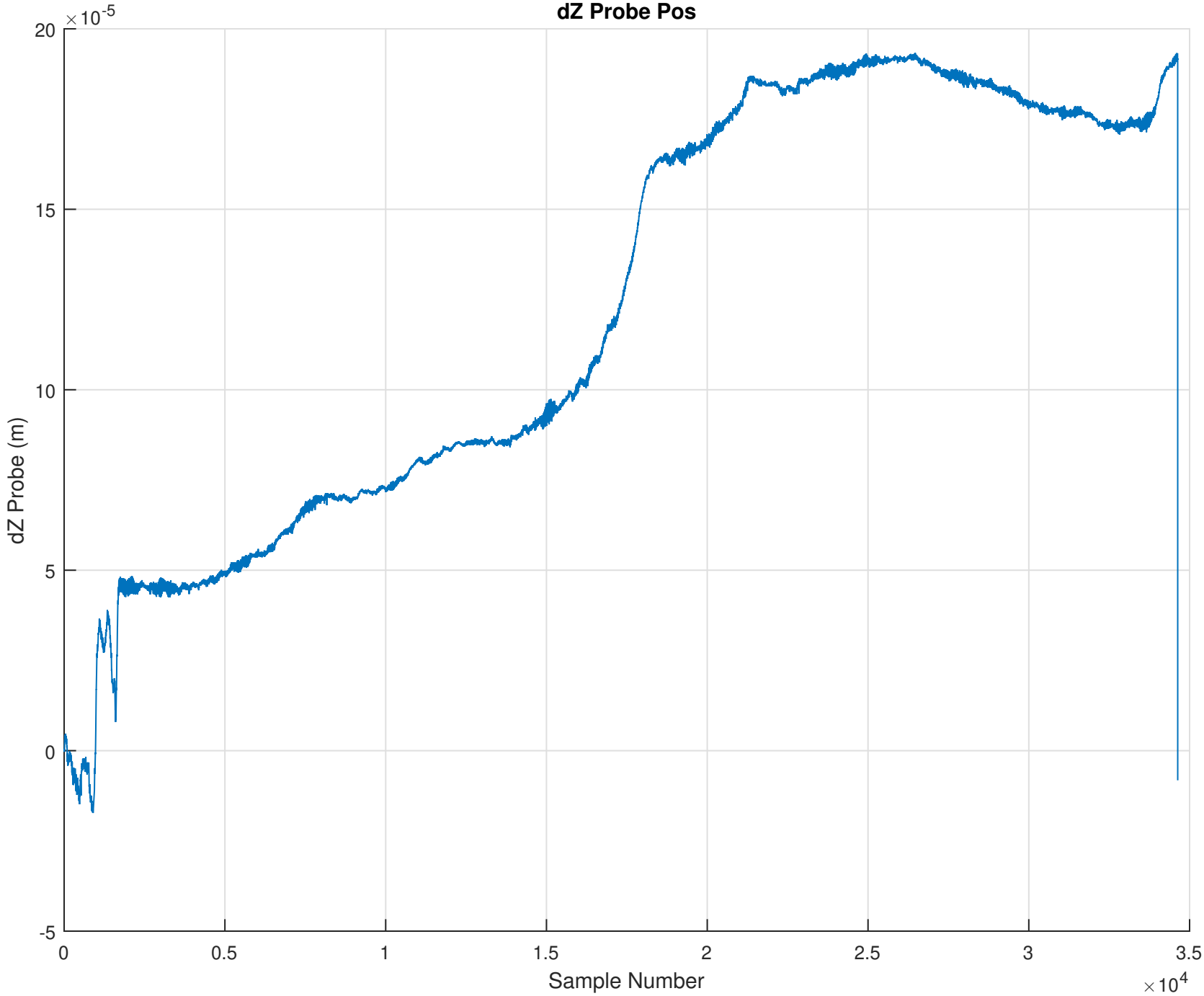
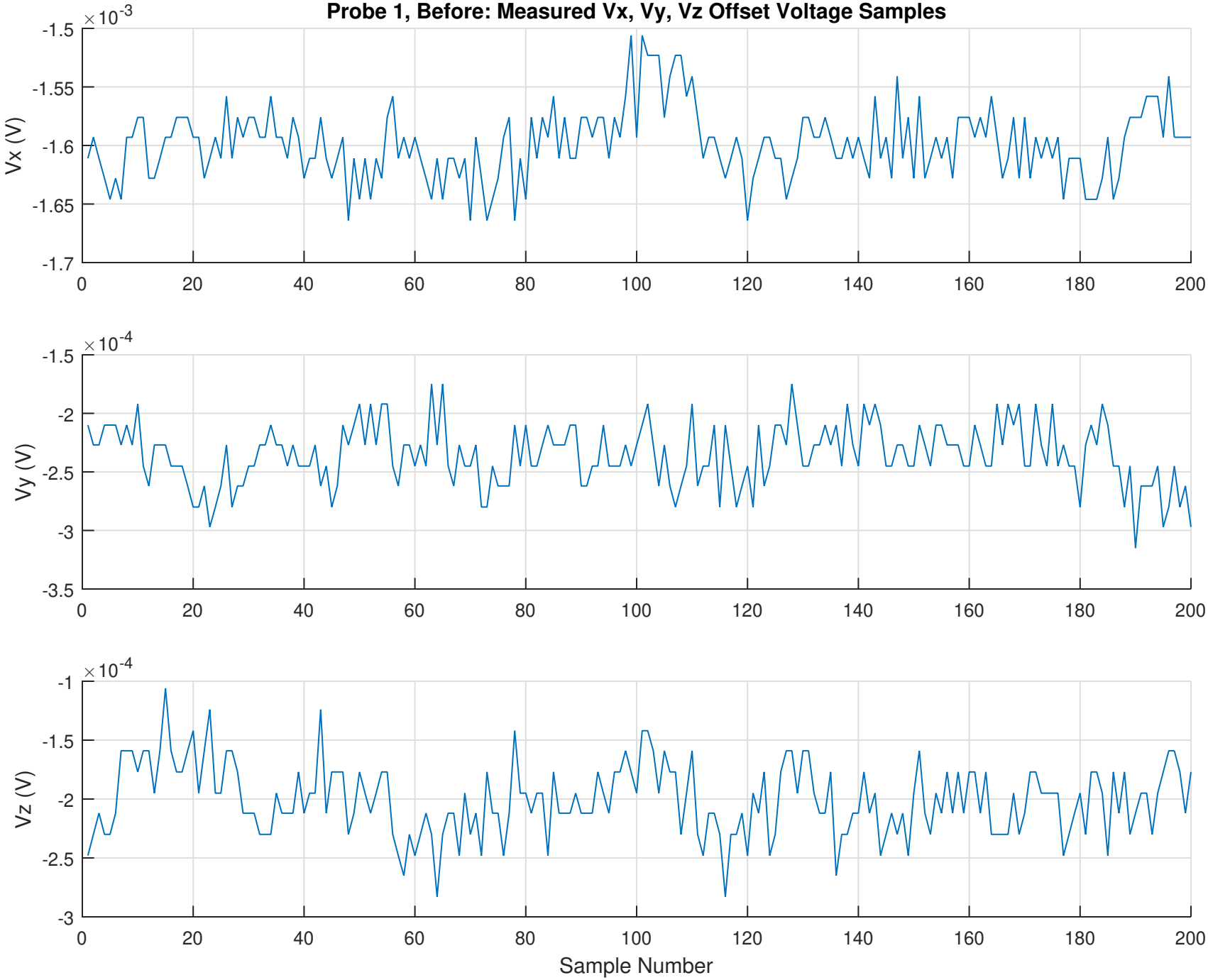
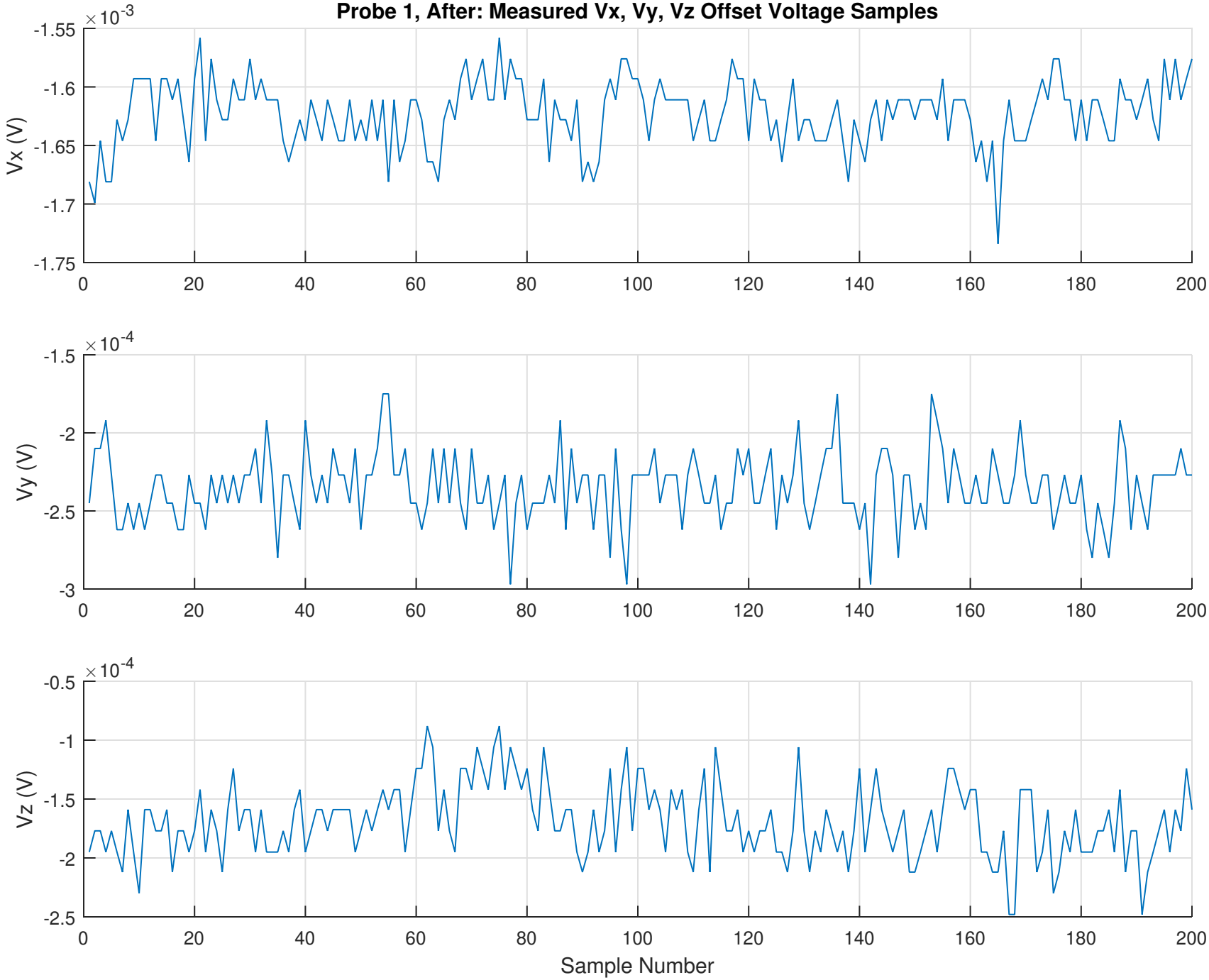
PROBE1-BX-CALIB-FILE =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Yurii Hall Probe Calib
PROBE1-BY-CALIB-FILE =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Yurii Hall Probe Calib
PROBE2-BX-CALIB-FILE =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 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

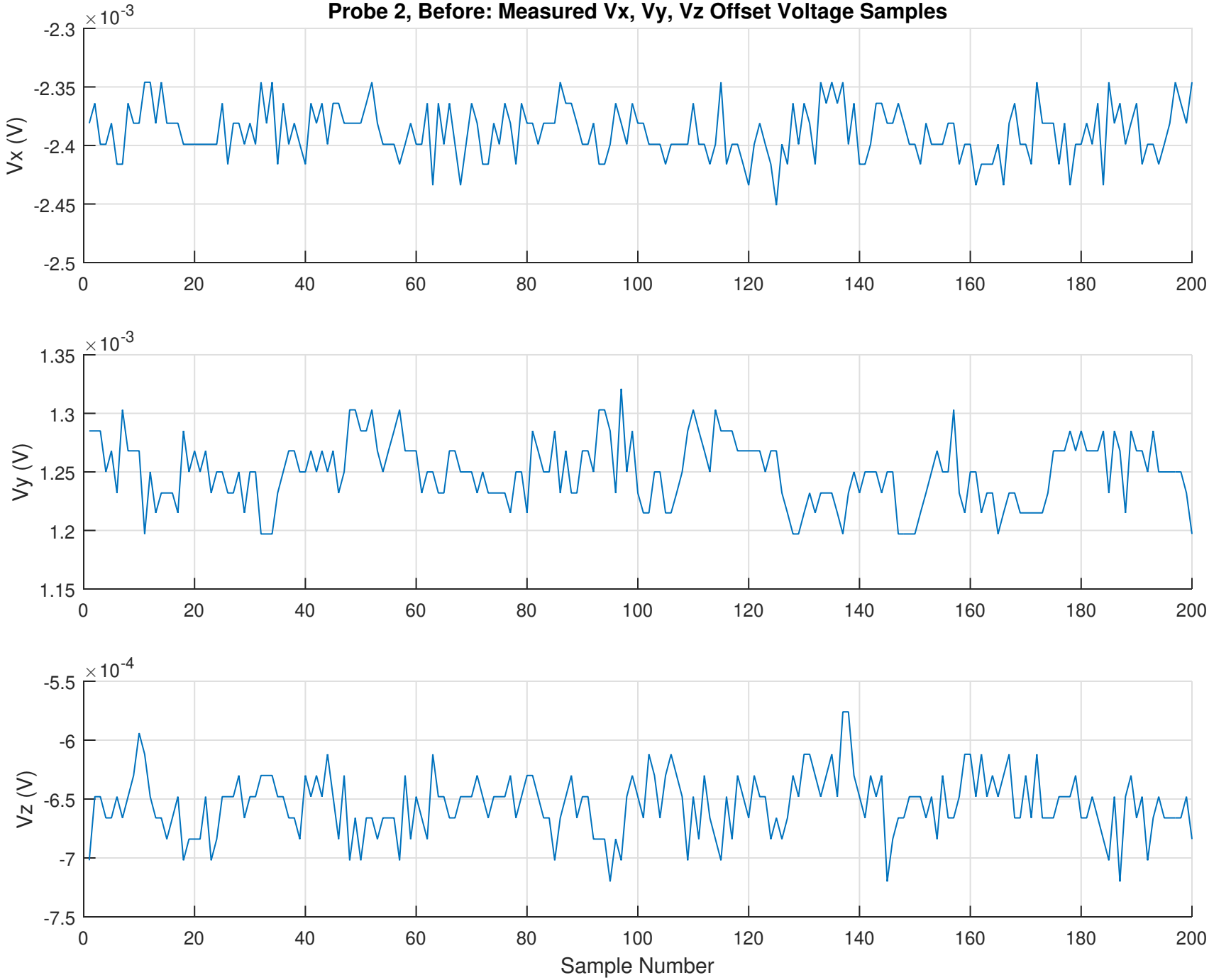

X Probe Pos
×10-4
1.5
1
0.5
0
-0.5
-1
X Probe (m)
0
0.5
1
1.5
2
2.5
3
3.5
Sample Number
×10^4

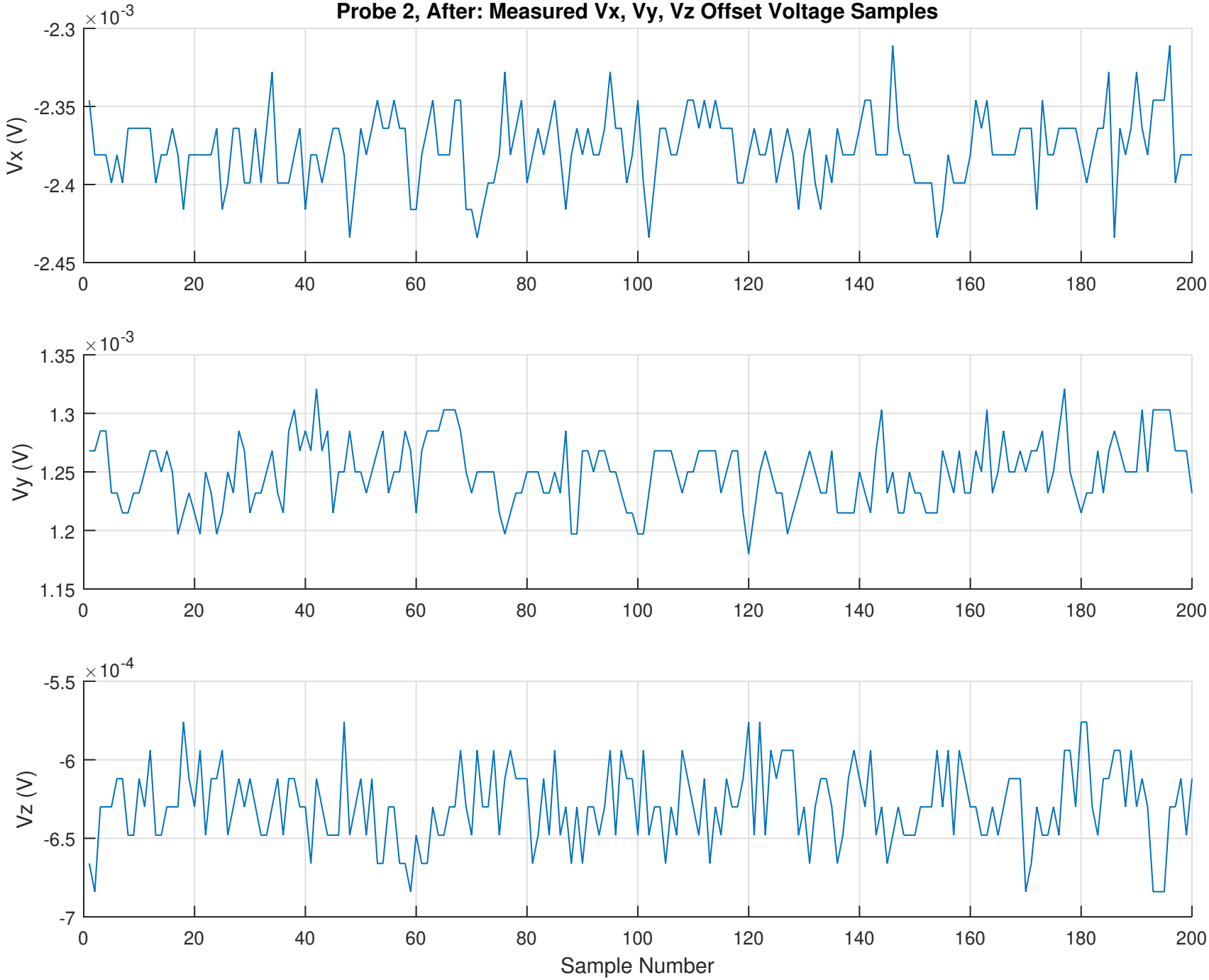

Y Probe Pos
×10-5
20
15
10
5
0
-5
Y Probe (m)
0
0.5
1
1.5
2
2.5
3
3.5
Sample Number
×10^4

