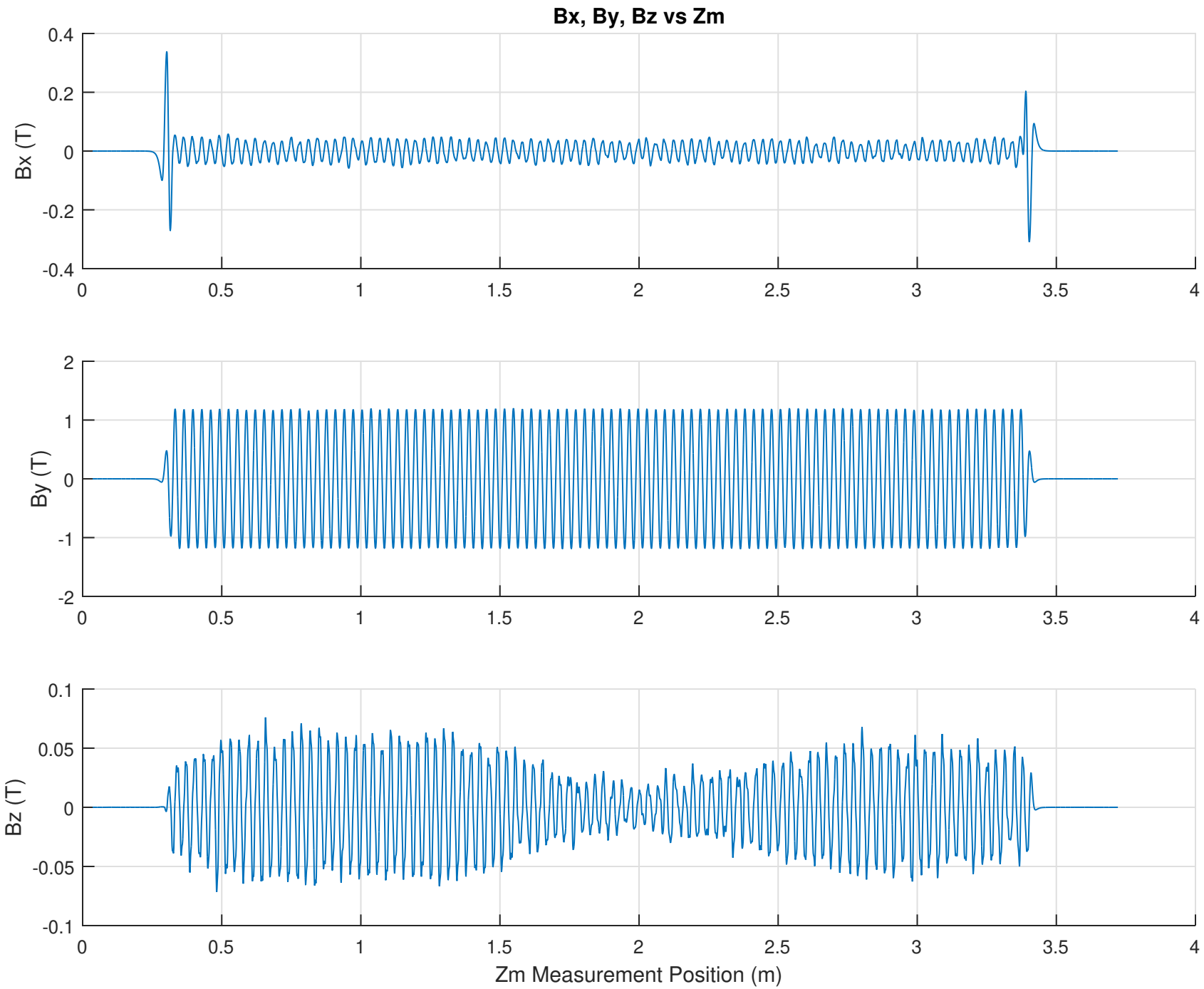
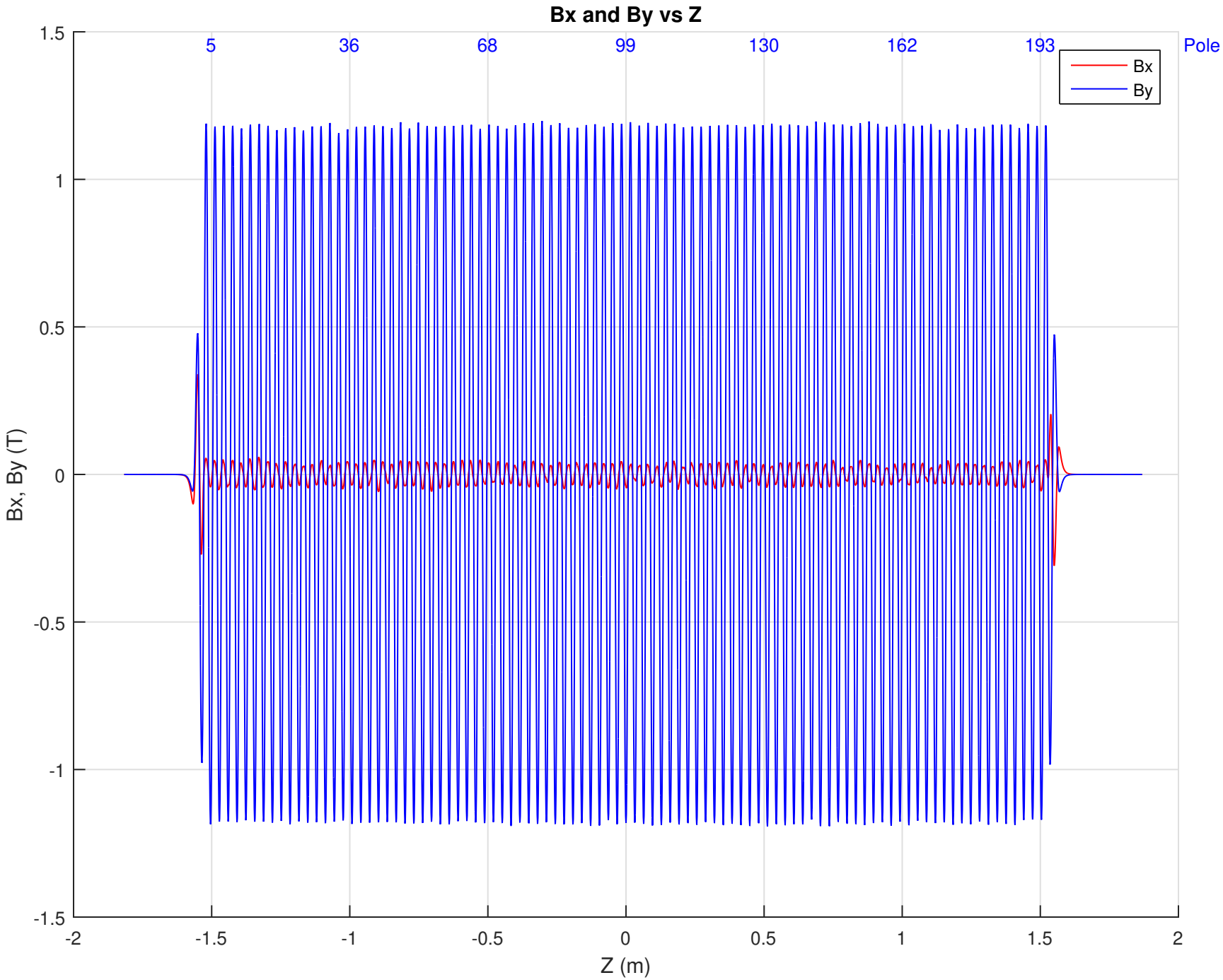
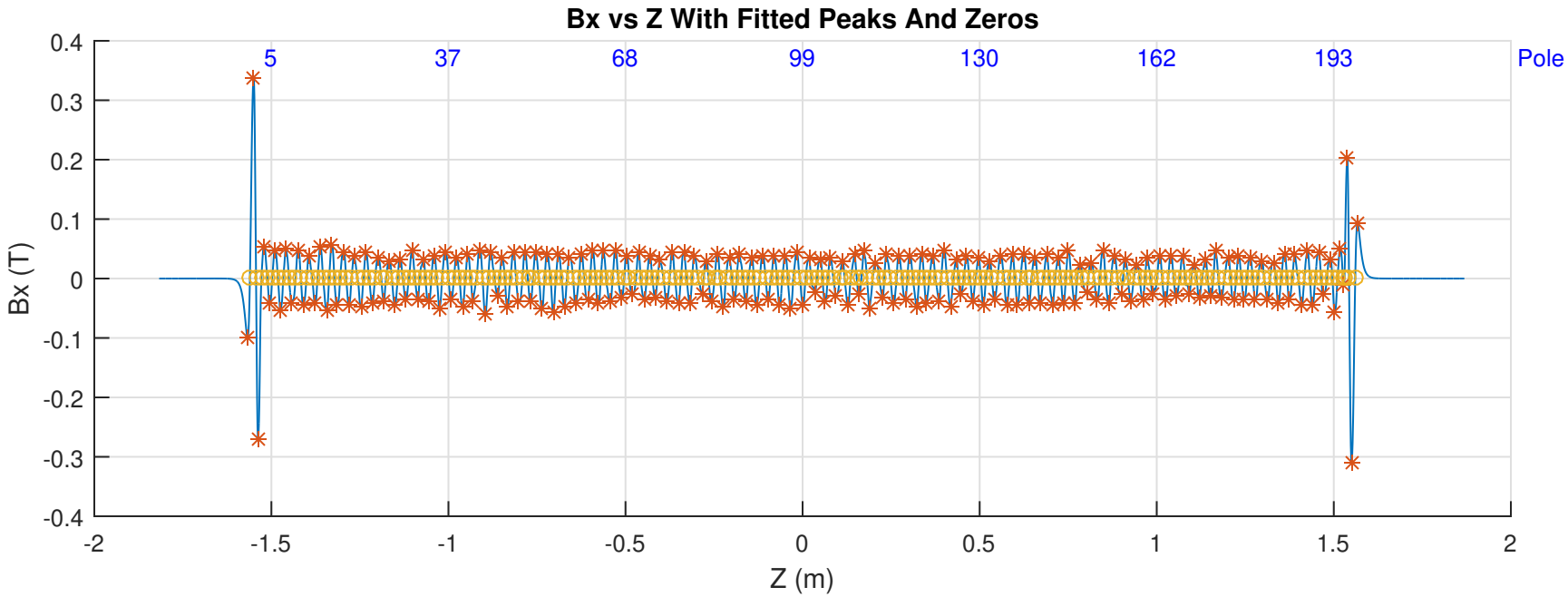
SLAC Magnetic Measurements