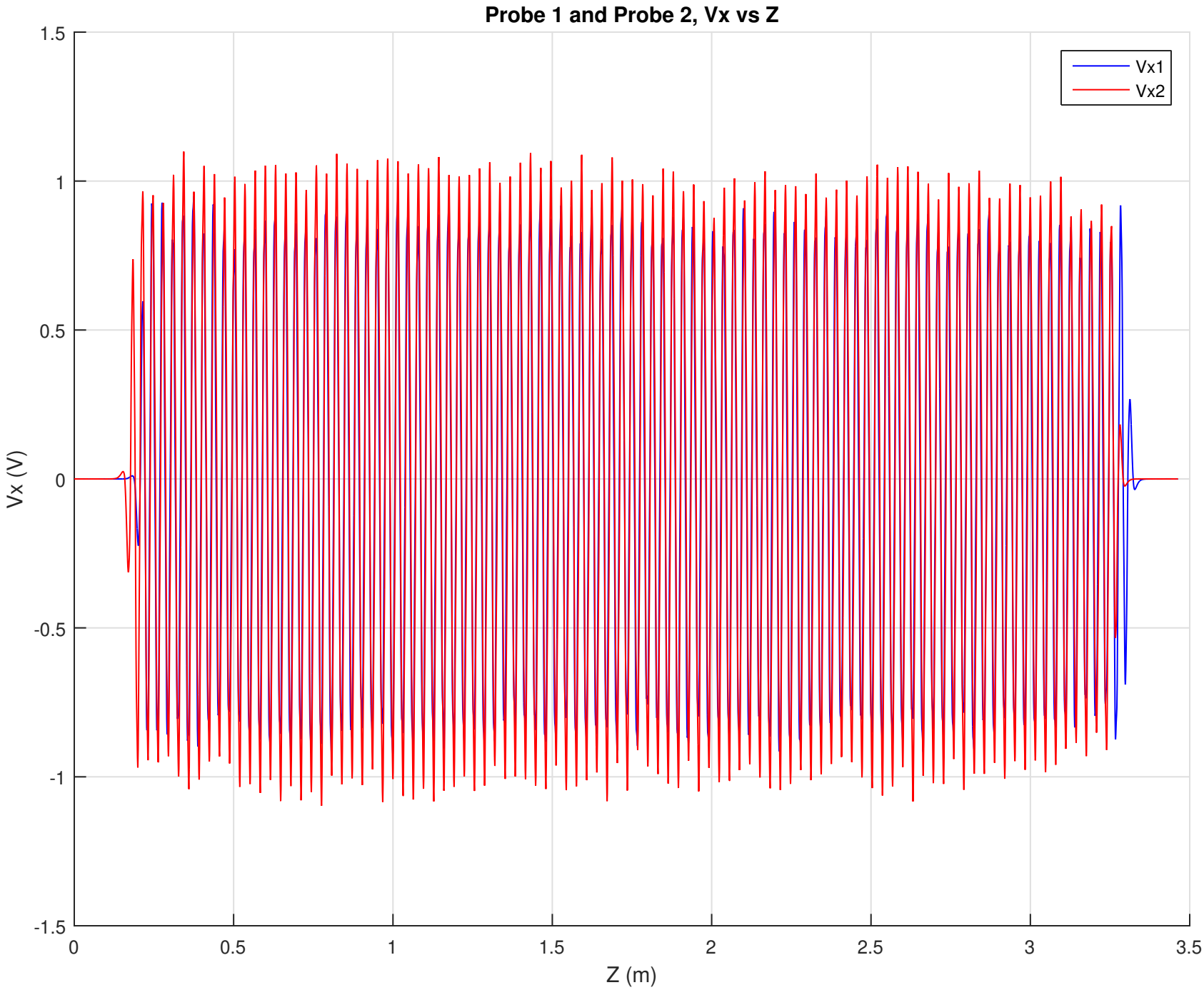

dZ Probe Pos
×10-5
20
15
10
5
0
-5
dZ Probe (m)
0
0.5
1
1.5
2
2.5
3
3.5
Sample Number
×10^4

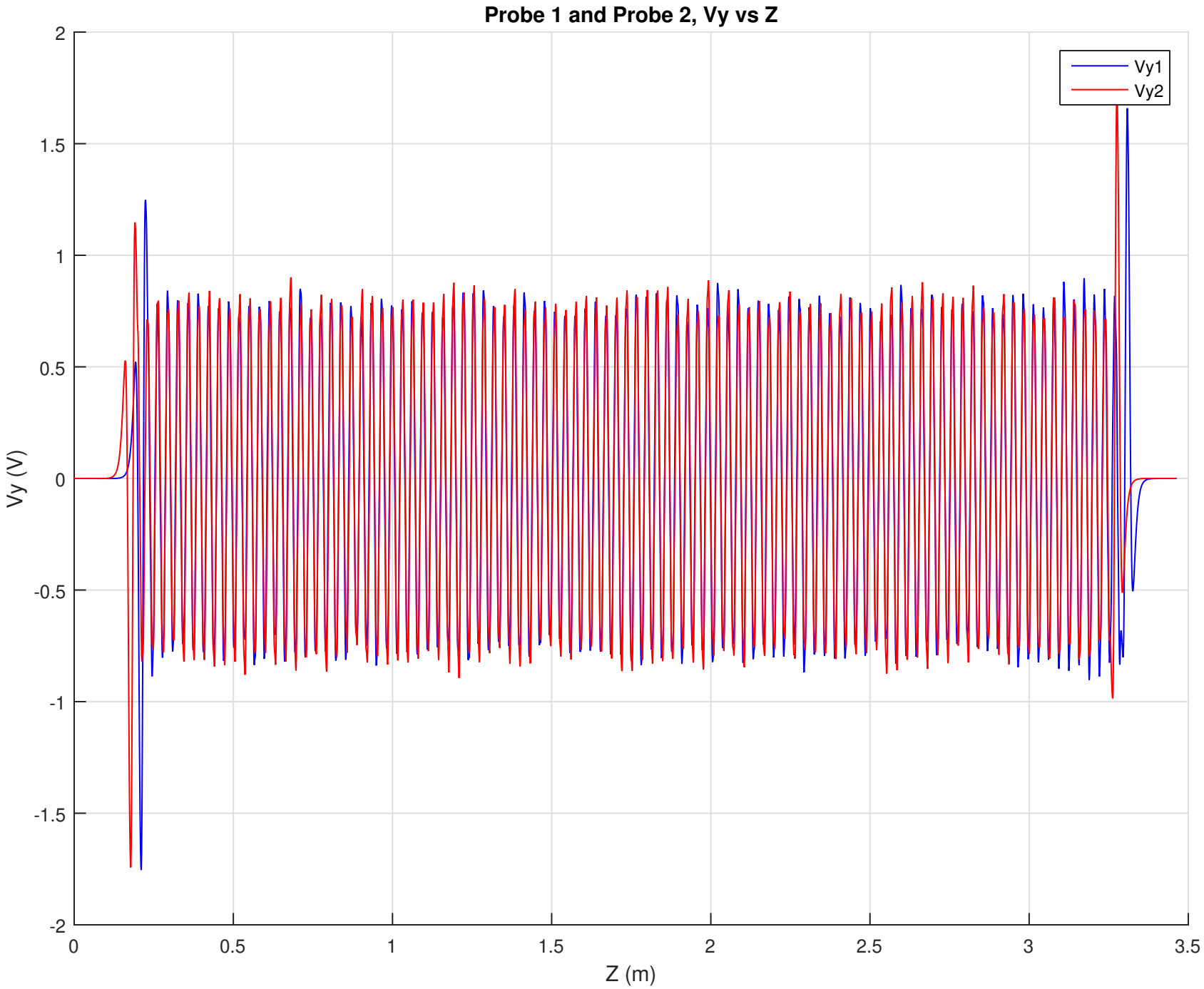

Probe 1, Before: Measured Vx, Vy, Vz Offset Voltage Samples
×10^-3
-1.5
-1.55
-1.6
-1.65
-1.7
Vx (V)
×10^-4
-1.5
-2
-2.5
-3
-3.5
Vy (V)
×10^-4
-1
-1.5
-2
-2.5
-3
Vz (V)
0
20
40
60
80
100
120
140
160
180
200
Sample Number

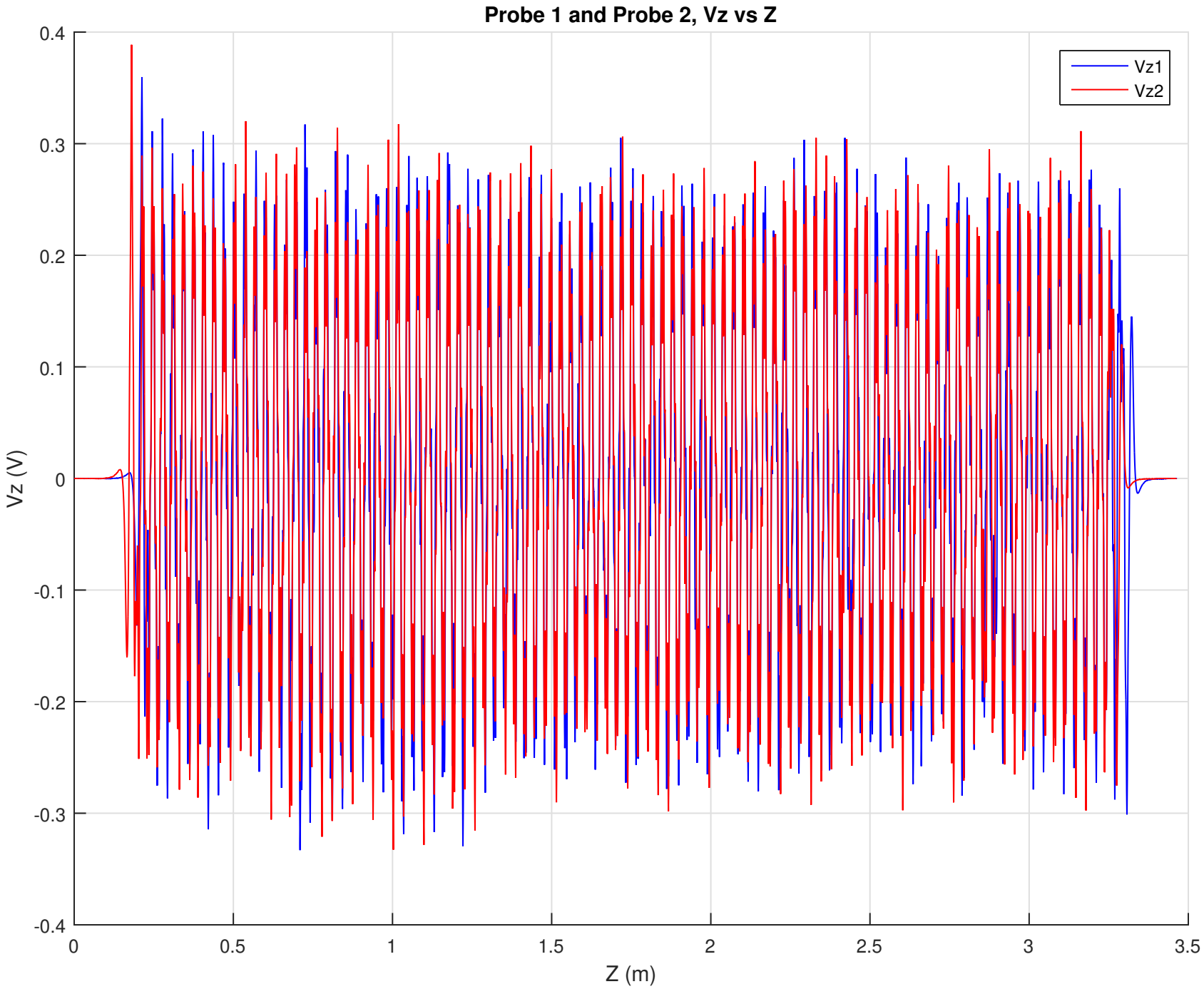

Probe 1, After: Measured Vx, Vy, Vz Offset Voltage Samples
×10^-3
-1.55
-1.6
-1.65
-1.7
-1.75
Vx (V)
×10^-4
-1.5
-2
-2.5
-3
Vy (V)
×10^-4
-0.5
-1
-1.5
-2
-2.5
Vz (V)
0
20
40
60
80
100
120
140
160
180
200
Sample Number

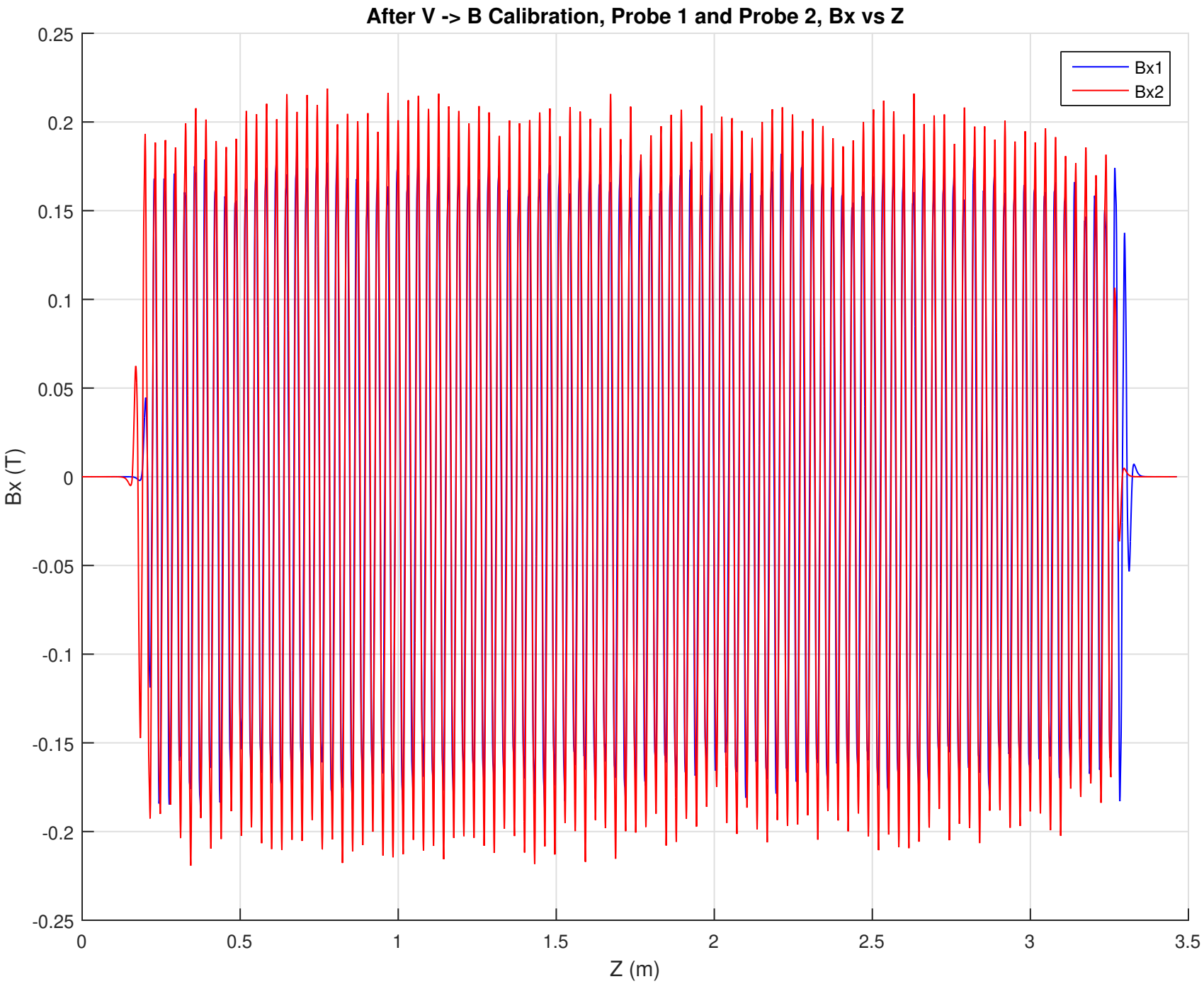

Probe 2, Before: Measured Vx, Vy, Vz Offset Voltage Samples
×10-3
-2.3
-2.35
-2.4
-2.45
-2.5
Vx (V)
0
20
40
60
80
100
120
140
160
180
200
×10-3
1.35
1.3
1.25
1.2
1.15
Vy (V)
×10-4
-5.5
-6
-6.5
-7
-7.5
Vz (V)
Sample Number

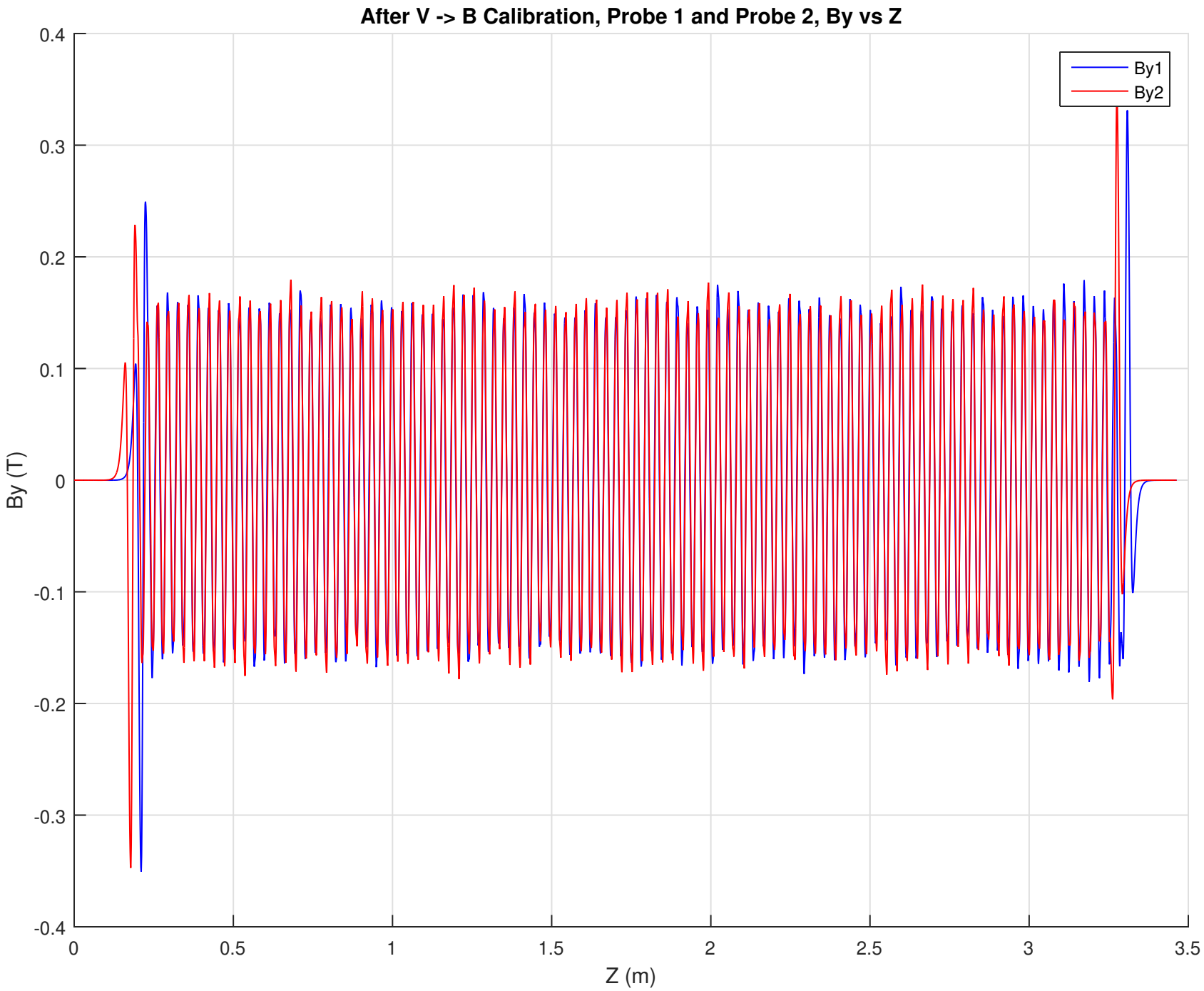

Probe 2, After: Measured Vx, Vy, Vz Offset Voltage Samples
×10-3
-2.3
-2.35
-2.4
-2.45
Vx (V)
0
20
40
60
80
100
120
140
160
180
200
×10-3
1.35
1.3
1.25
1.2
1.15
Vy (V)
0
20
40
60
80
100
120
140
160
180
200
×10-4
-5.5
-6
-6.5
-7
Vz (V)
0
20
40
60
80
100
120
140
160
180
200
Sample Number

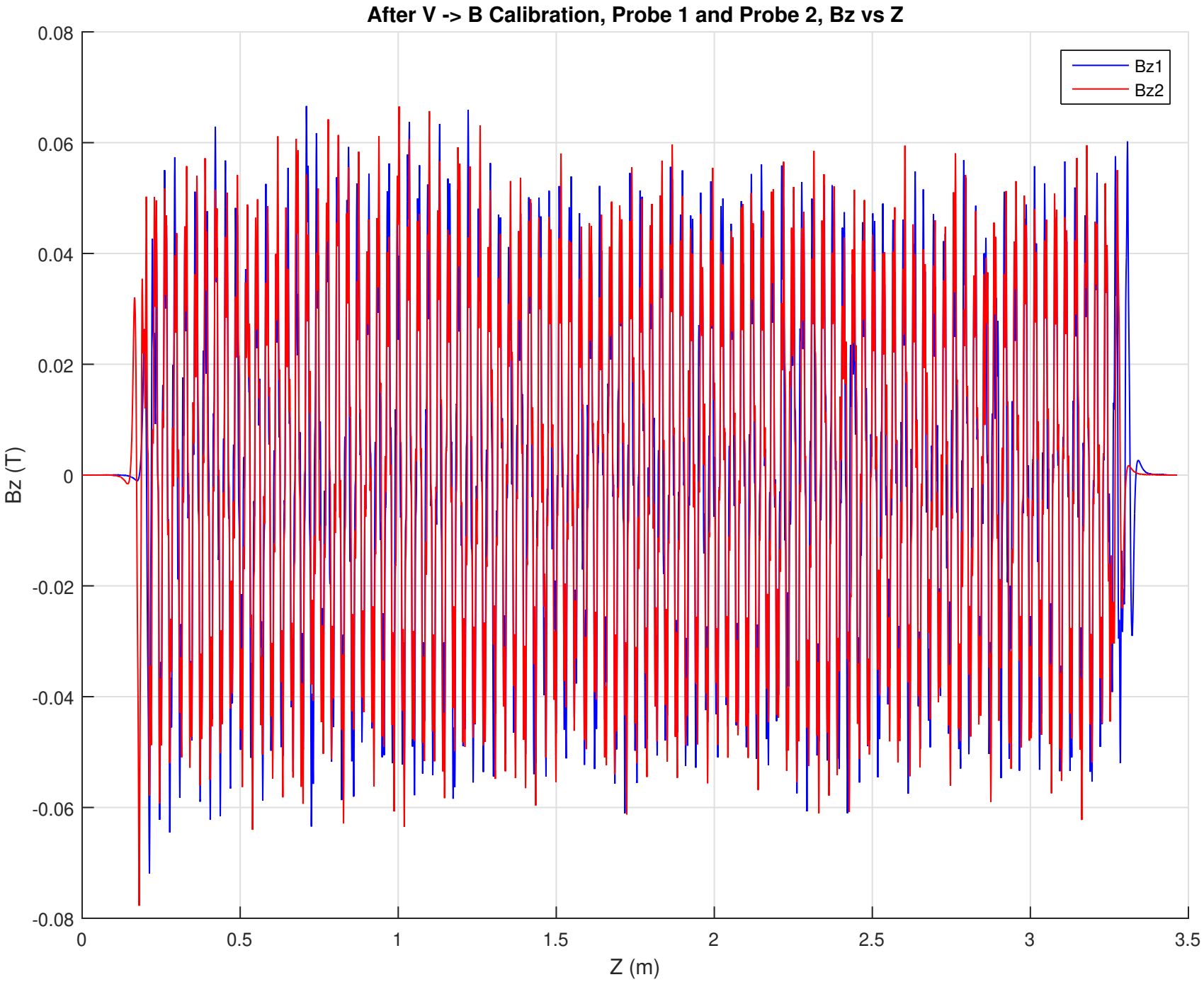

Probe 1 and Probe 2, Vx vs Z
Vx1
Vx2
Vx (V)
Z (m)
1.5
1
0.5
0
-0.5
-1
-1.5
0
0.5
1
1.5
2
2.5
3
3.5

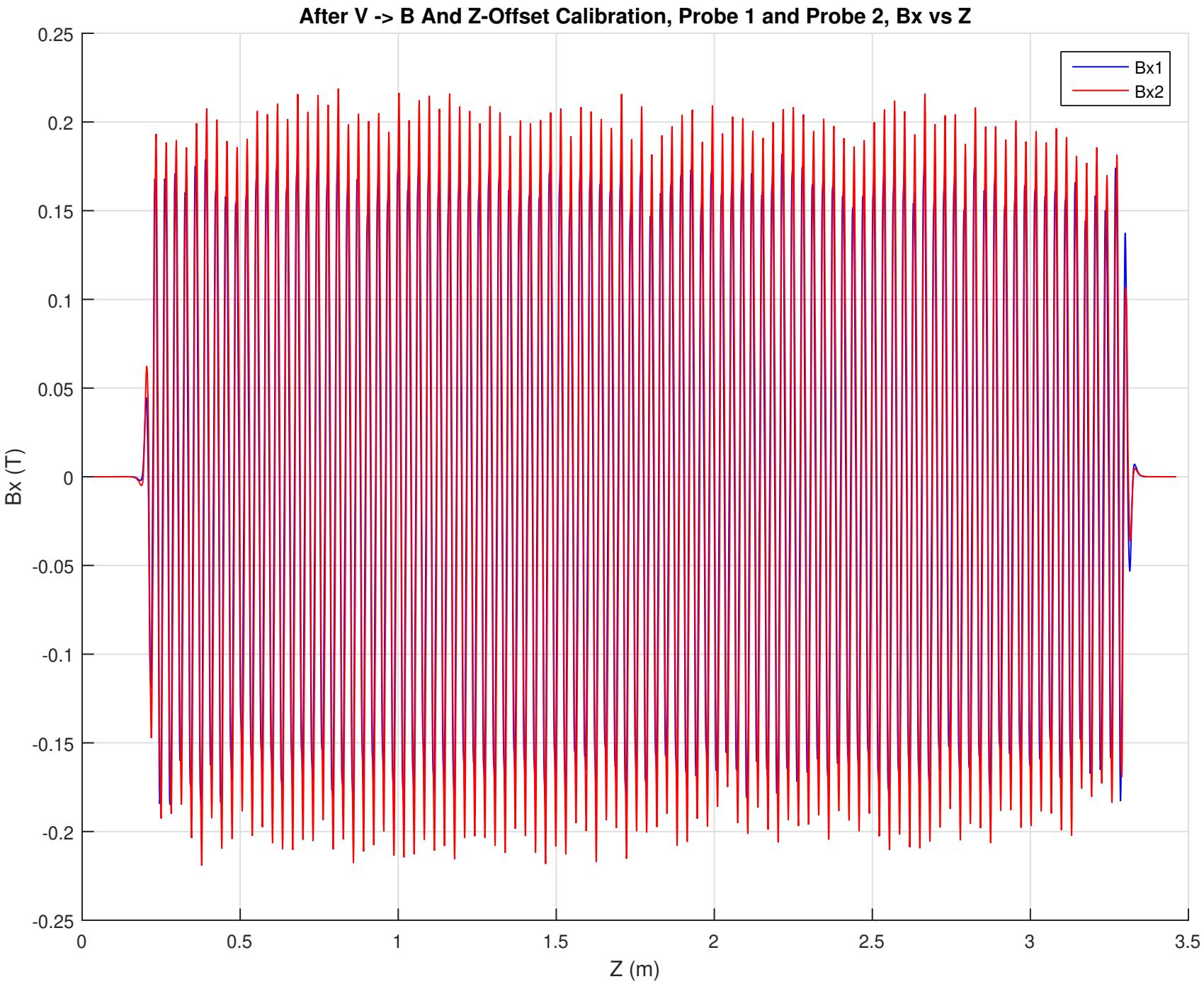

Probe 1 and Probe 2, Vy vs Z
Vy1
Vy2
Vy (V)
Z (m)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
0.5
1
1.5
2
2.5
3
3.5

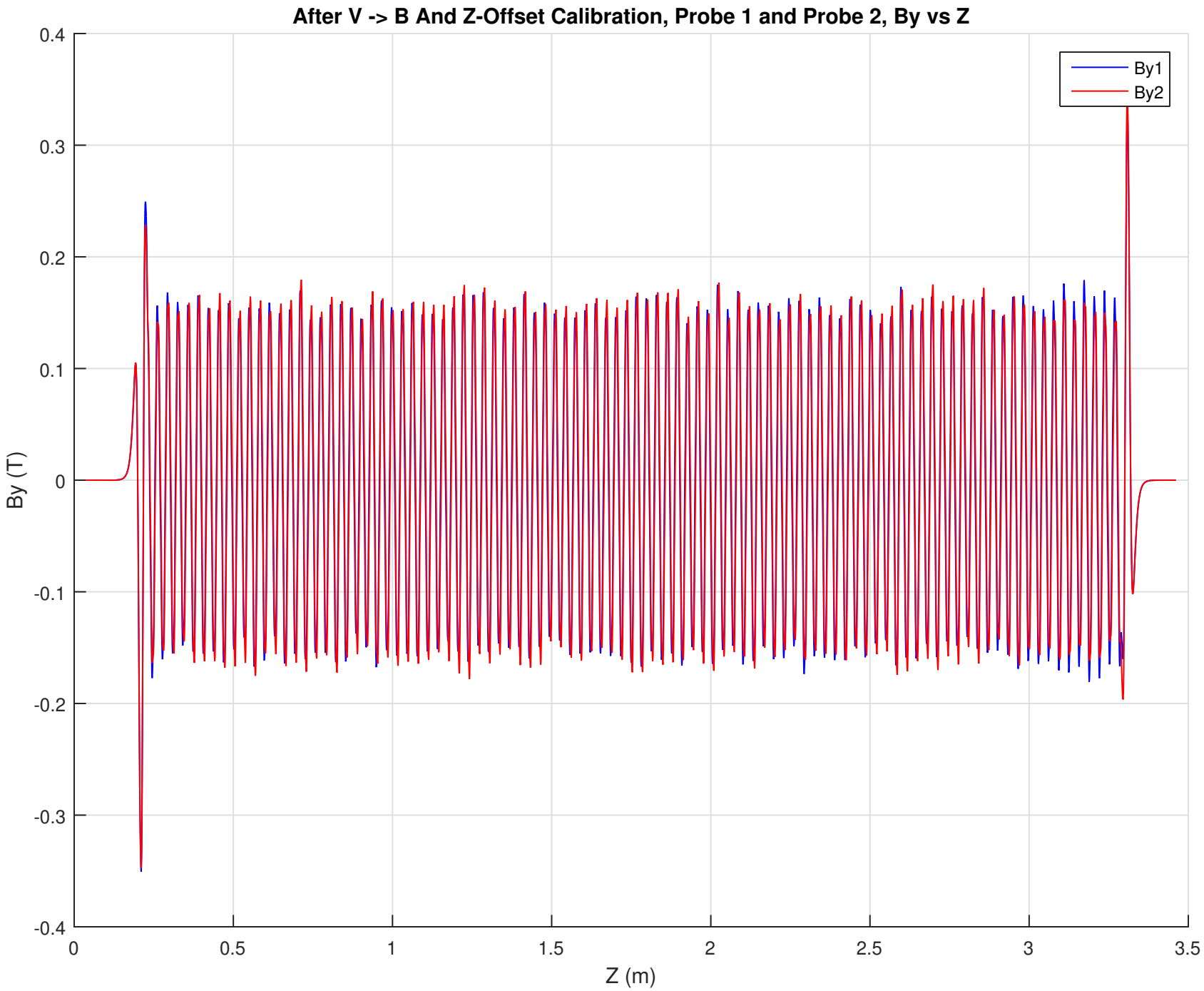

Probe 1 and Probe 2, Vz vs Z
Vz1
Vz2
Vz (V)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

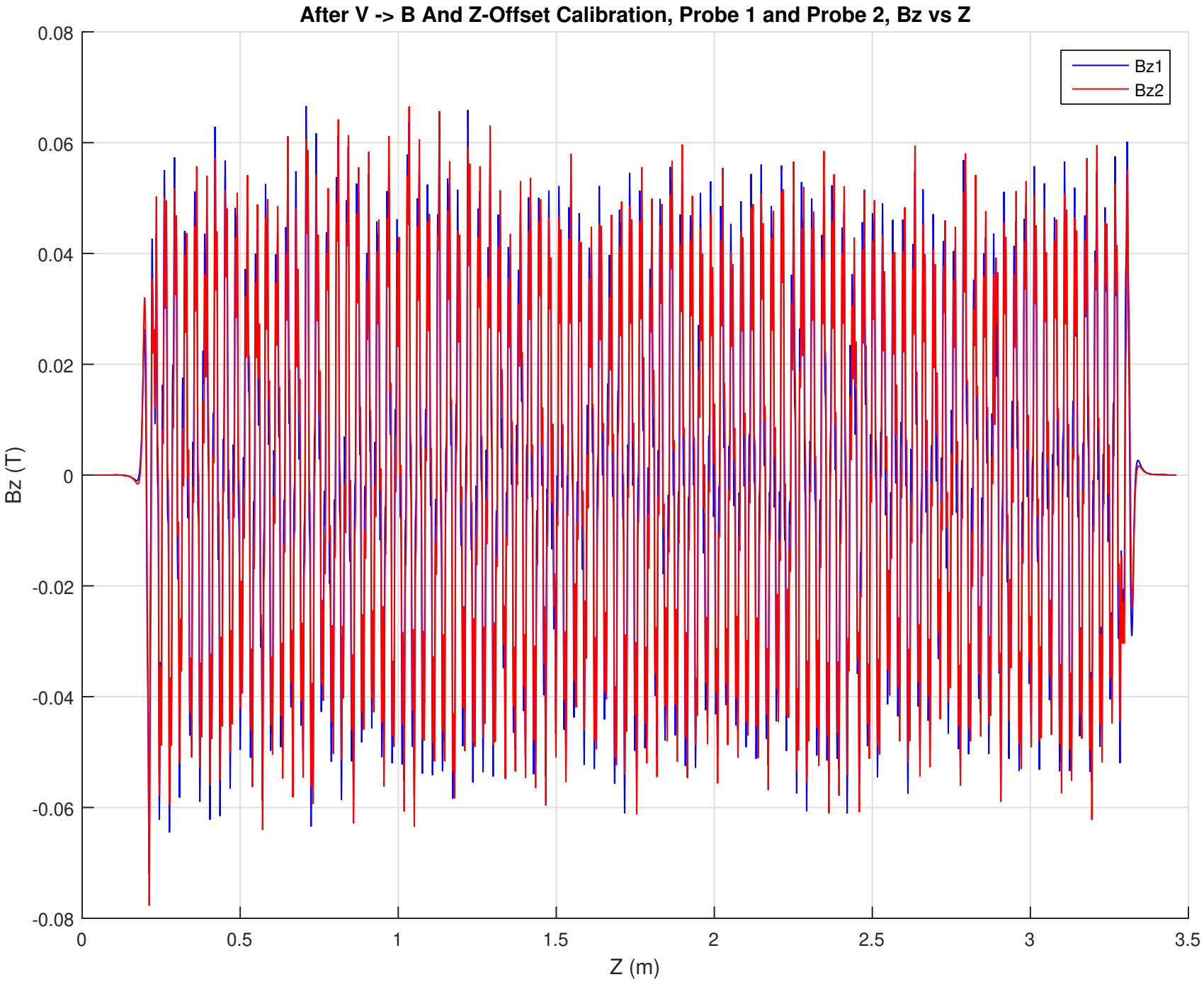

After V -> B Calibration, Probe 1 and Probe 2, Bx vs Z
Bx1
Bx2
Bx (T)
Z (m)
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
0
0.5
1
1.5
2
2.5
3
3.5