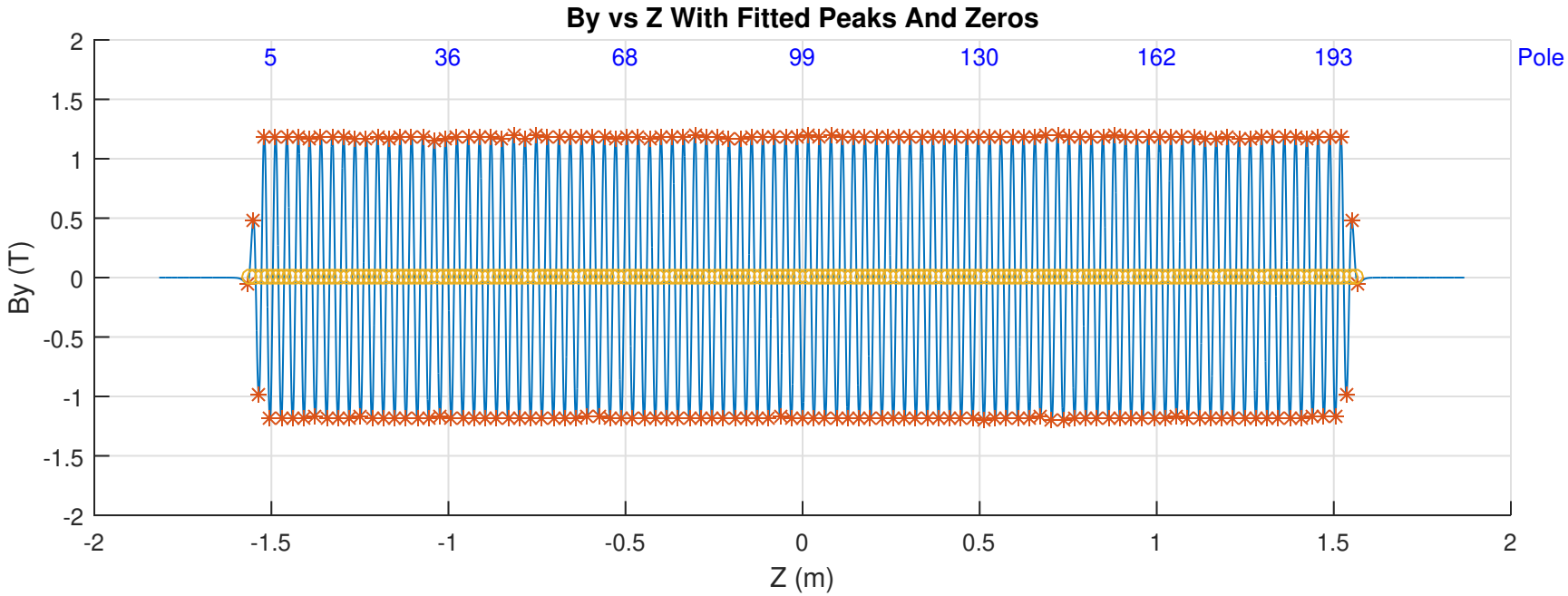
EPU Analysis

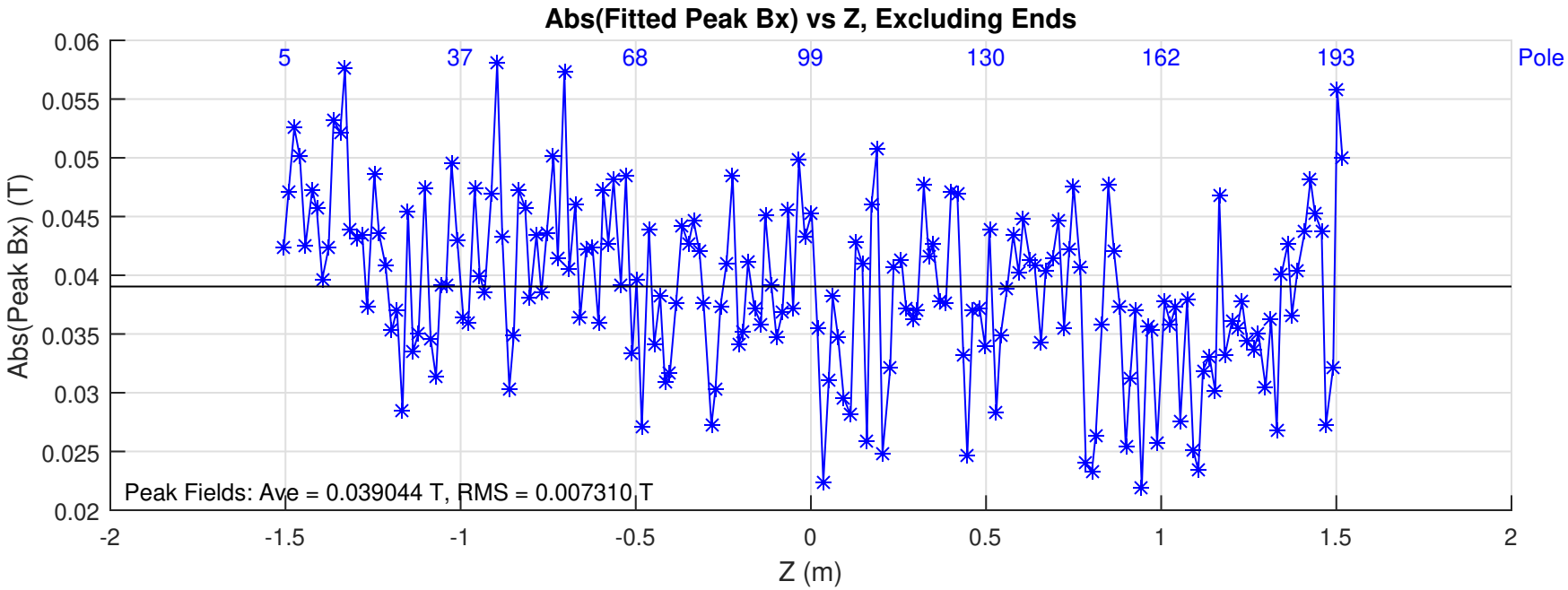
Parameters:
INPUT-FILE-DIR =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\New Measurements\Run 151 LPHMF Probe Rotated 90 De
INPUT-FILE-NAME =hall2-anal-probe2-field.dat
INPUT-FILE-TYPE =ZBXYZH
CORR-REQUIRED =0
GAMMA =26671.59
NOM-LAMBDA-U =0
NOM-K-VALUE =0
NOM-LAMBDA-R =0
NUM-POLES =196
NUM-END-POLES =4
CELL-LENGTH =3.656

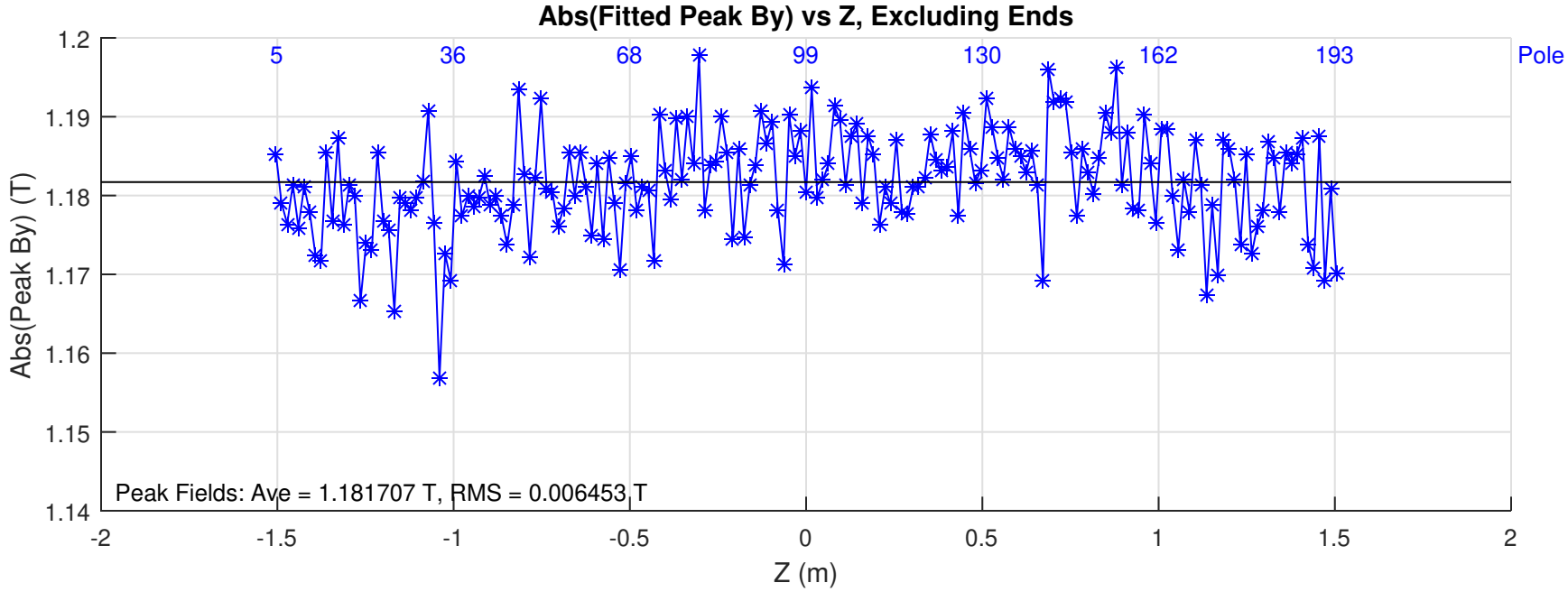

Bx, By, Bz vs Zm
Bx (T)
0.4
0.2
0
-0.2
-0.4
By (T)
2
1
0
-1
-2
Bz (T)
0.1
0.05
0
-0.05
-0.1
0
0.5
1
1.5
2
2.5
3
3.5
4
Zm Measurement Position (m)

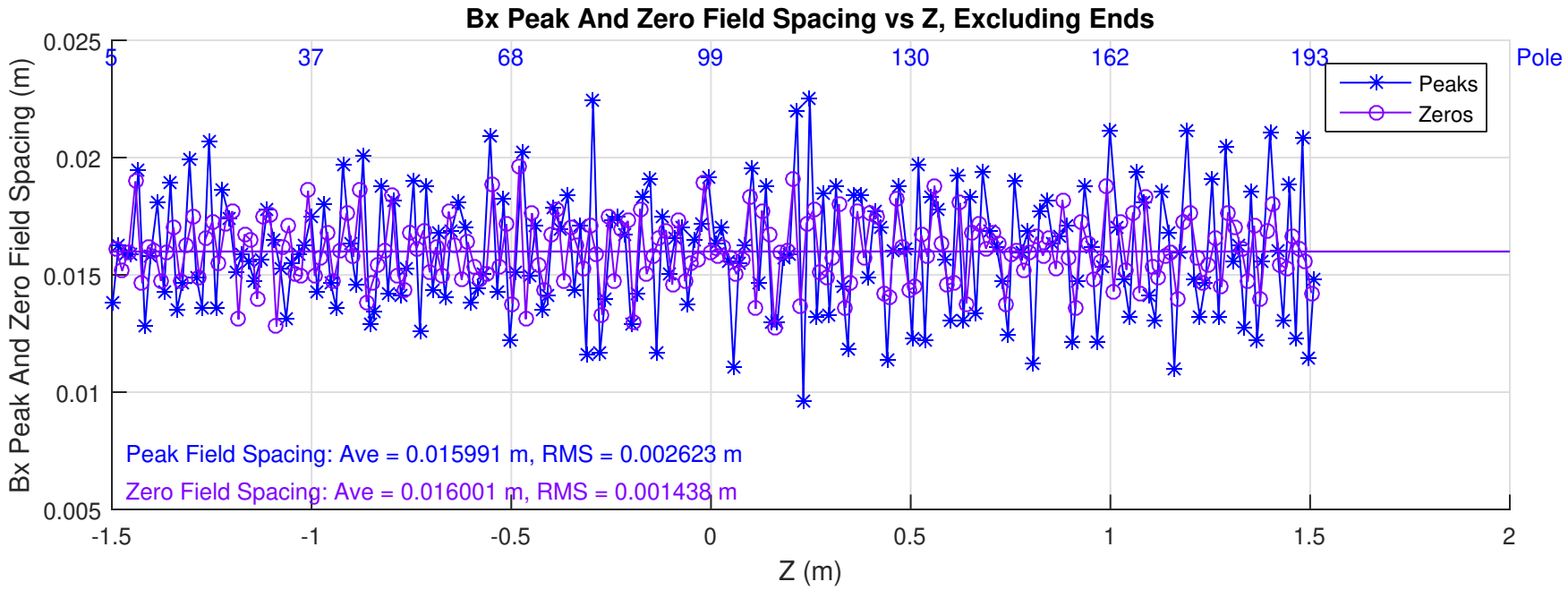

Bx and By vs Z
5
36
68
99
130
162
193
Pole
Bx
By
1.5
1
0.5
0
-0.5
-1
-1.5
Bx, By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