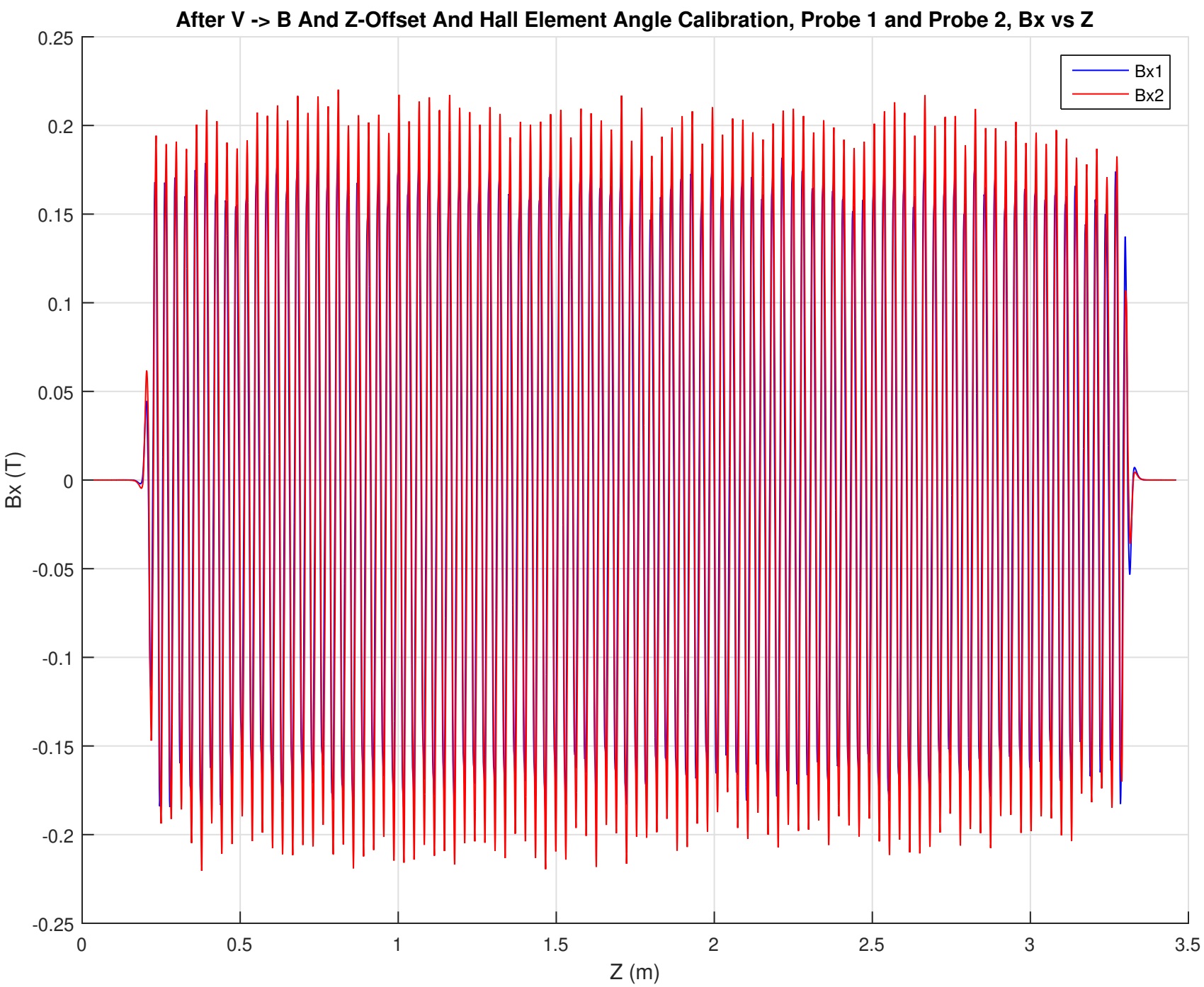

After V -> B Calibration, Probe 1 and Probe 2, By vs Z
By1
By2
By (T)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

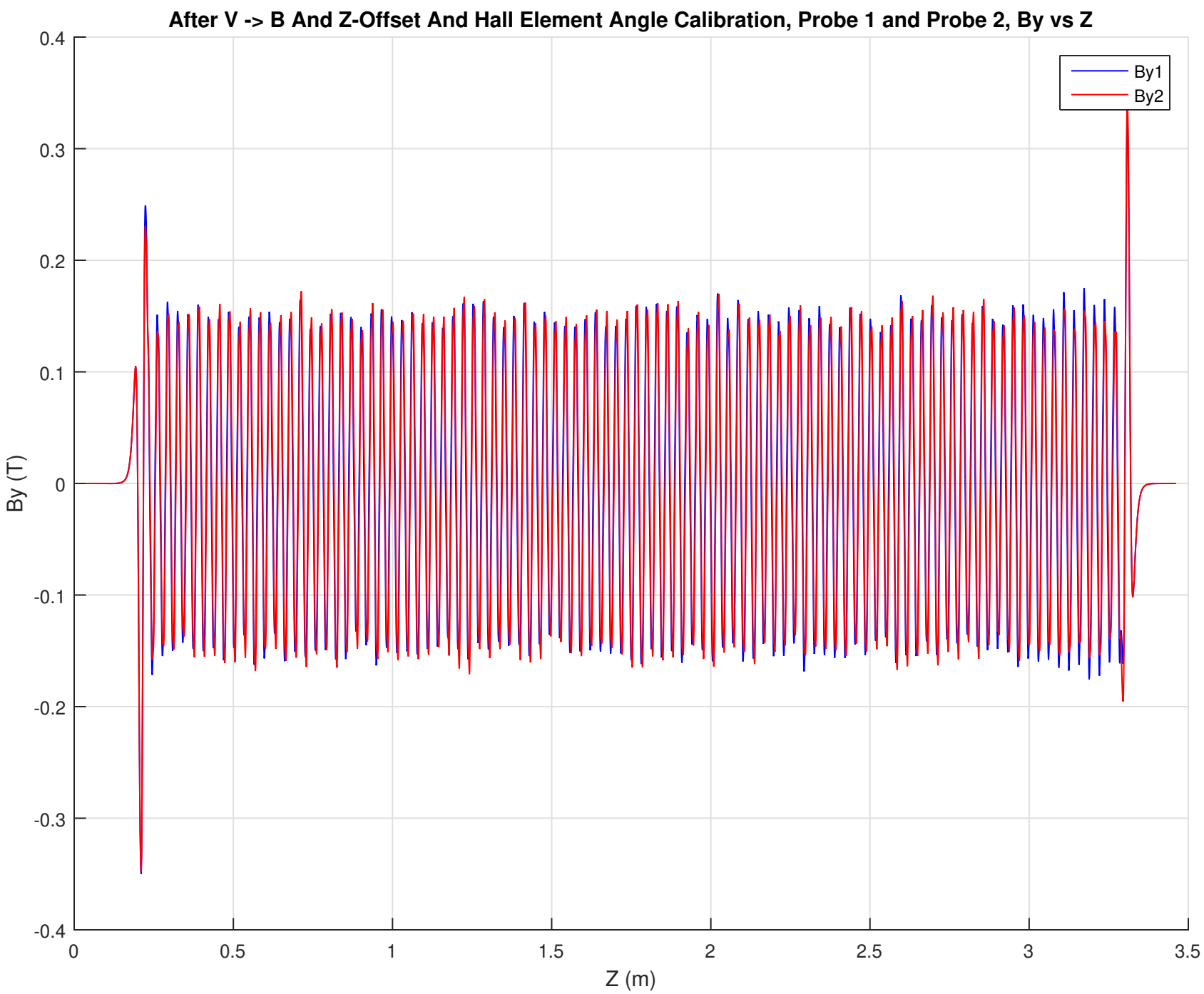

After V -> B Calibration, Probe 1 and Probe 2, Bz vs Z
Bz1
Bz2
Bz (T)
Z (m)
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
0
0.5
1
1.5
2
2.5
3
3.5

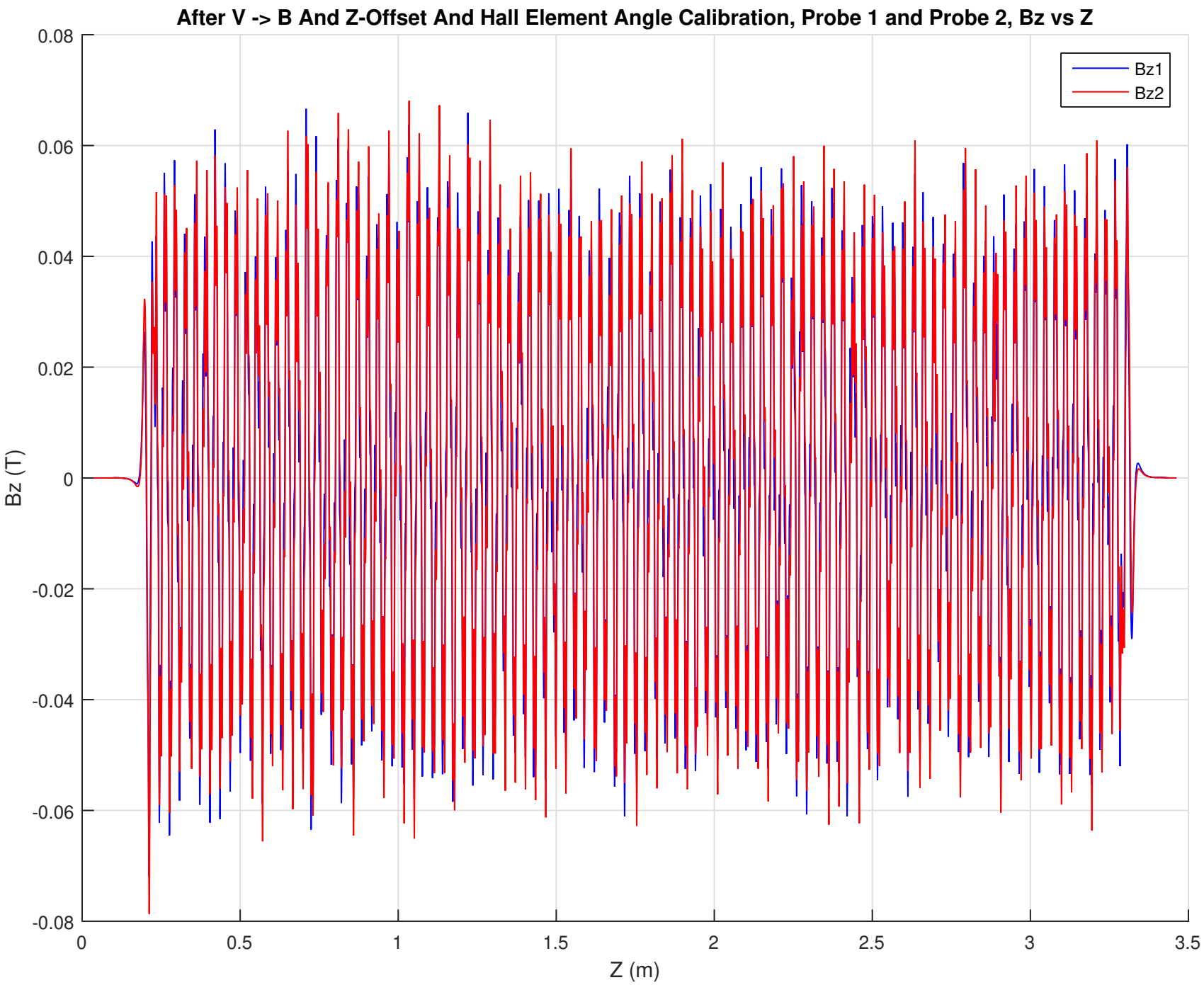

After V -> B And Z-Offset Calibration, Probe 1 and Probe 2, Bx vs Z
Bx1
Bx2
Bx (T)
Z (m)
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
0
0.5
1
1.5
2
2.5
3
3.5

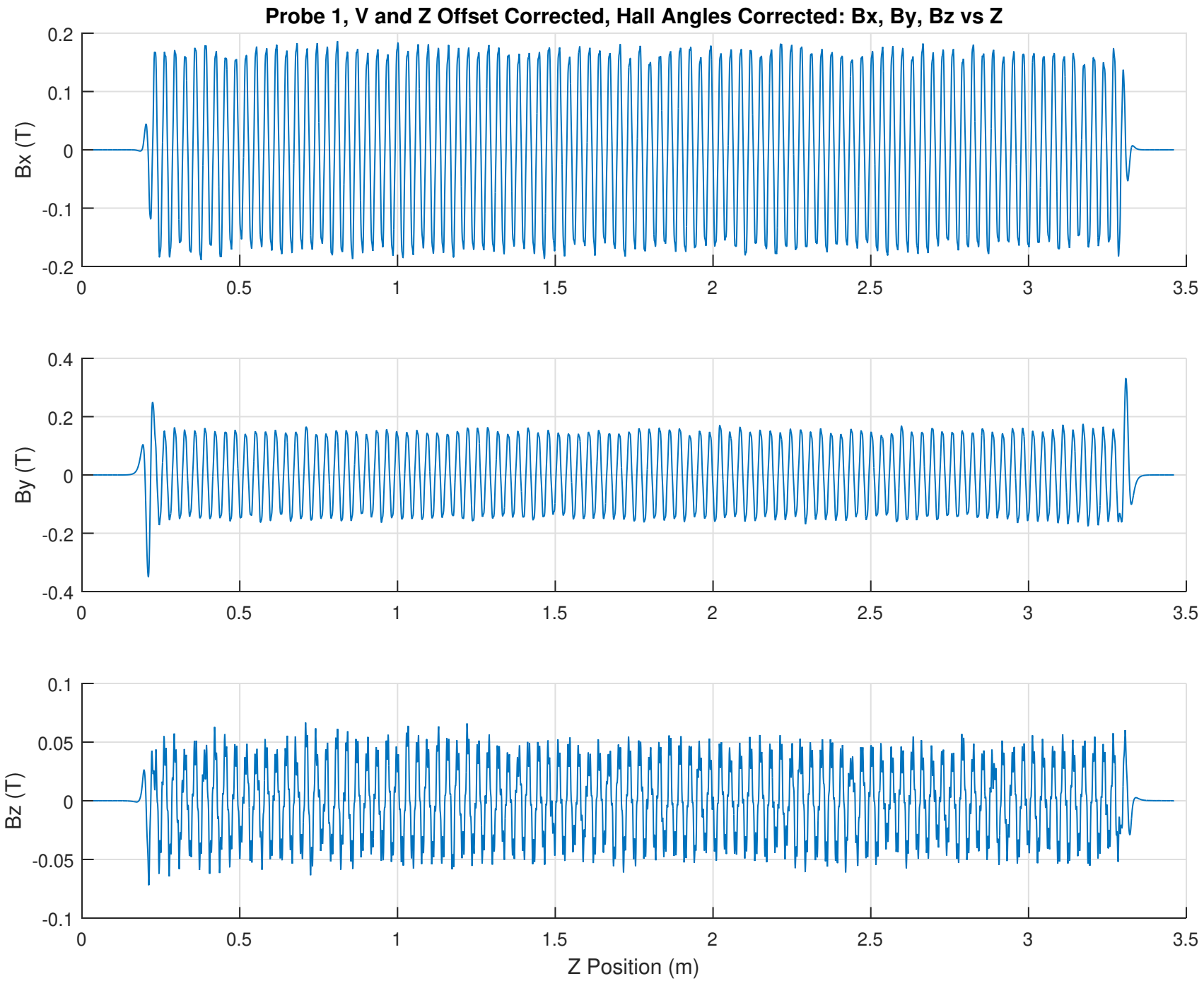

After V -> B And Z-Offset Calibration, Probe 1 and Probe 2, By vs Z
By1
By2
By (T)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