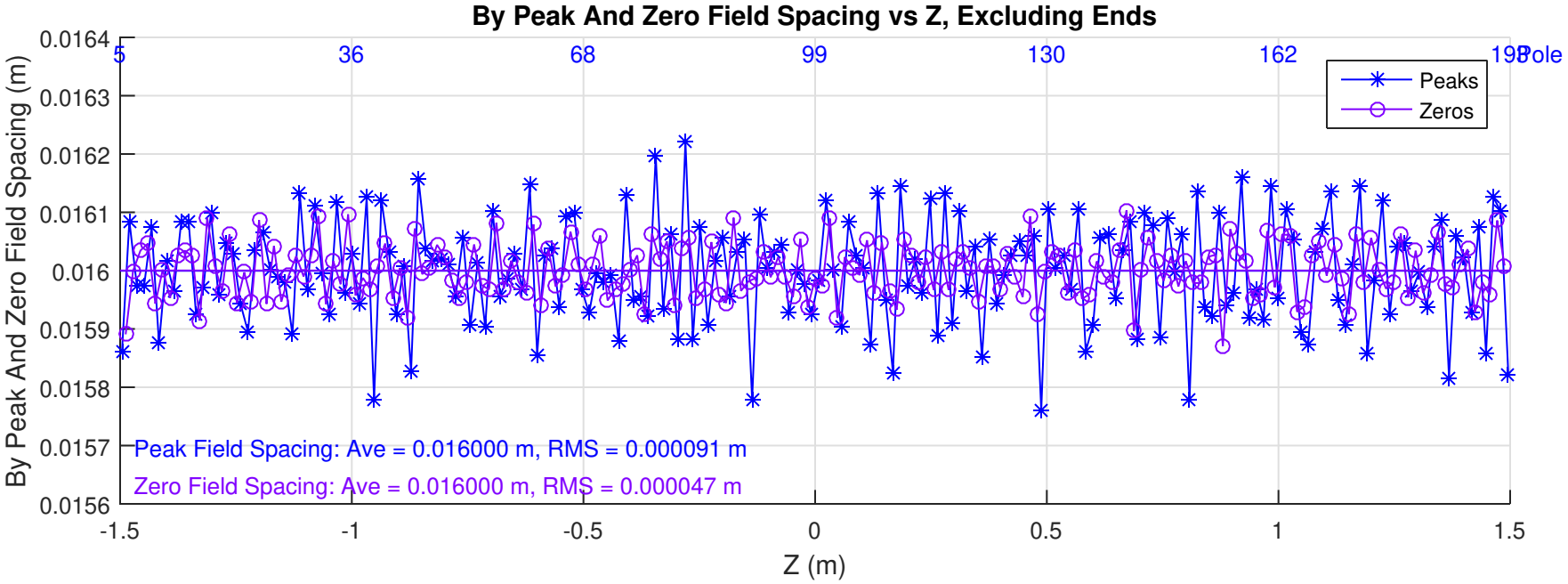

Bx vs Z With Fitted Peaks And Zeros
5
37
68
99
130
162
193
Pole
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
Bx (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

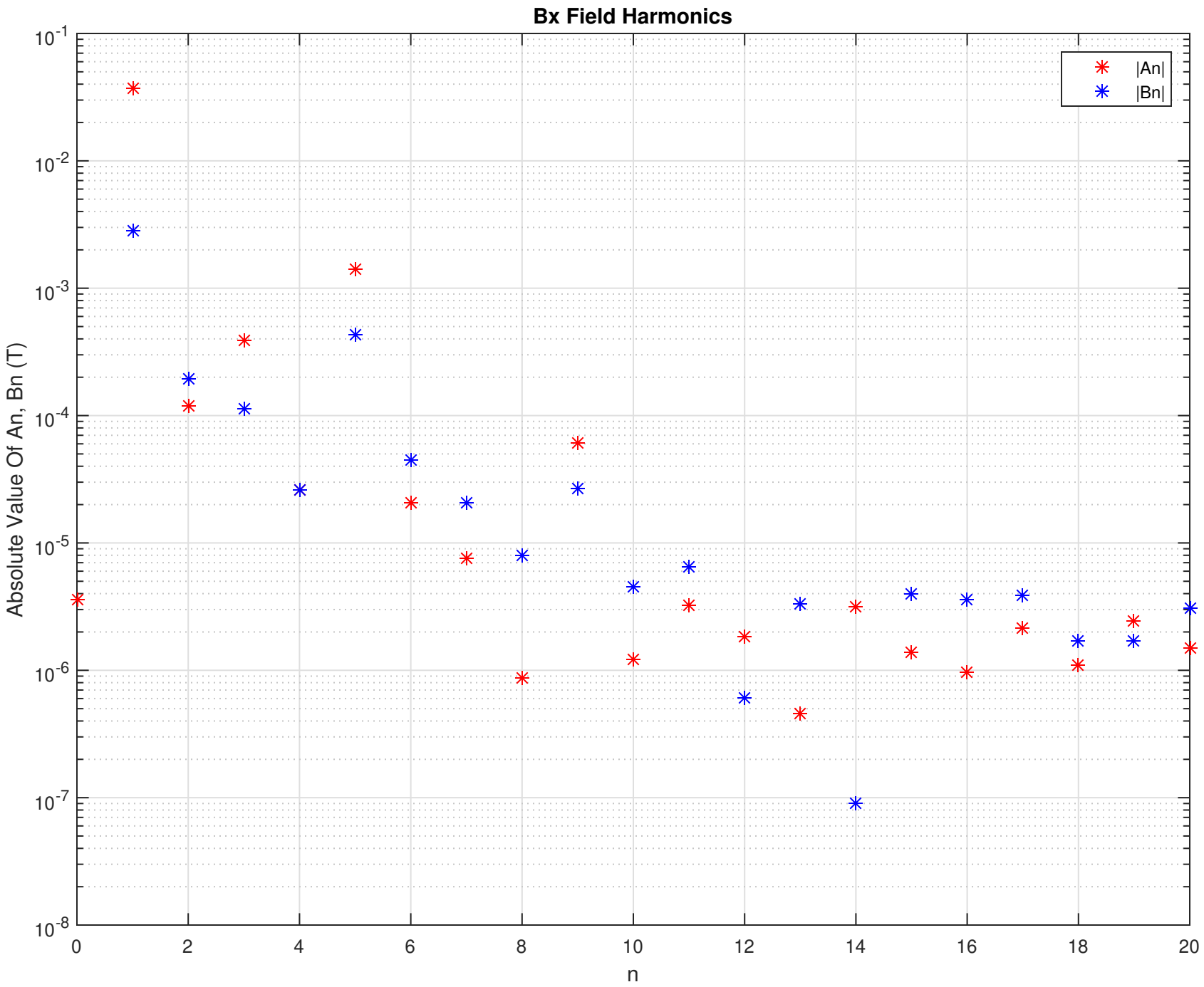

By vs Z With Fitted Peaks And Zeros
5
36
68
99
130
162
193
Pole
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

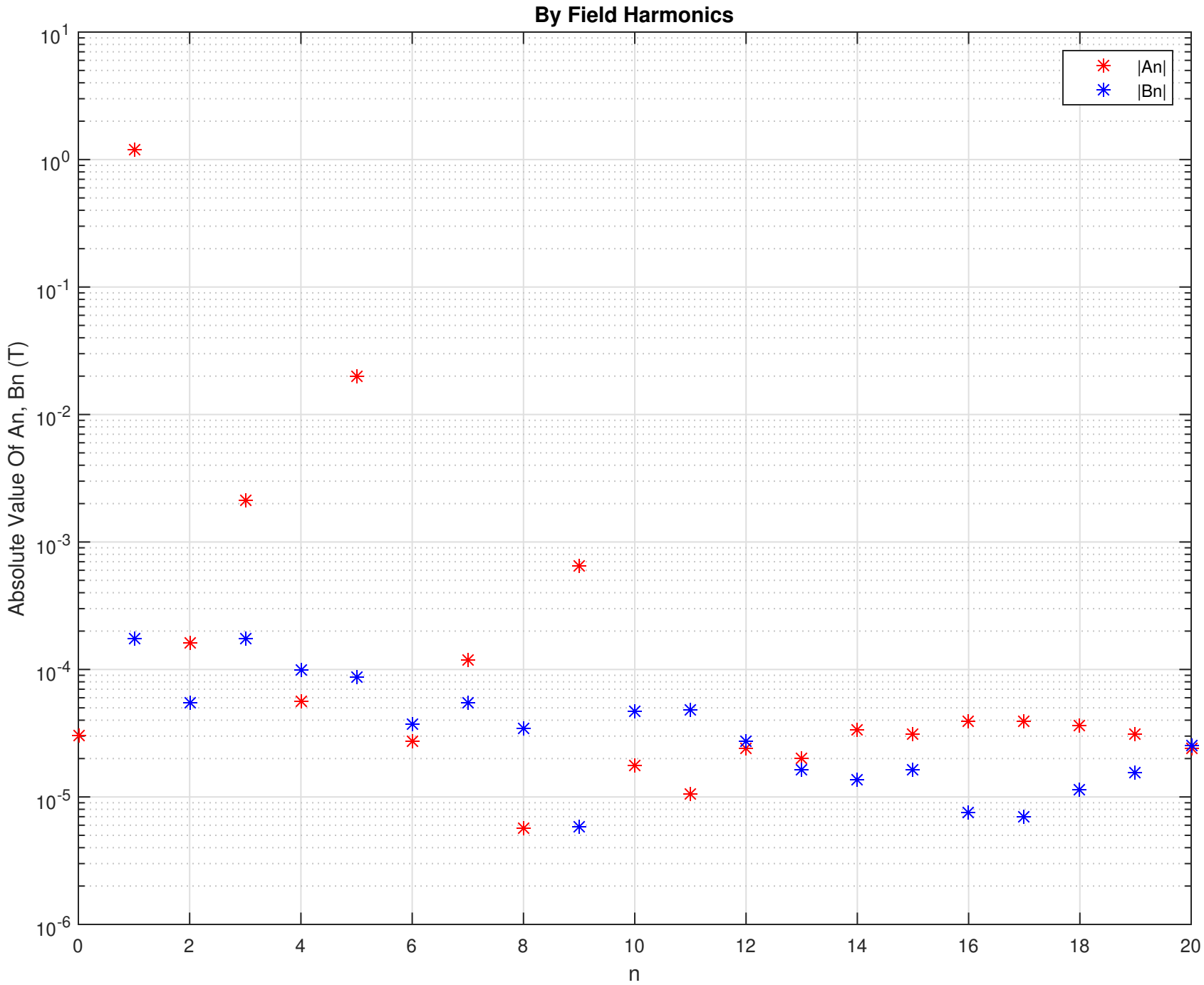

Abs(Fitted Peak Bx) vs Z, Excluding Ends
5
37
68
99
130
162
193
Pole
0.06
0.055
0.05
0.045
0.04
0.035
0.03
0.025
0.02
Abs(Peak Bx) (T)
Peak Fields: Ave = 0.039044 T, RMS = 0.007310 T
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

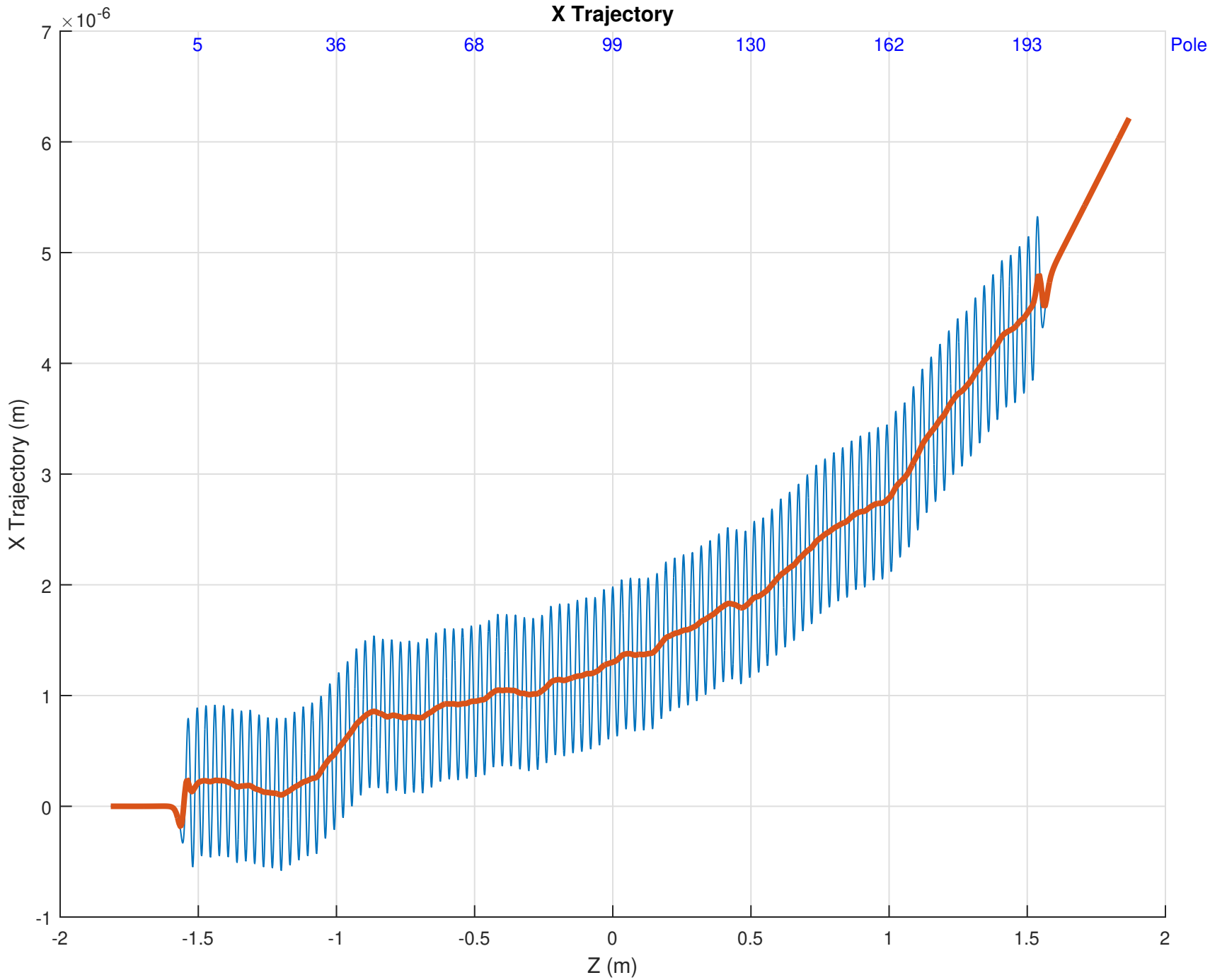

Abs(Fitted Peak By) vs Z, Excluding Ends
5
36
68
99
130
162
193
Pole
1.2
1.19
1.18
1.17
1.16
1.15
1.14
Abs(Peak By) (T)
Peak Fields: Ave = 1.181707 T, RMS = 0.006453 T
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