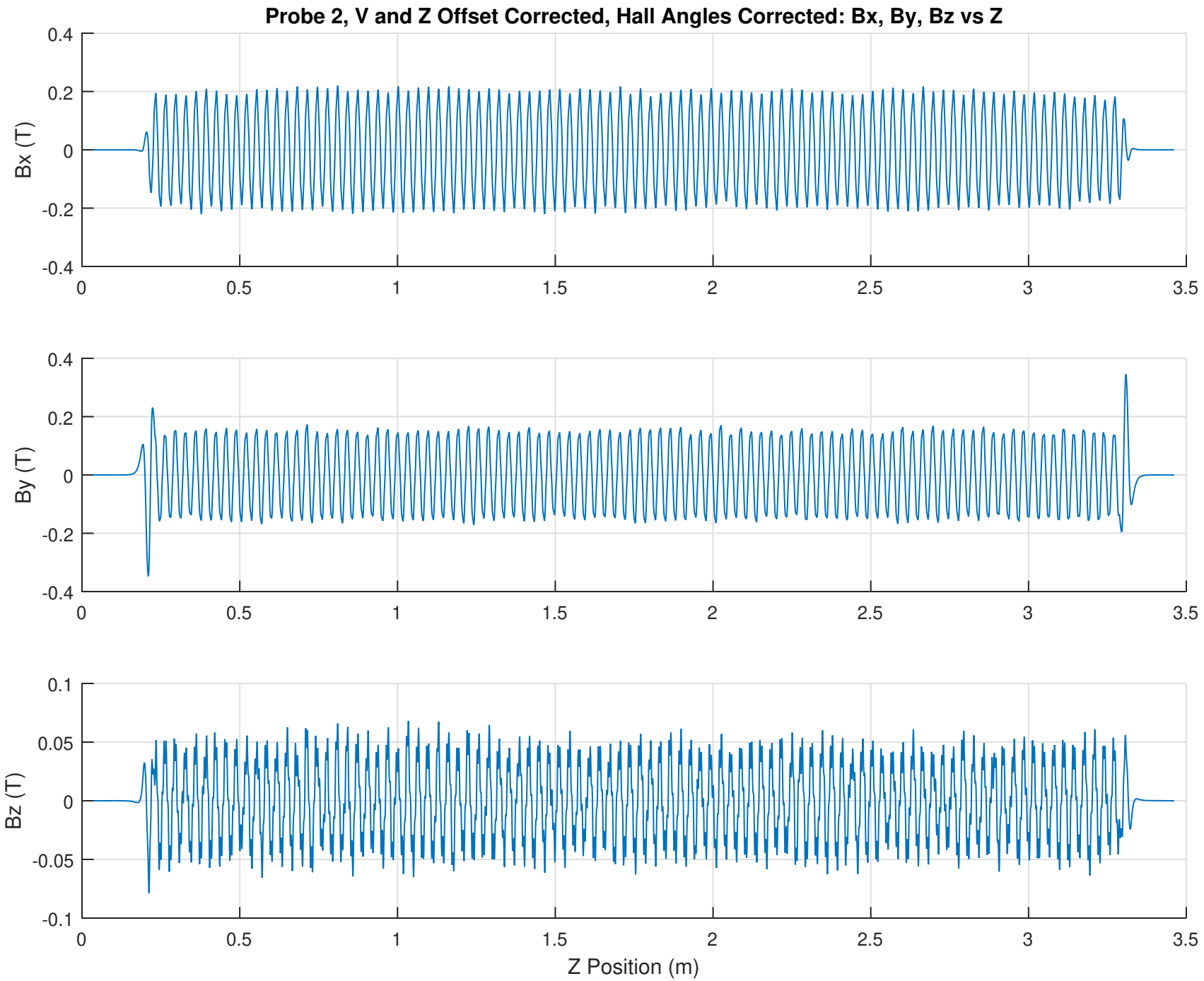

After V -> B And Z-Offset Calibration, Probe 1 and Probe 2, Bz vs Z
Bz1
Bz2
Bz (T)
Z (m)
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
0
0.5
1
1.5
2
2.5
3
3.5

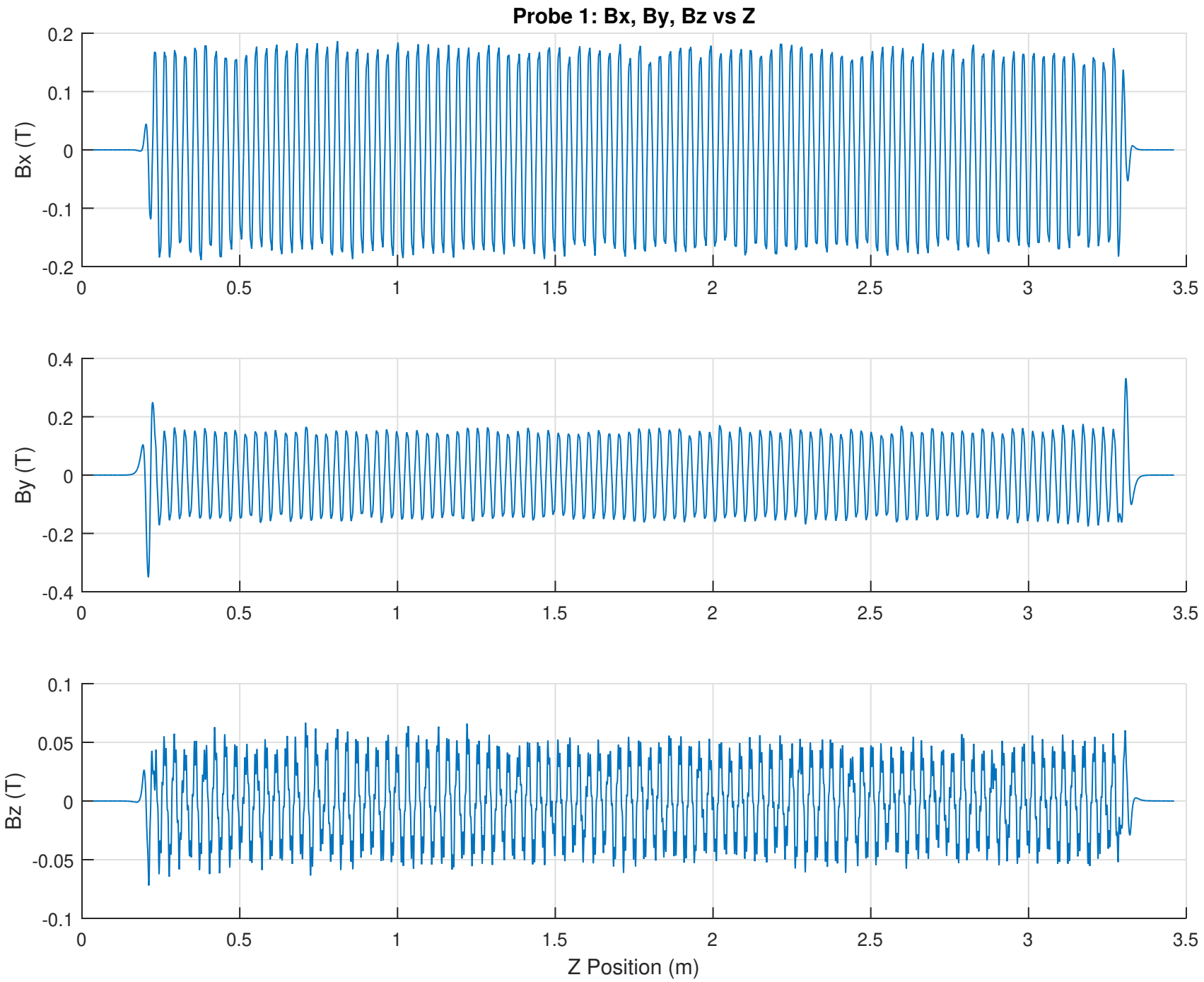

After V -> B And Z-Offset And Hall Element Angle Calibration, Probe 1 and Probe 2, Bx vs Z
Bx1
Bx2
Bx (T)
Z (m)
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
0
0.5
1
1.5
2
2.5
3
3.5

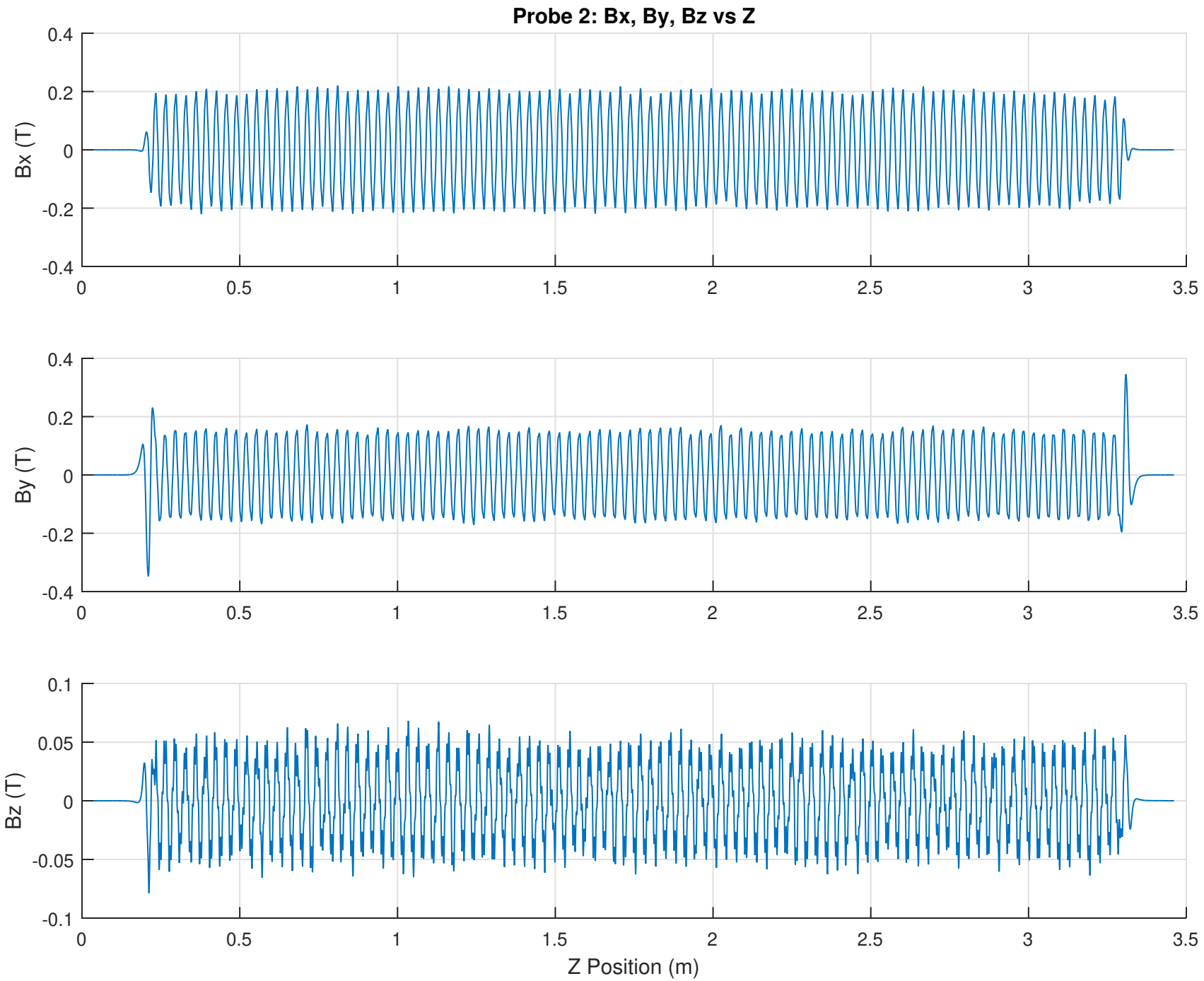

After V -> B And Z-Offset And Hall Element Angle Calibration, Probe 1 and Probe 2, By vs Z
By1
By2
By (T)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

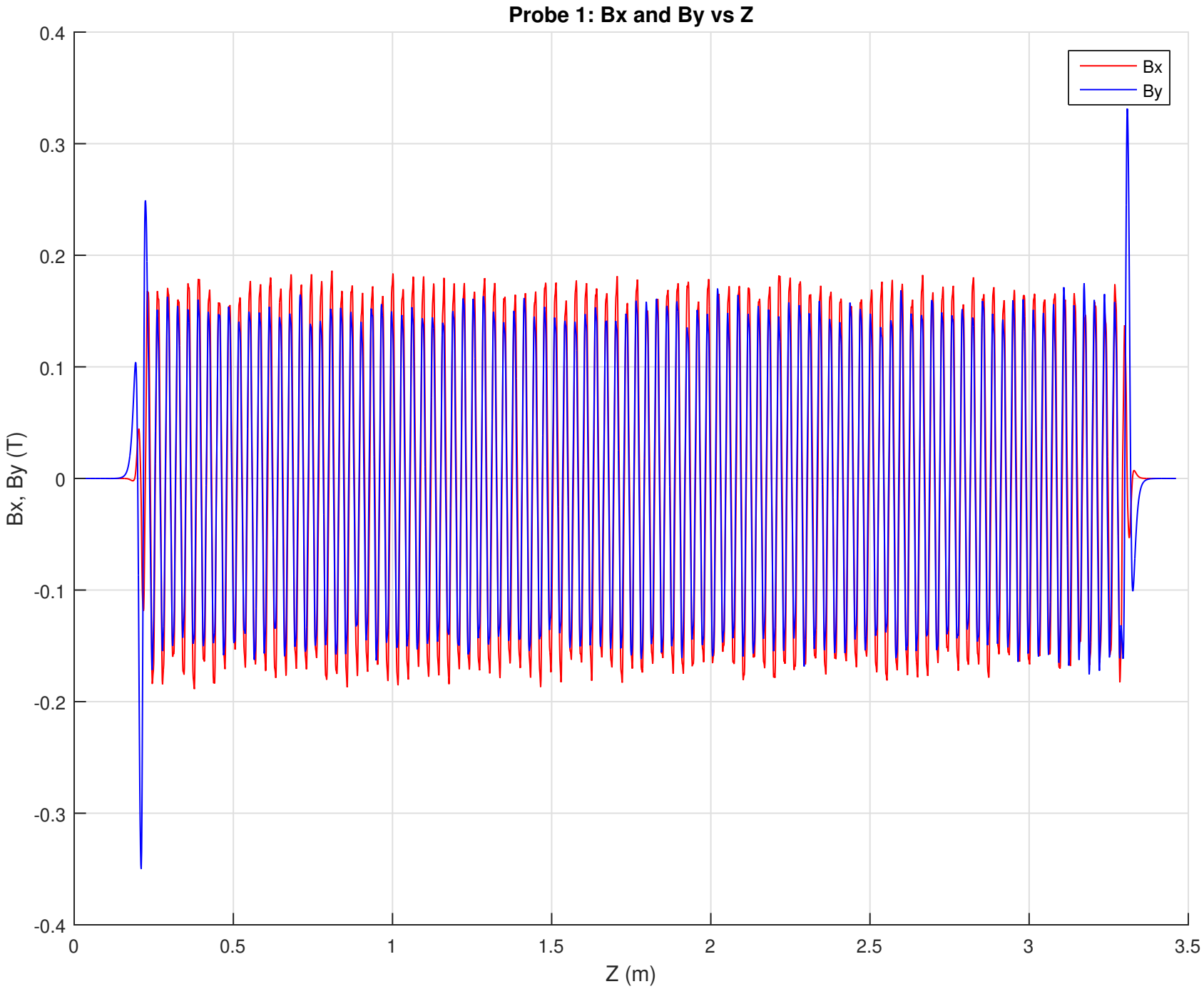

After V -> B And Z-Offset And Hall Element Angle Calibration, Probe 1 and Probe 2, Bz vs Z
Bz1
Bz2
Bz (T)
Z (m)
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
0
0.5
1
1.5
2
2.5
3
3.5

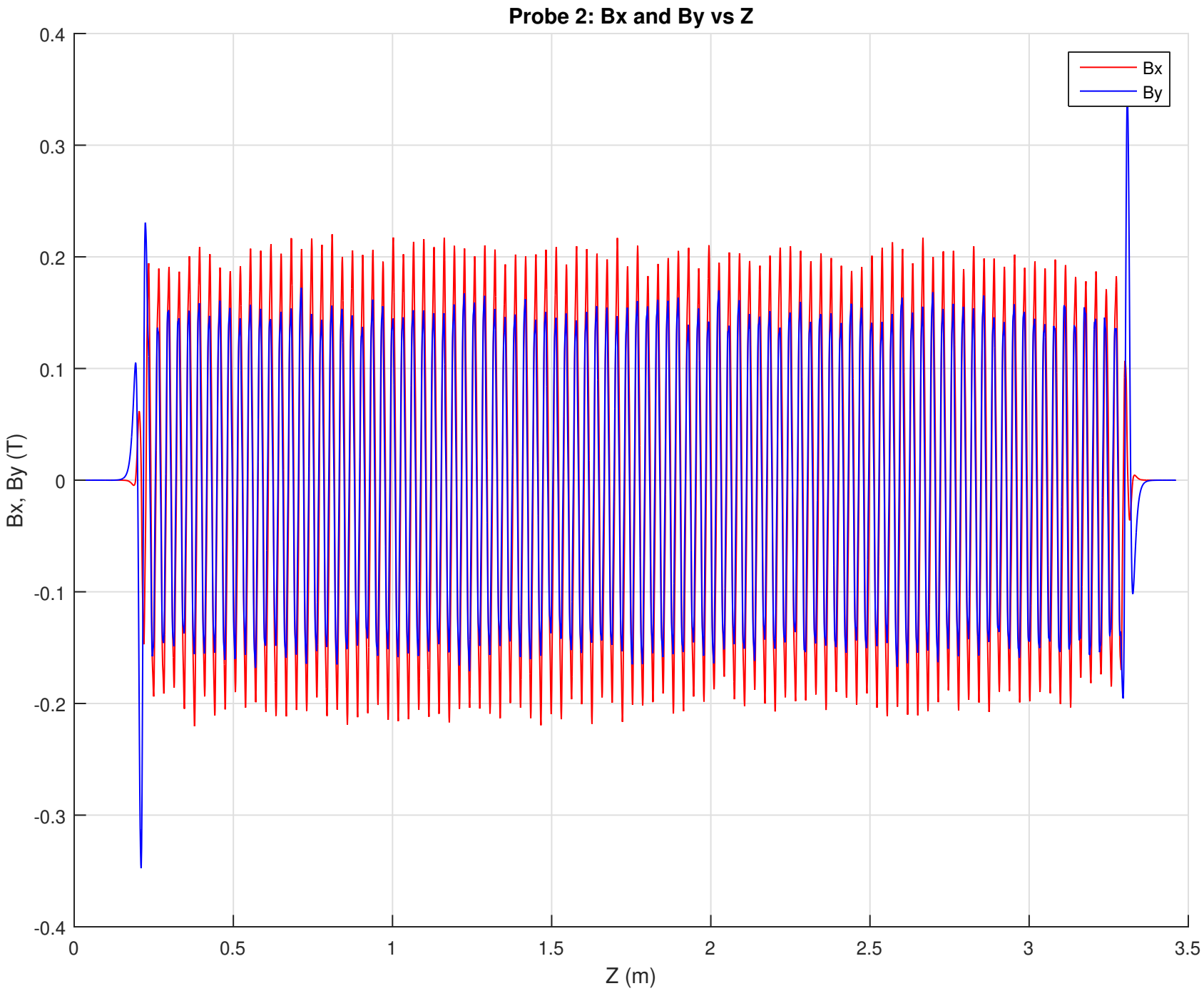

Probe 1, V and Z Offset Corrected, Hall Angles Corrected: Bx, By, Bz vs Z
Bx (T)
0.2
0.1
0
-0.1
-0.2
By (T)
0.4
0.2
0
-0.2
-0.4
Bz (T)
0.1
0.05
0
-0.05
-0.1
0
0.5
1
1.5
2
2.5
3
3.5
Z Position (m)