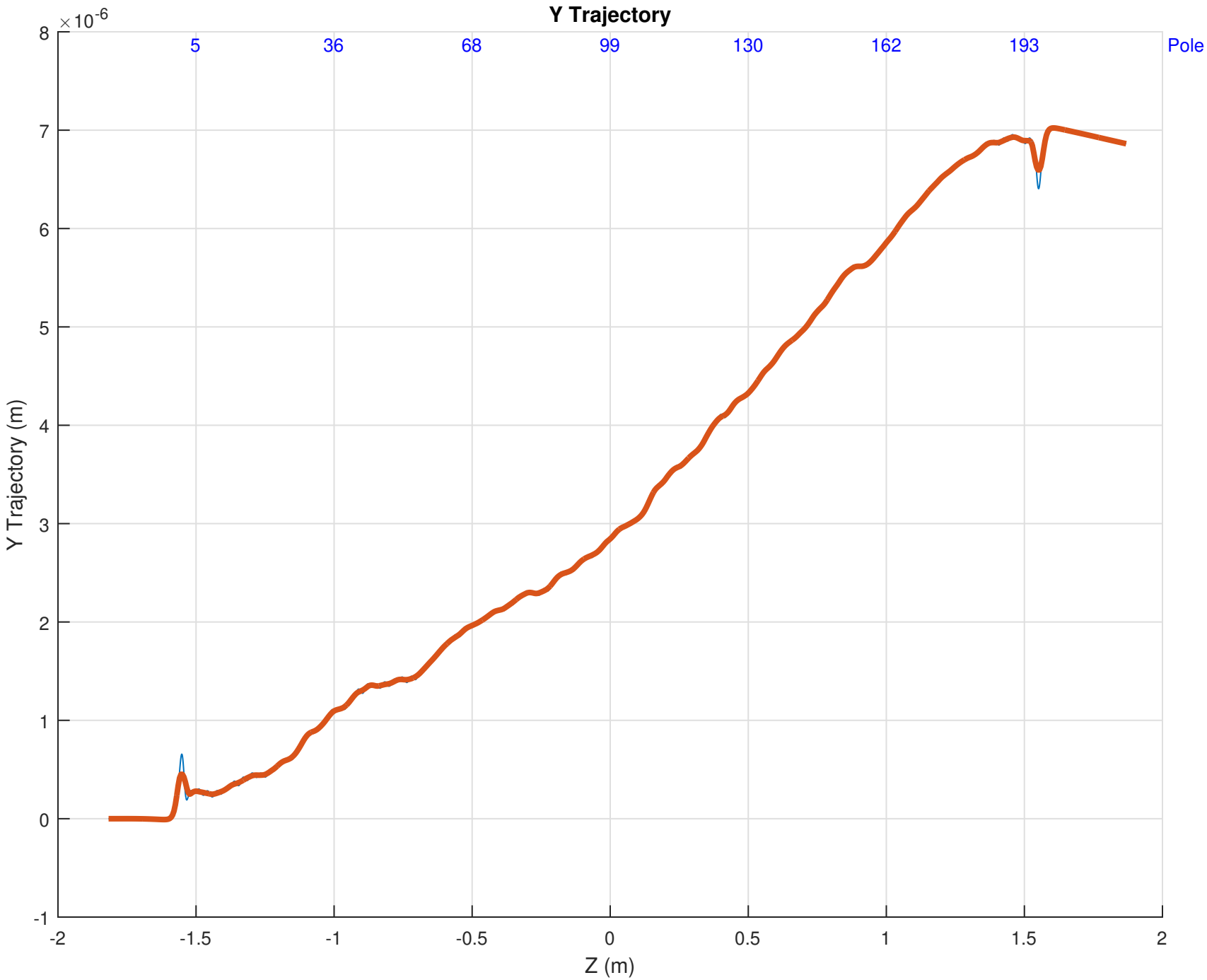

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.015991 m, RMS = 0.002623 m
Zero Field Spacing: Ave = 0.016001 m, RMS = 0.001438 m

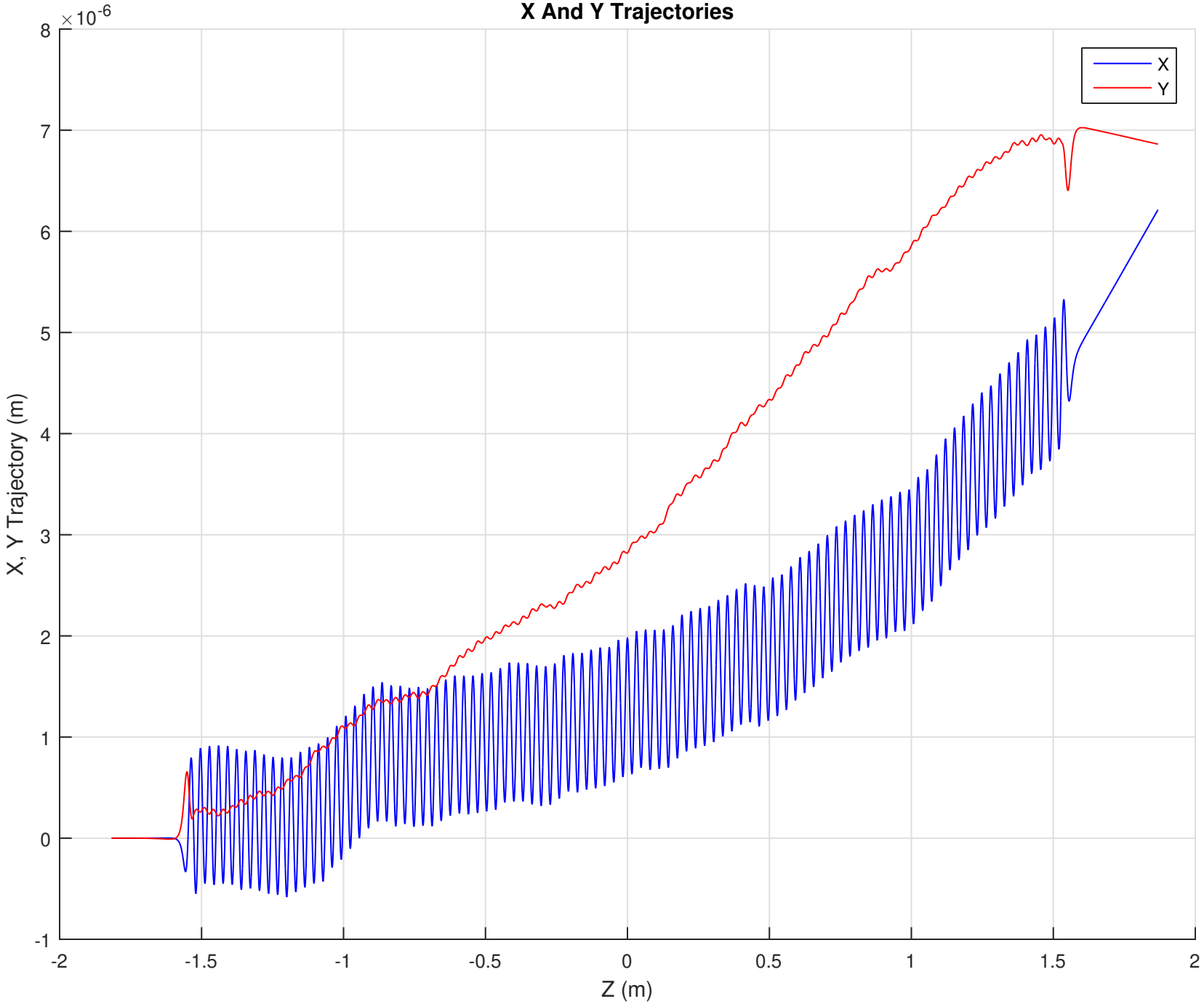

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.016000 m, RMS = 0.000091 m
Zero Field Spacing: Ave = 0.016000 m, RMS = 0.000047 m

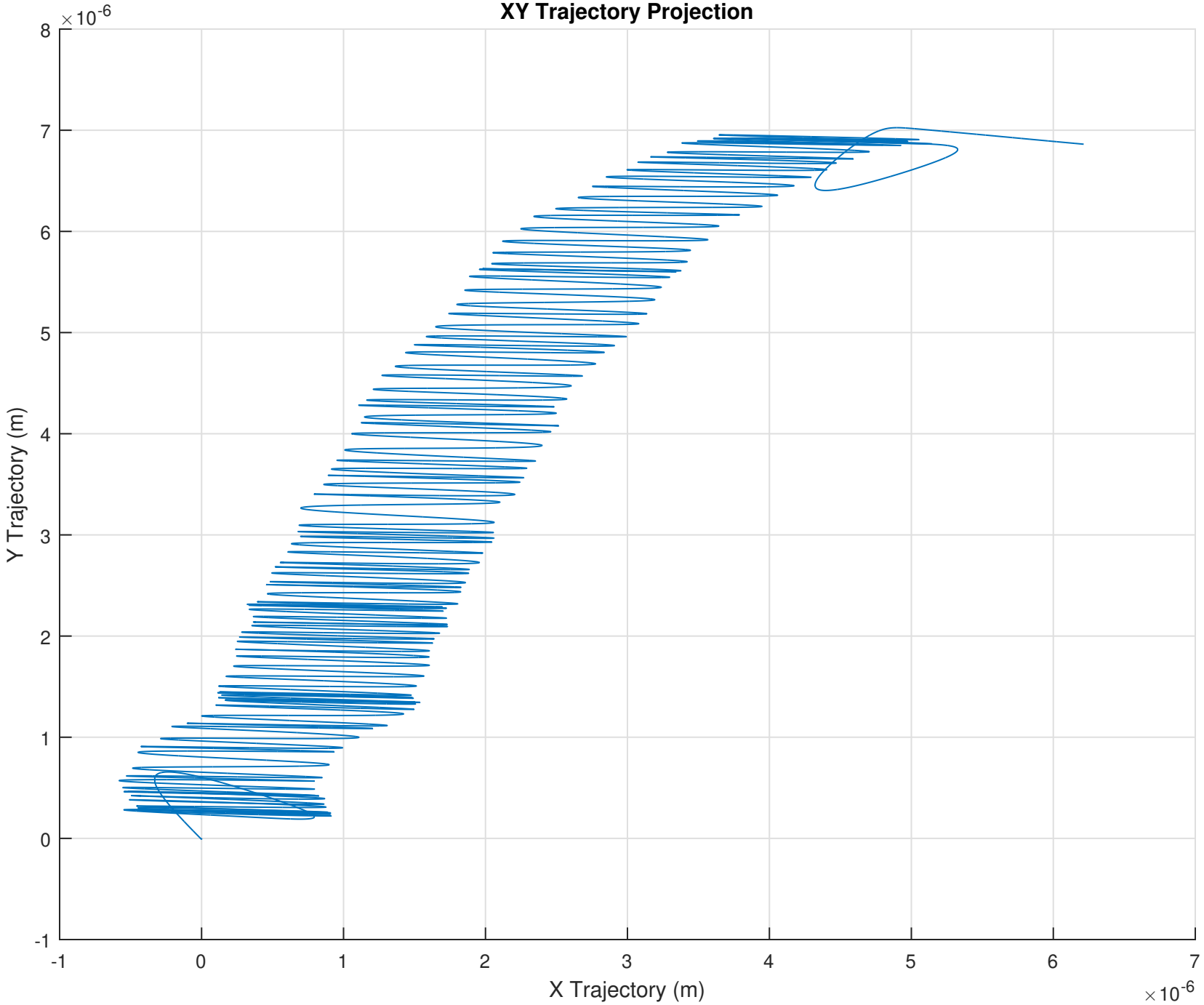

Bx Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
0
2
4
6
8
10
12
14
16
18
20