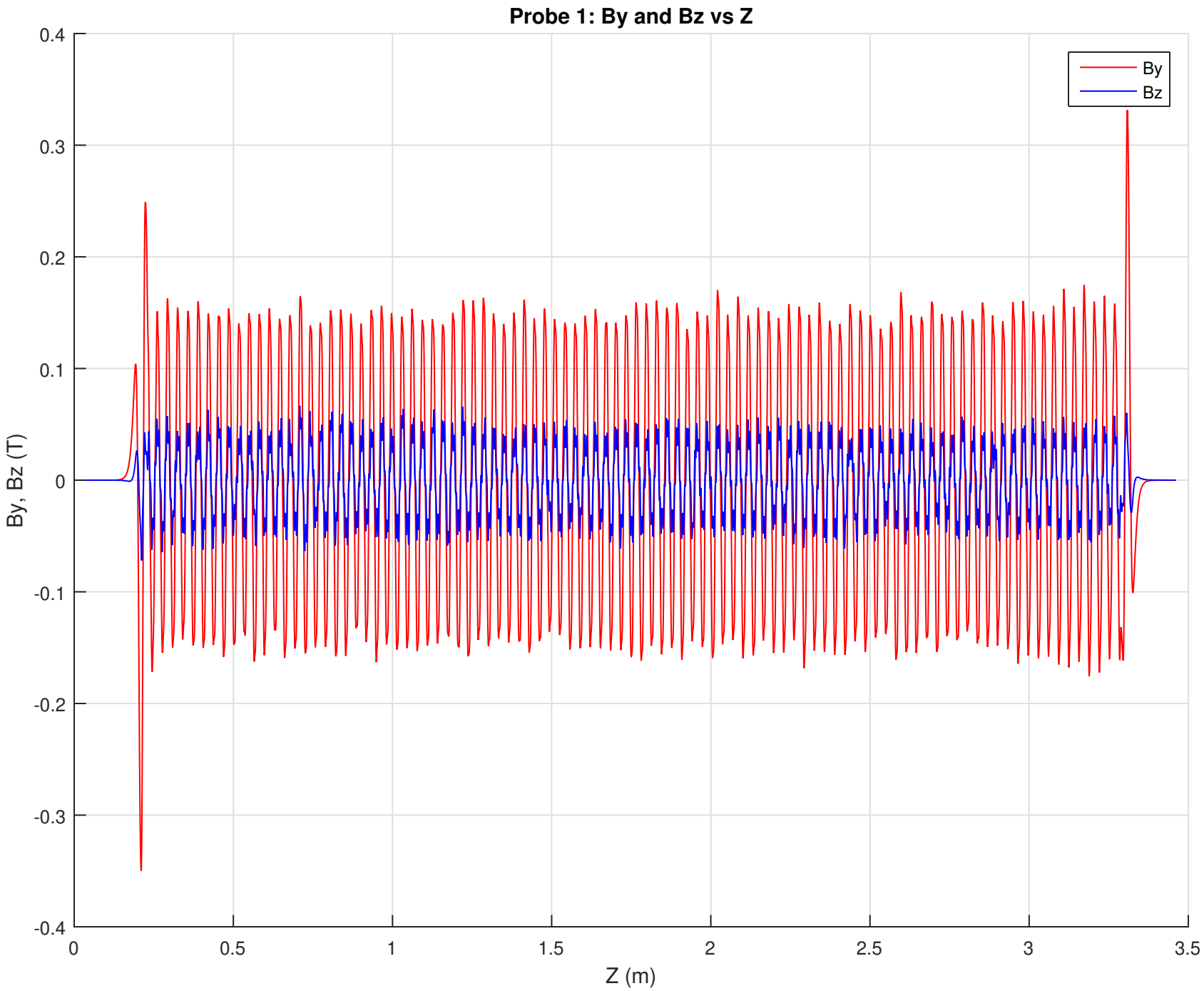

Probe 2, V and Z Offset Corrected, Hall Angles Corrected: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
Z Position (m)
0.4
0.2
0
-0.2
-0.4
0.1
0.05
-0.05
-0.1
0
0.5
1
1.5
2
2.5
3
3.5

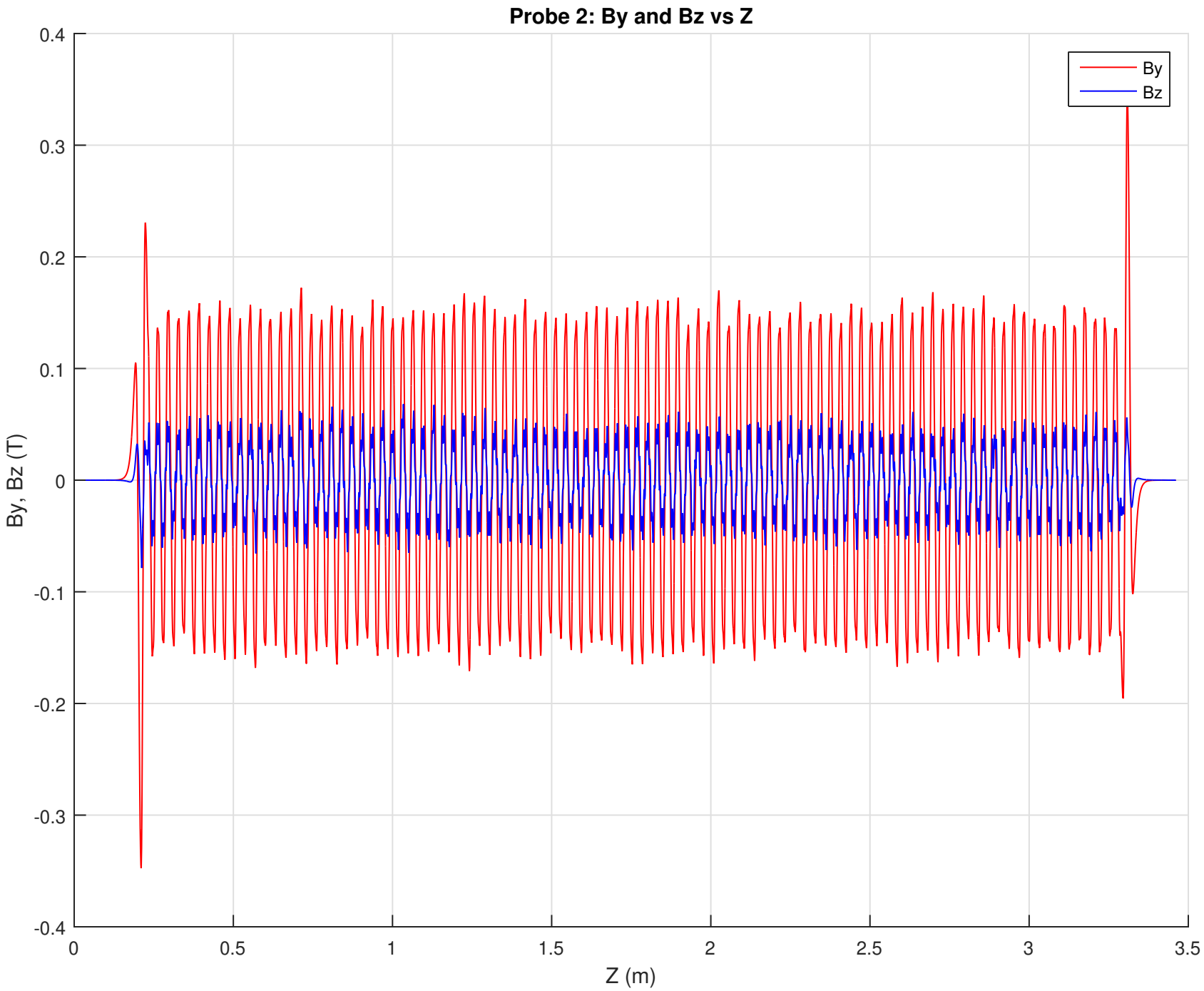

Probe 1: Bx, By, Bz vs Z
Bx (T)
0.2
0.1
0
-0.1
-0.2
By (T)
0.4
0.2
0
-0.2
-0.4
Bz (T)
0.1
0.05
0
-0.05
-0.1
0
0.5
1
1.5
2
2.5
3
3.5
Z Position (m)

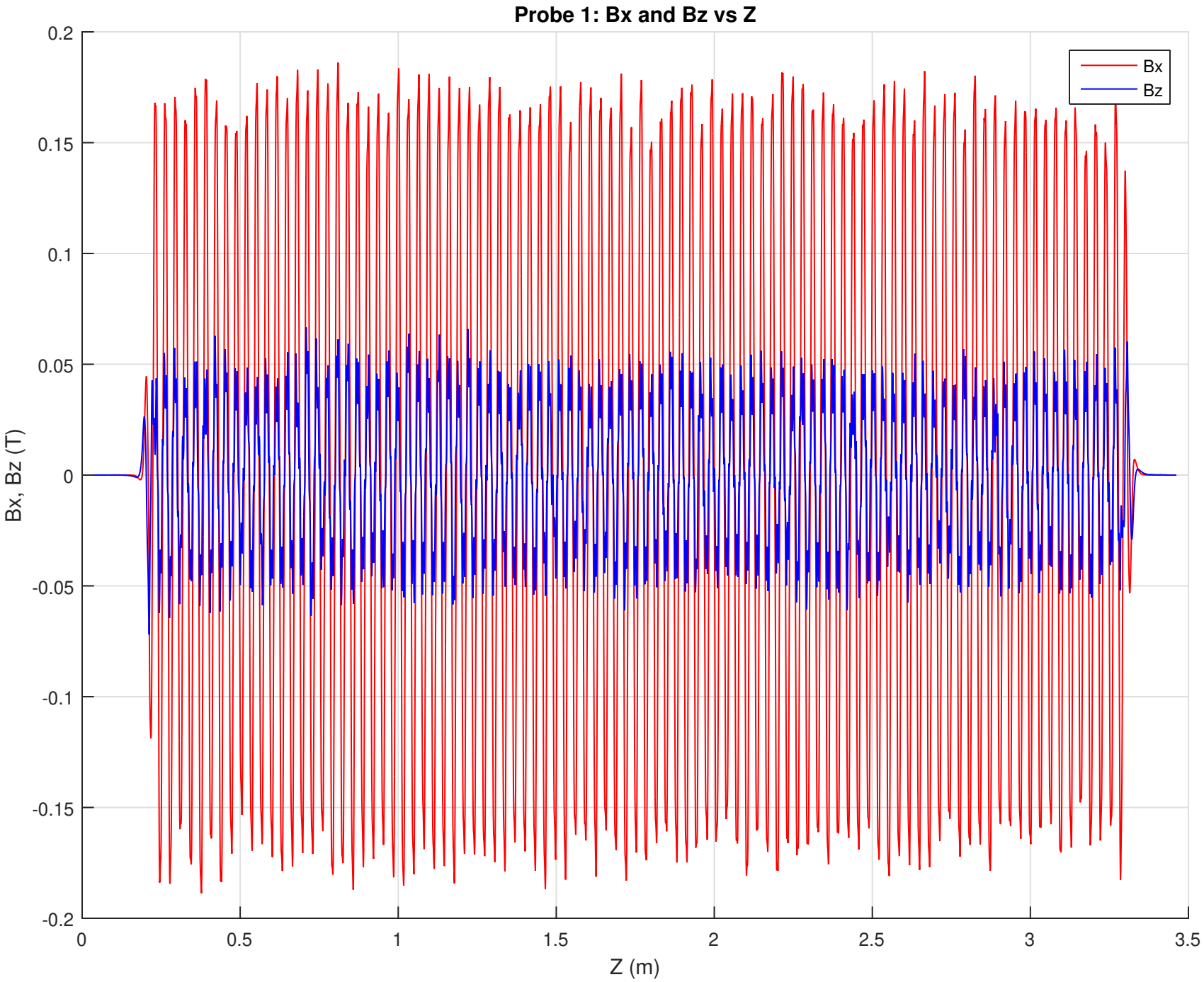

Probe 2: Bx, By, Bz vs Z
Bx (T)
By (T)
Bz (T)
Z Position (m)
0.4
0.2
0
-0.2
-0.4
0.1
0.05
-0.05
-0.1
0
0.5
1
1.5
2
2.5
3
3.5

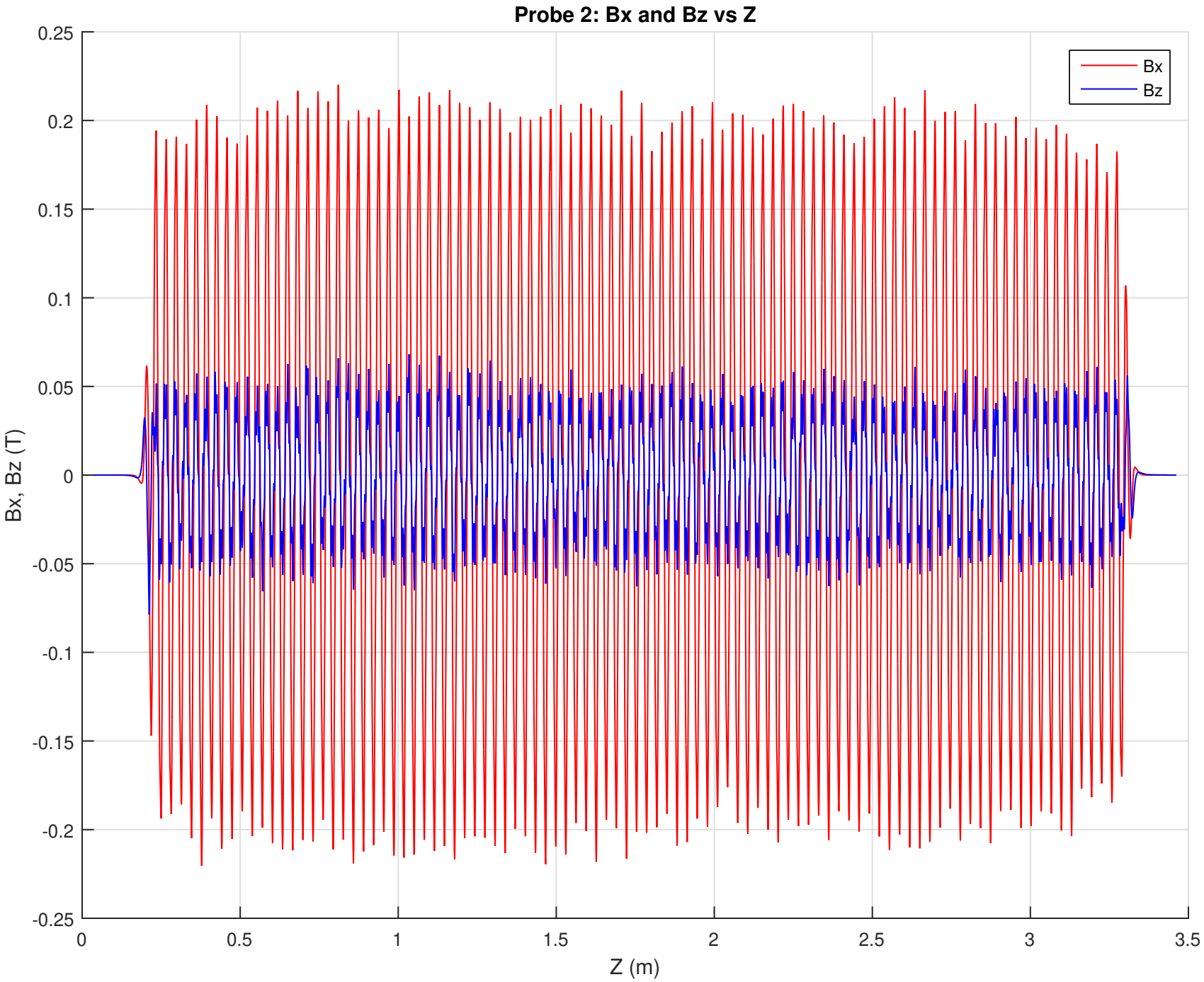

Probe 1: Bx and By vs Z
Bx
By
Bx, By (T)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

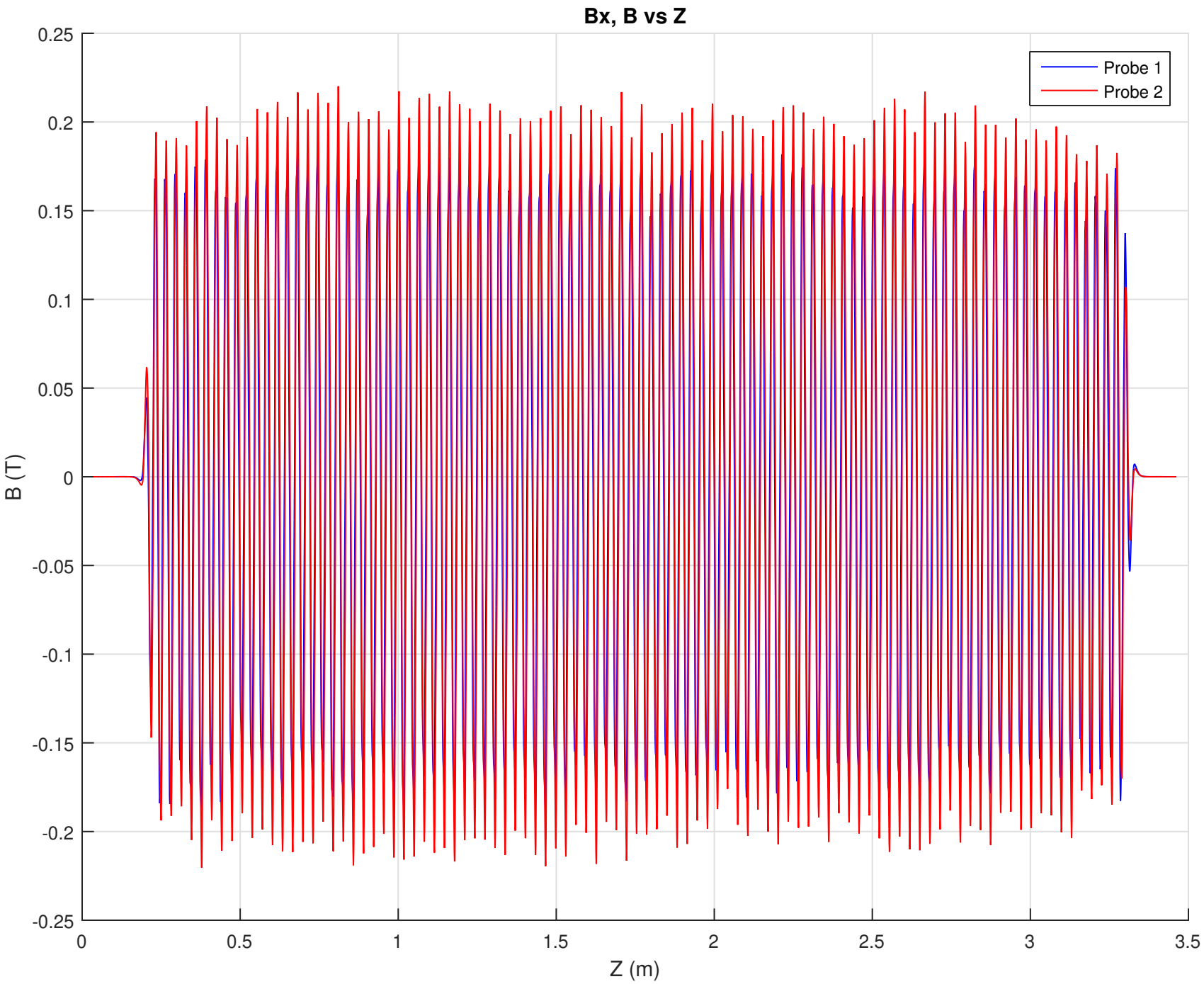

Probe 2: Bx and By vs Z
Bx
By
Bx, By (T)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