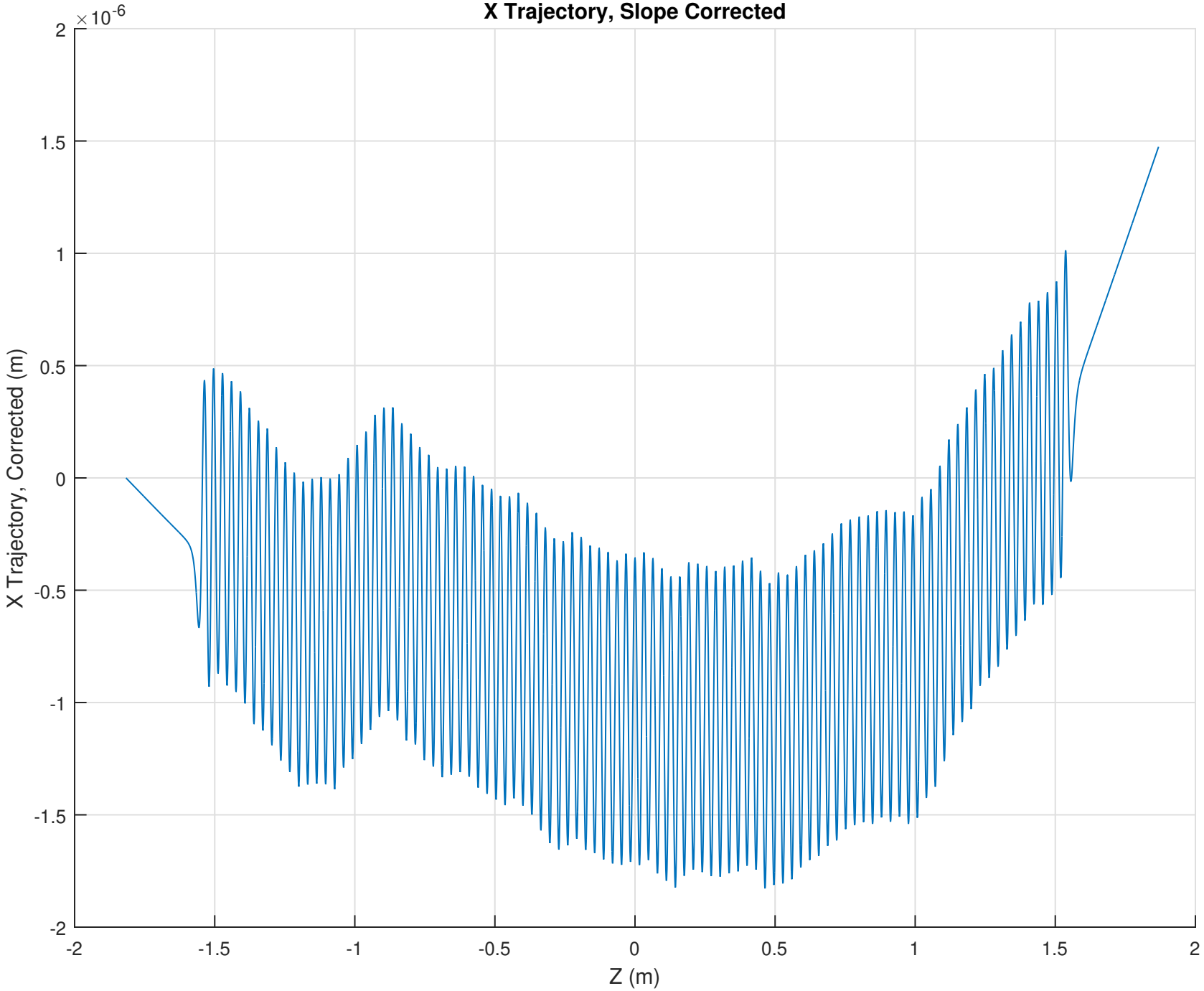

By Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
0
2
4
6
8
10
12
14
16
18
20

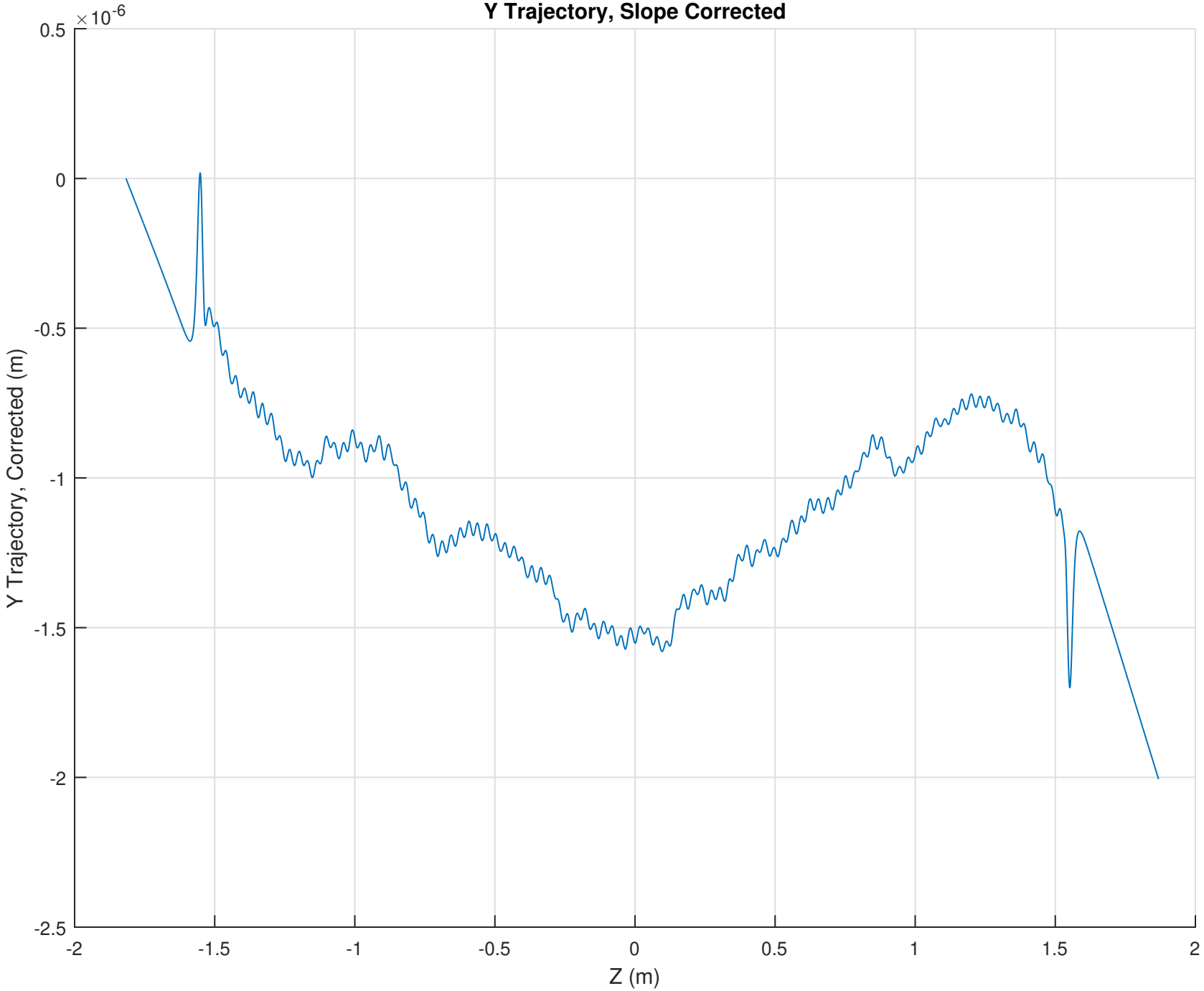

X Trajectory
×10-6
7
6
5
4
3
2
1
0
-1
5
36
68
99
130
162
193
Pole
X Trajectory (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