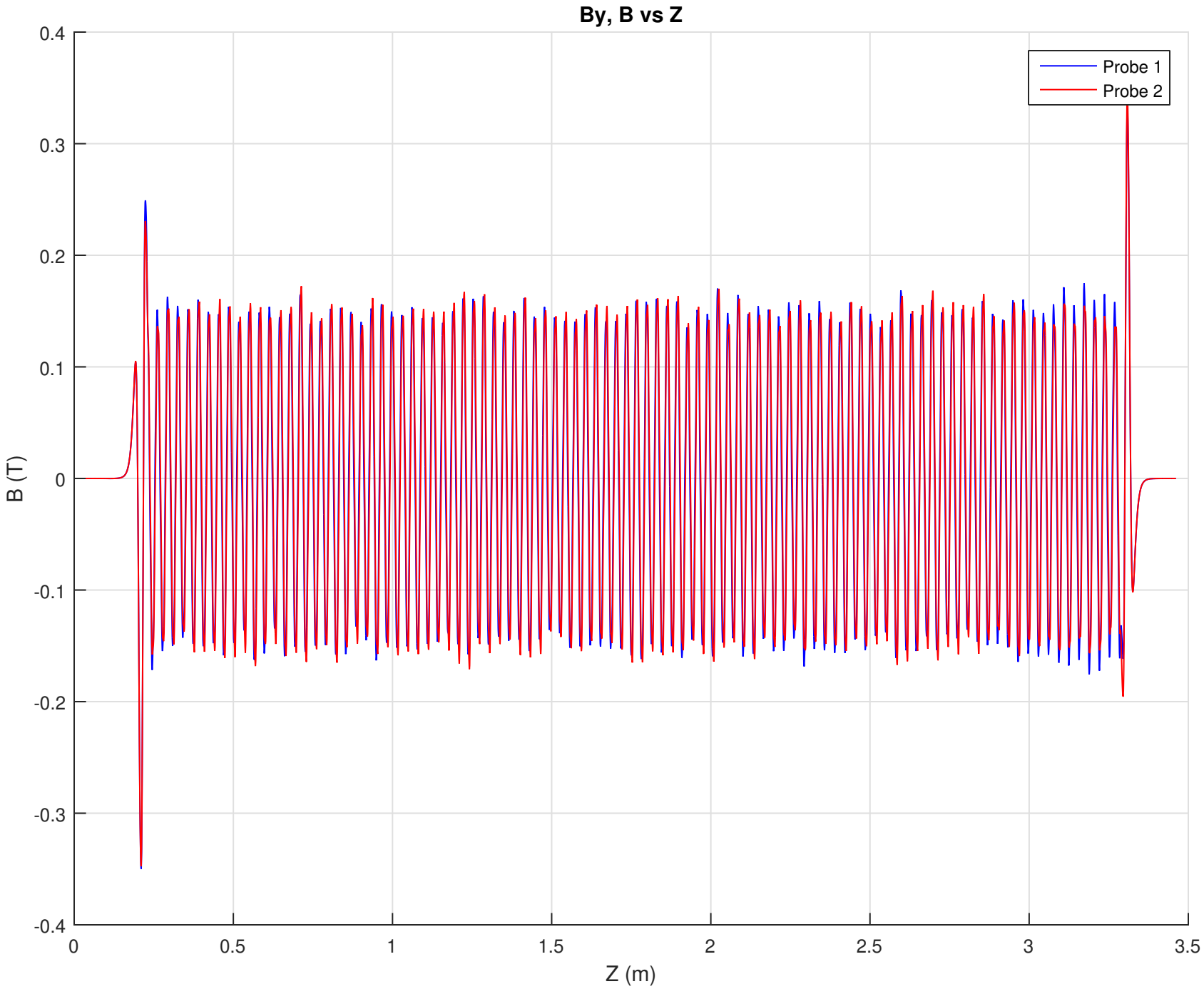

Probe 1: By and Bz vs Z
By
Bz
By, Bz (T)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

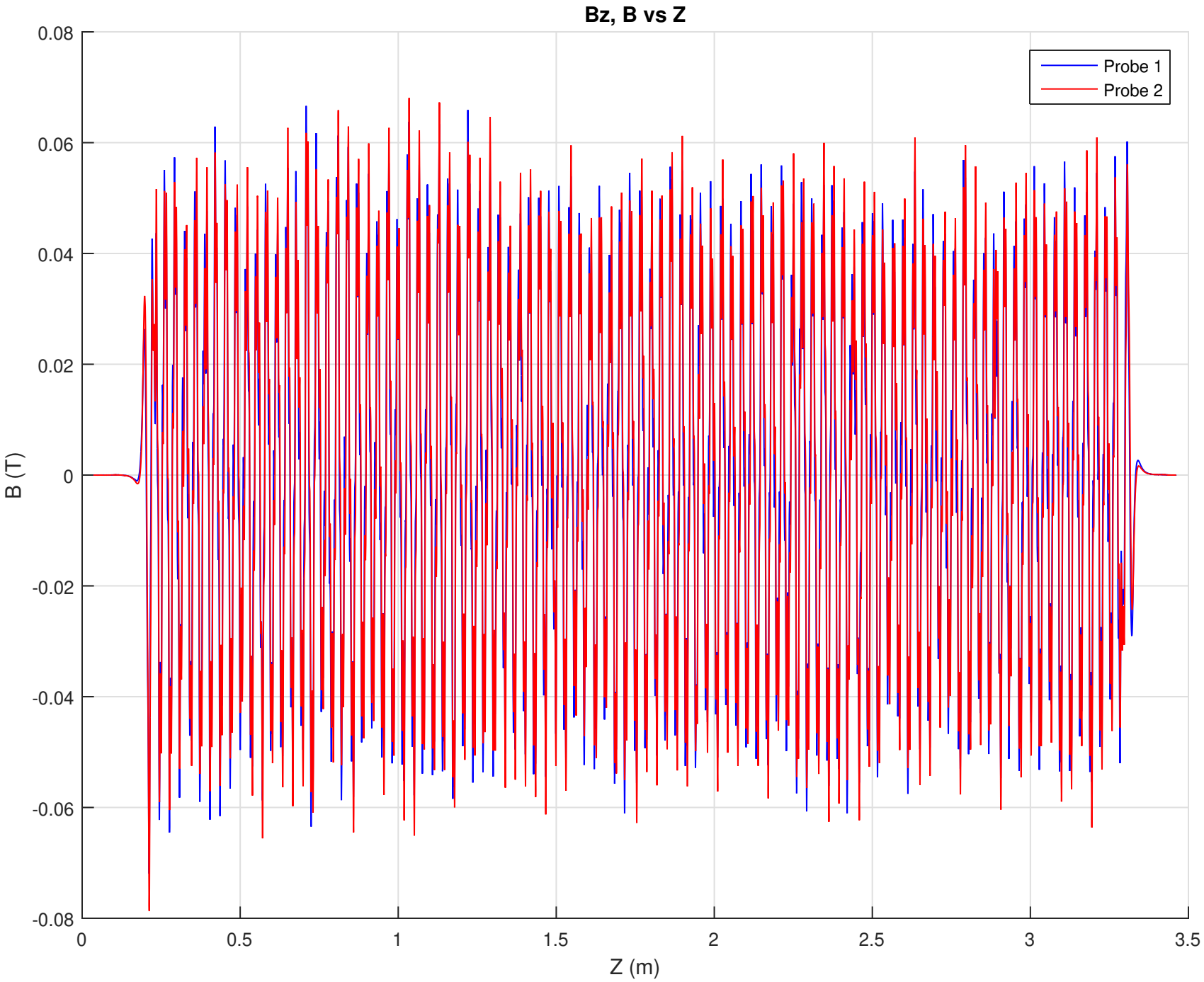

Probe 2: By and Bz vs Z
By
Bz
By, Bz (T)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

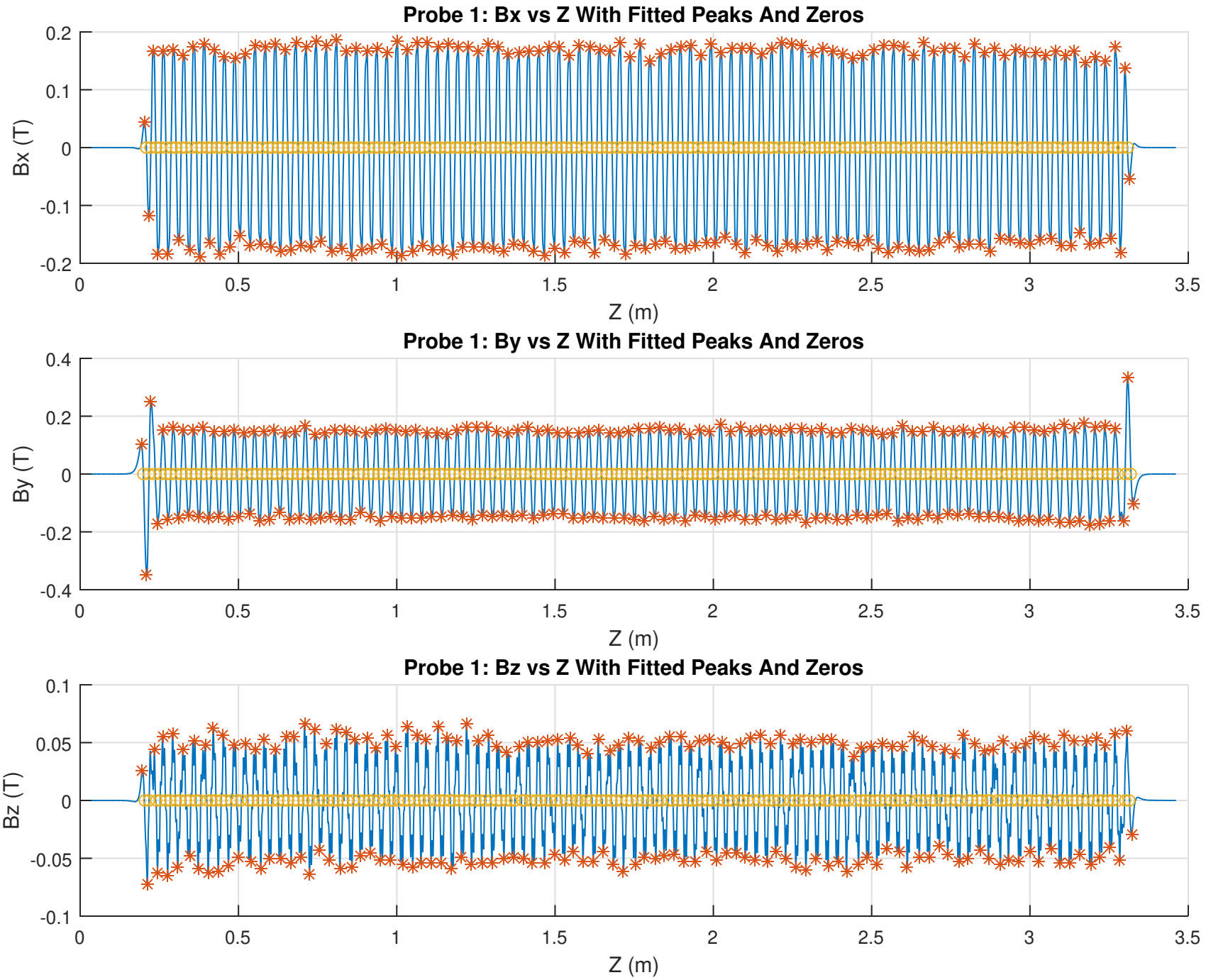

Probe 1: Bx and Bz vs Z
Bx
Bz
Bx, Bz (T)
Z (m)
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
0
0.5
1
1.5
2
2.5
3
3.5

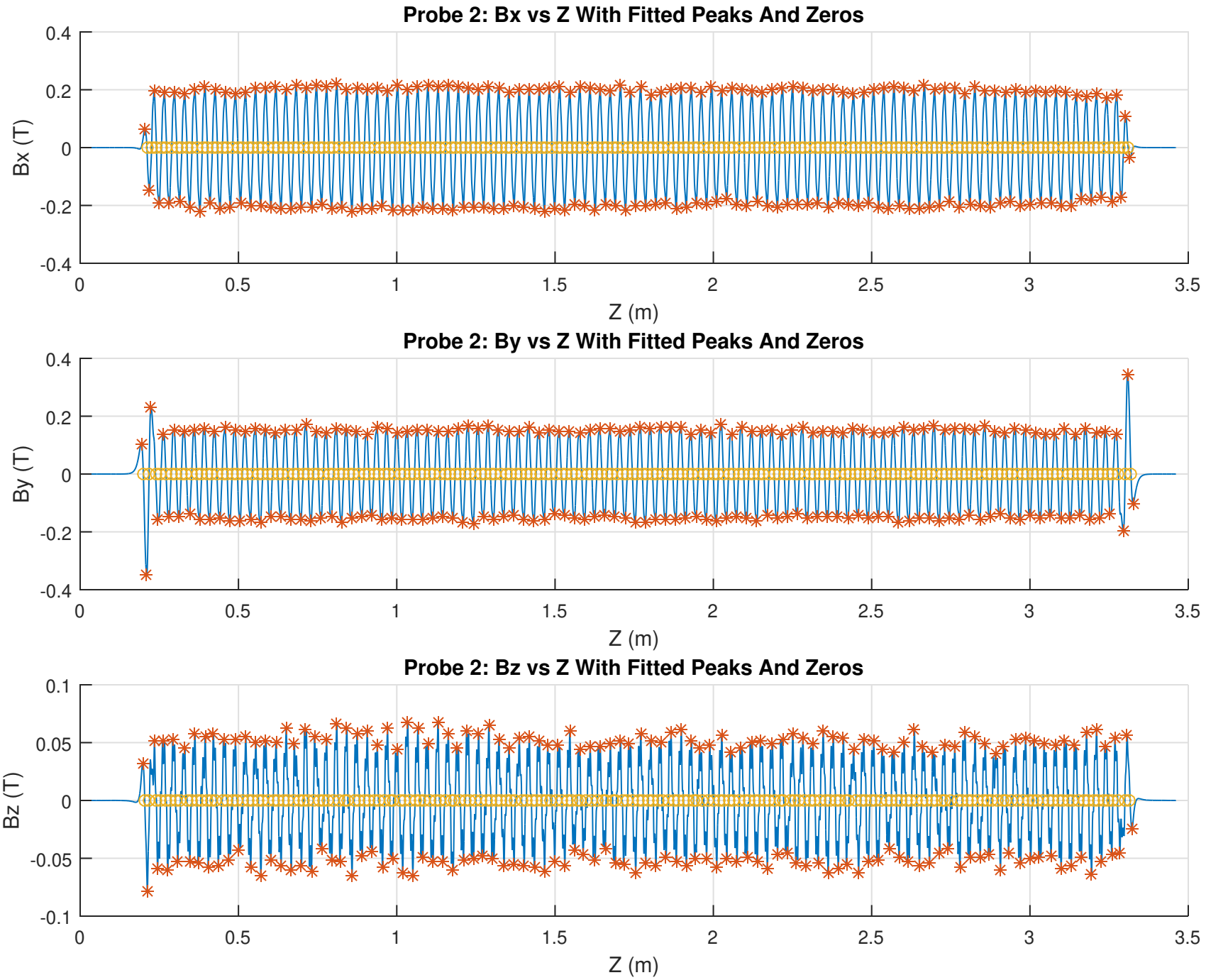

Probe 2: Bx and Bz vs Z
Bx
Bz
Bx, Bz (T)
Z (m)
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
0
0.5
1
1.5
2
2.5
3
3.5

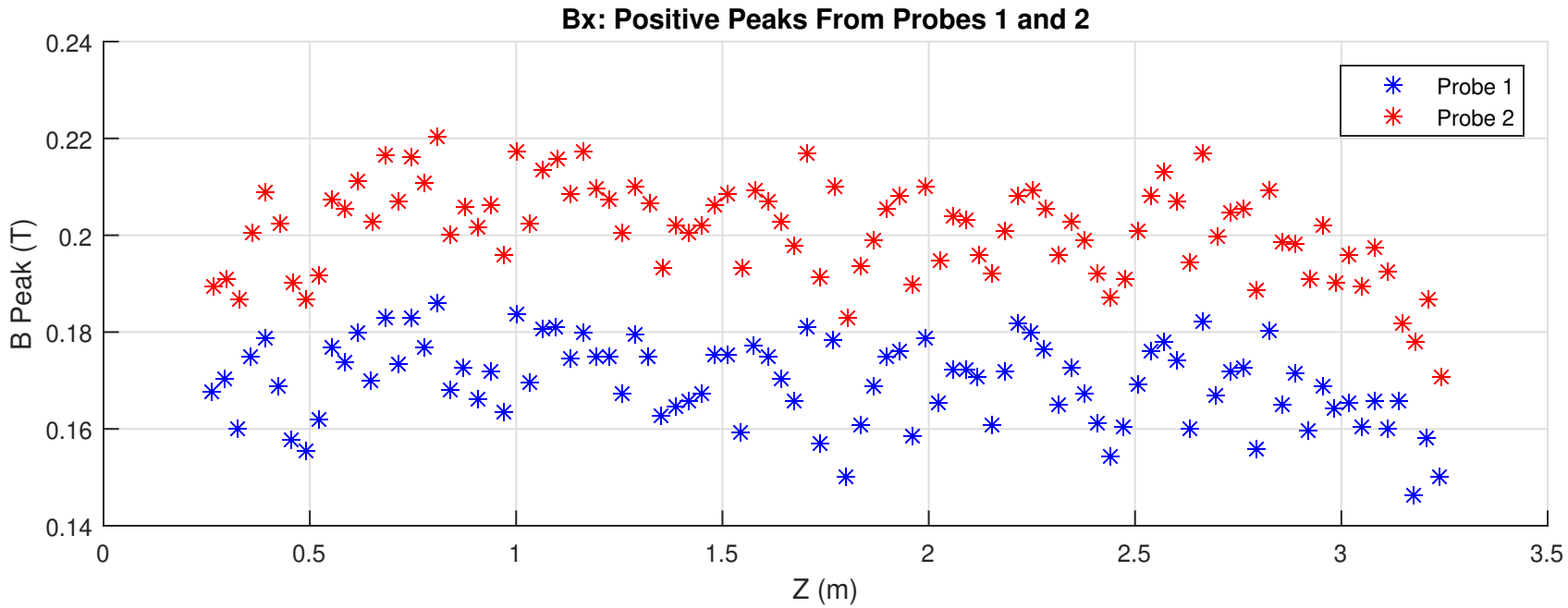

Bx, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
0
0.5
1
1.5
2
2.5
3
3.5

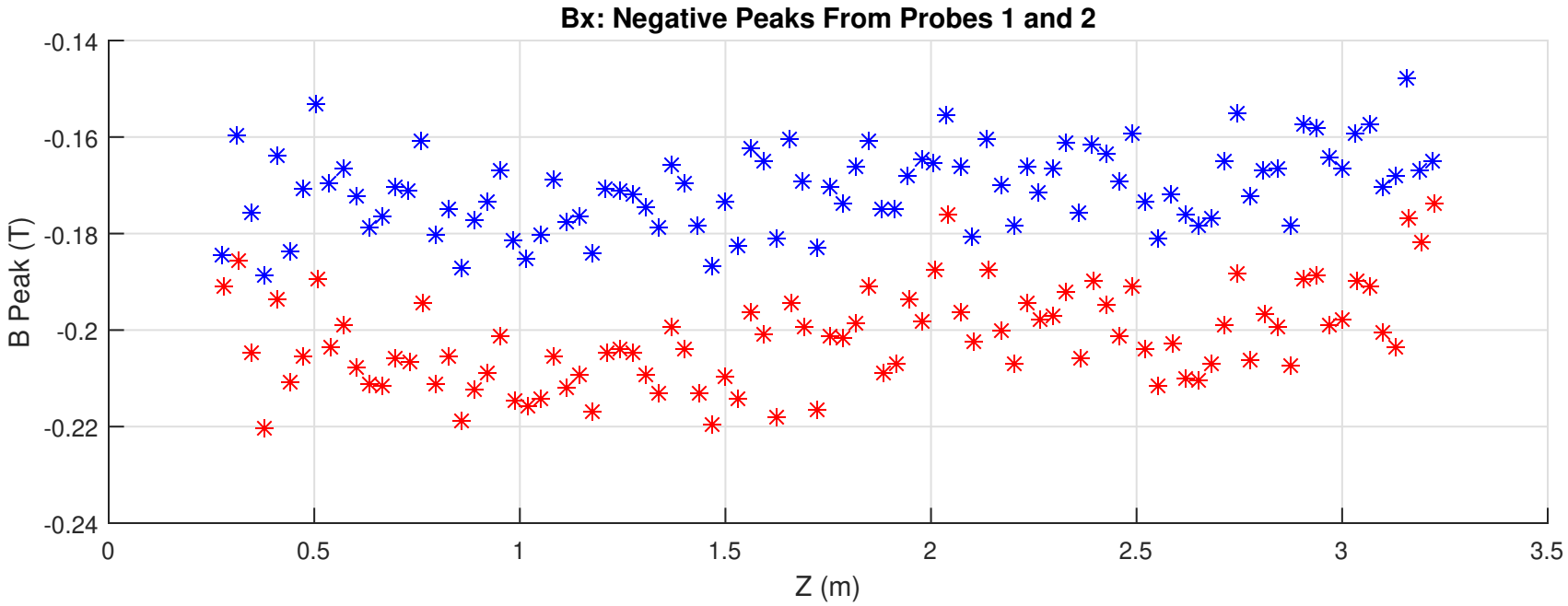

By, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
0
0.5
1
1.5
2
2.5
3
3.5

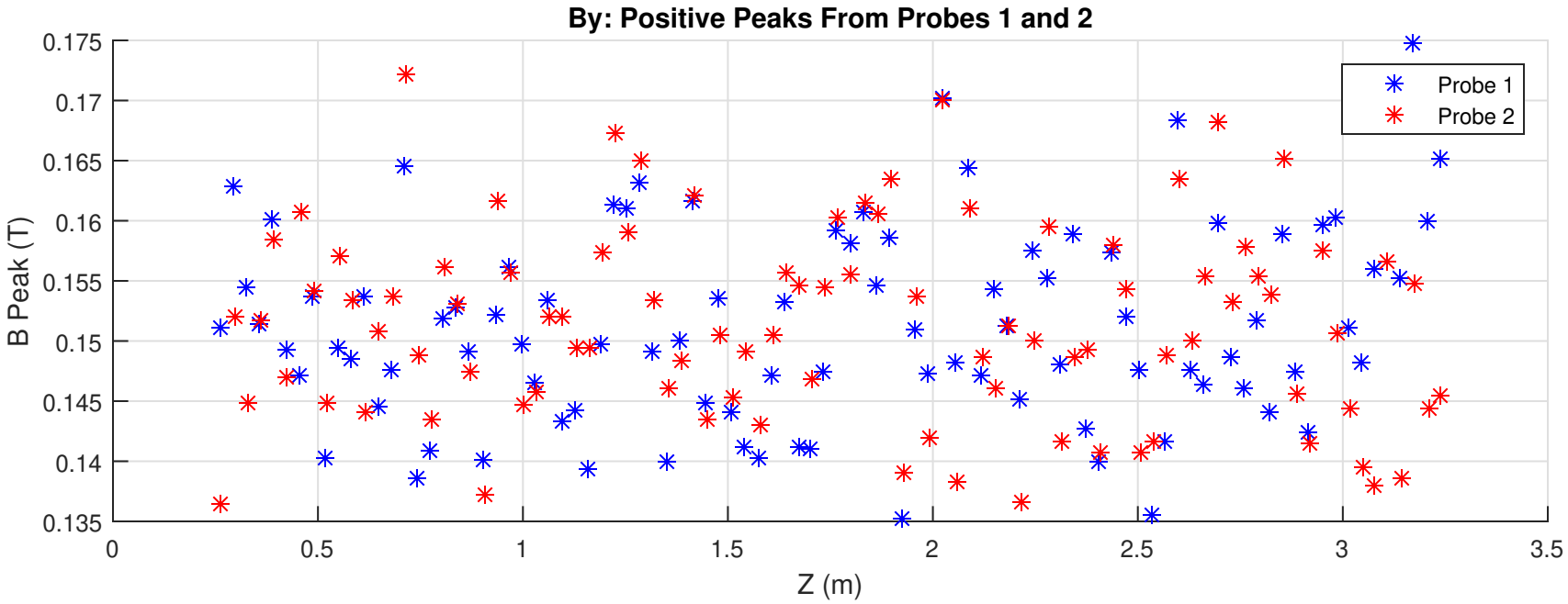

Bz, B vs Z
Probe 1
Probe 2
B (T)
Z (m)
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
0
0.5
1
1.5
2
2.5
3
3.5

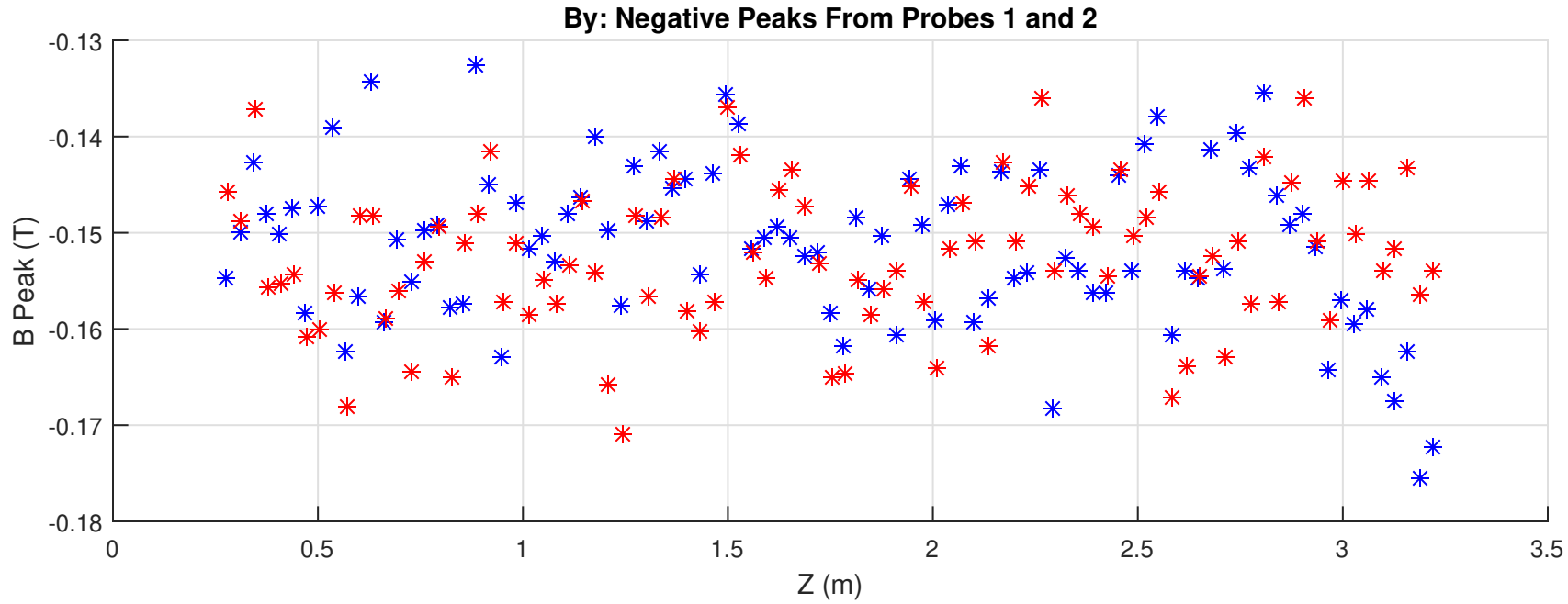

Probe 1: Bx vs Z With Fitted Peaks And Zeros
Bx (T)
0.2
0.1
0
-0.1
-0.2
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)
Probe 1: By vs Z With Fitted Peaks And Zeros
By (T)
0.4
0.2
0
-0.2
-0.4
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)
Probe 1: Bz vs Z With Fitted Peaks And Zeros
Bz (T)
0.1
0.05
0
-0.05
-0.1
0
0.5
1
1.5
2
2.5
3
3.5
Z (m)

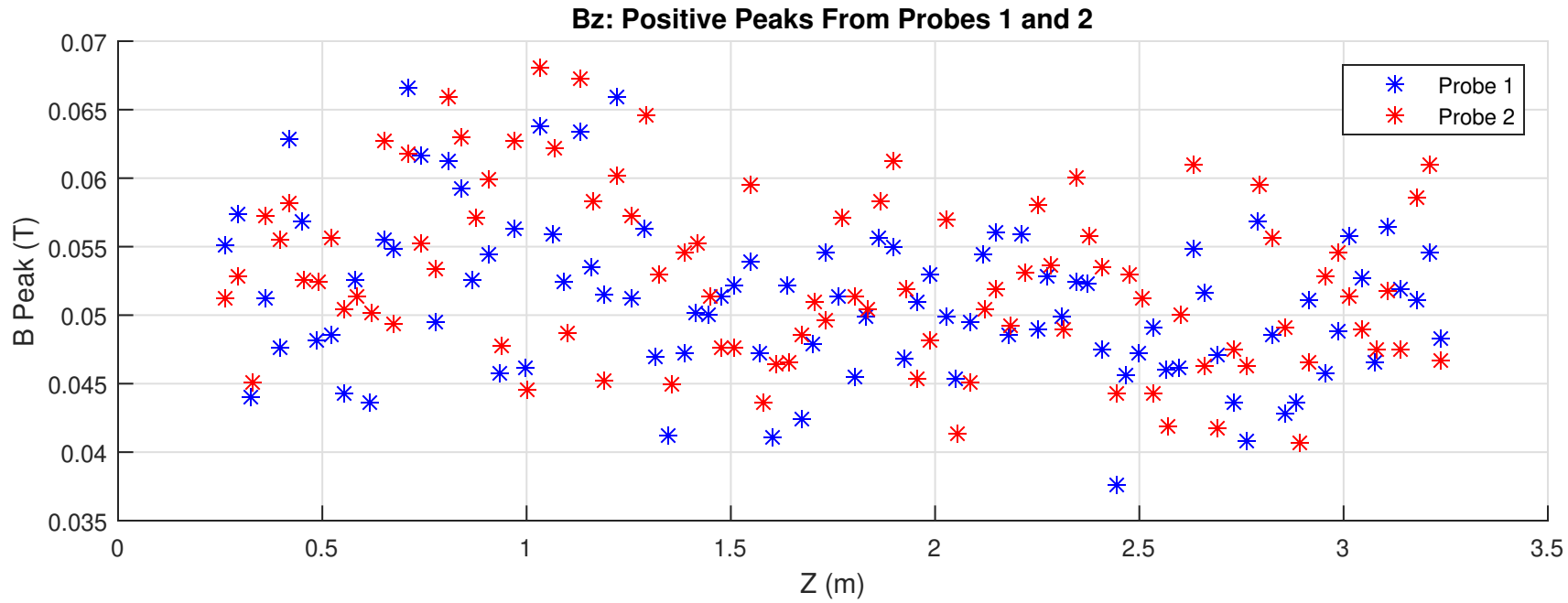

Probe 2: Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
Probe 2: By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
Probe 2: Bz vs Z With Fitted Peaks And Zeros
Bz (T)
Z (m)

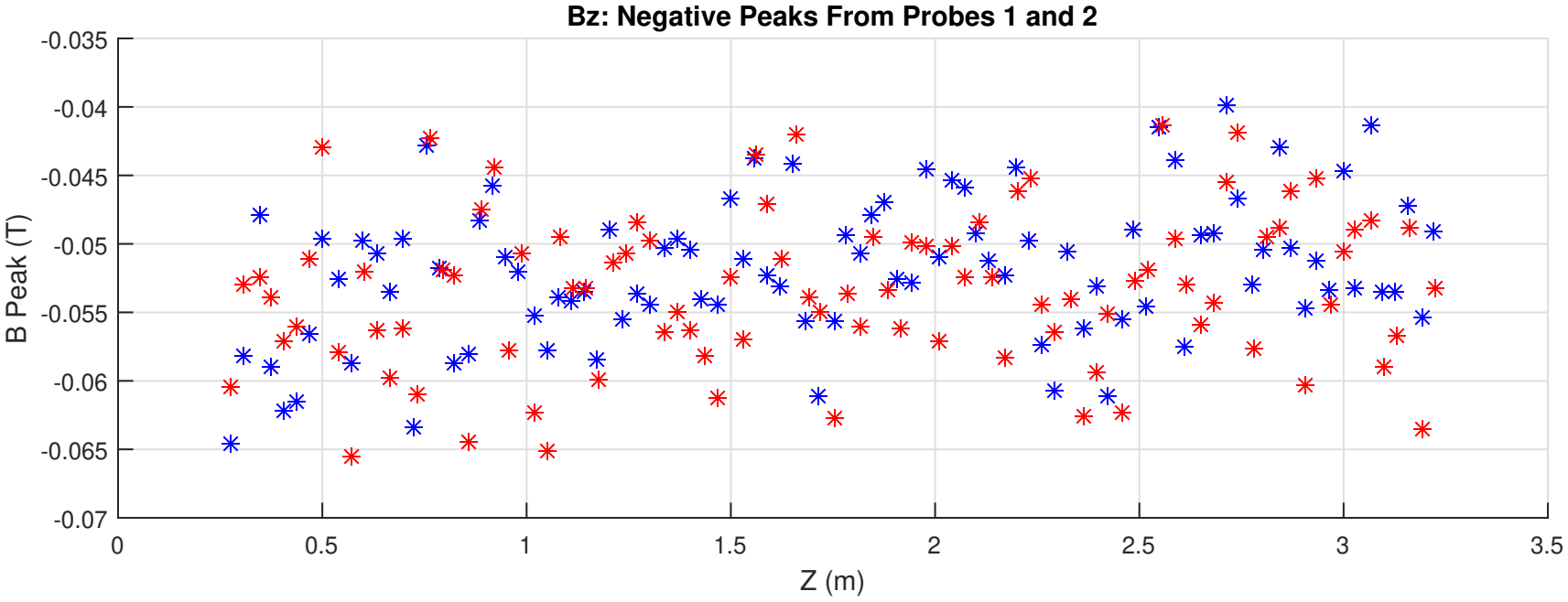

Bx: Positive Peaks From Probes 1 and 2
Probe 1
Probe 2
B Peak (T)
Z (m)
0.24
0.22
0.2
0.18
0.16
0.14
0
0.5
1
1.5
2
2.5
3
3.5


Bx: Negative Peaks From Probes 1 and 2
B Peak (T)
Z (m)
-0.14
-0.16
-0.18
-0.2
-0.22
-0.24
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
0.175
0.17
0.165
0.16
0.155
0.15
0.145
0.14
0.135
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)
-0.13
-0.14
-0.15
-0.16
-0.17
-0.18
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)
0.07
0.065
0.06
0.055
0.05
0.045
0.04
0.035
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)
-0.035
-0.04
-0.045
-0.05
-0.055
-0.06
-0.065
-0.07
0
0.5
1
1.5
2
2.5
3
3.5