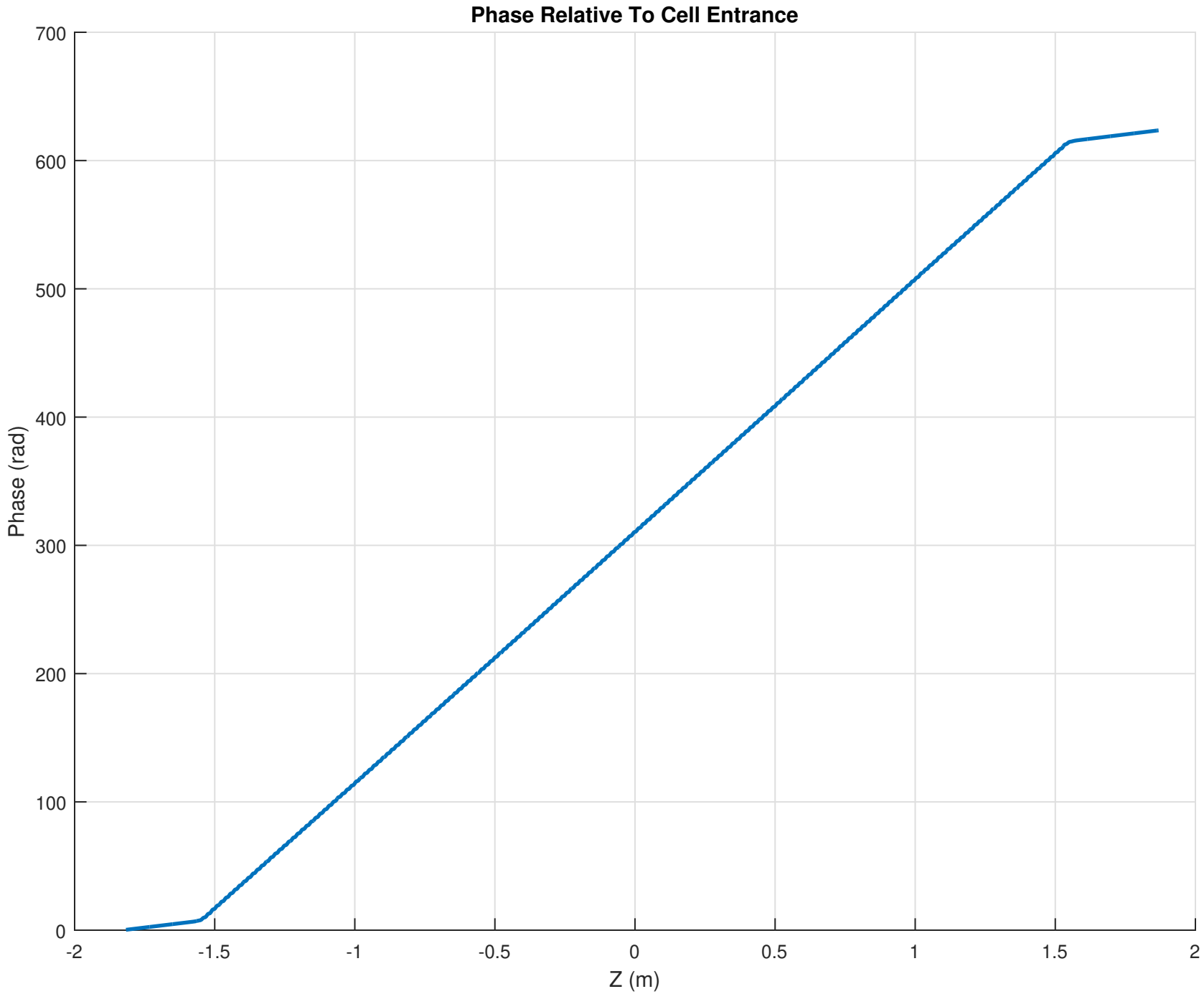

Y Trajectory
×10-6
8
7
6
5
4
3
2
1
0
-1
5
36
68
99
130
162
193
Pole
Y Trajectory (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

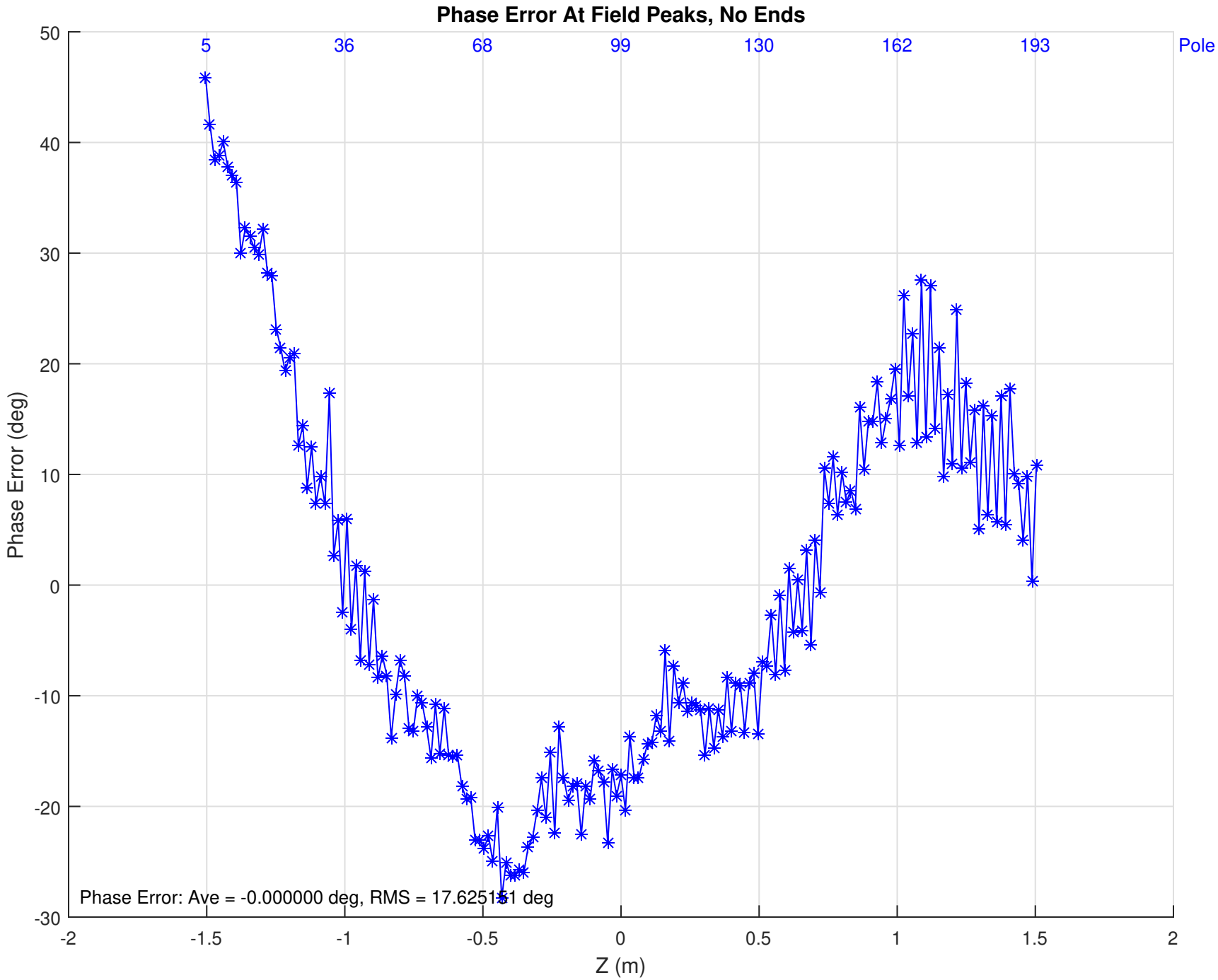

X And Y Trajectories
×10-6
8
7
6
5
4
3
2
1
0
-1
X, Y Trajectory (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)
X
Y

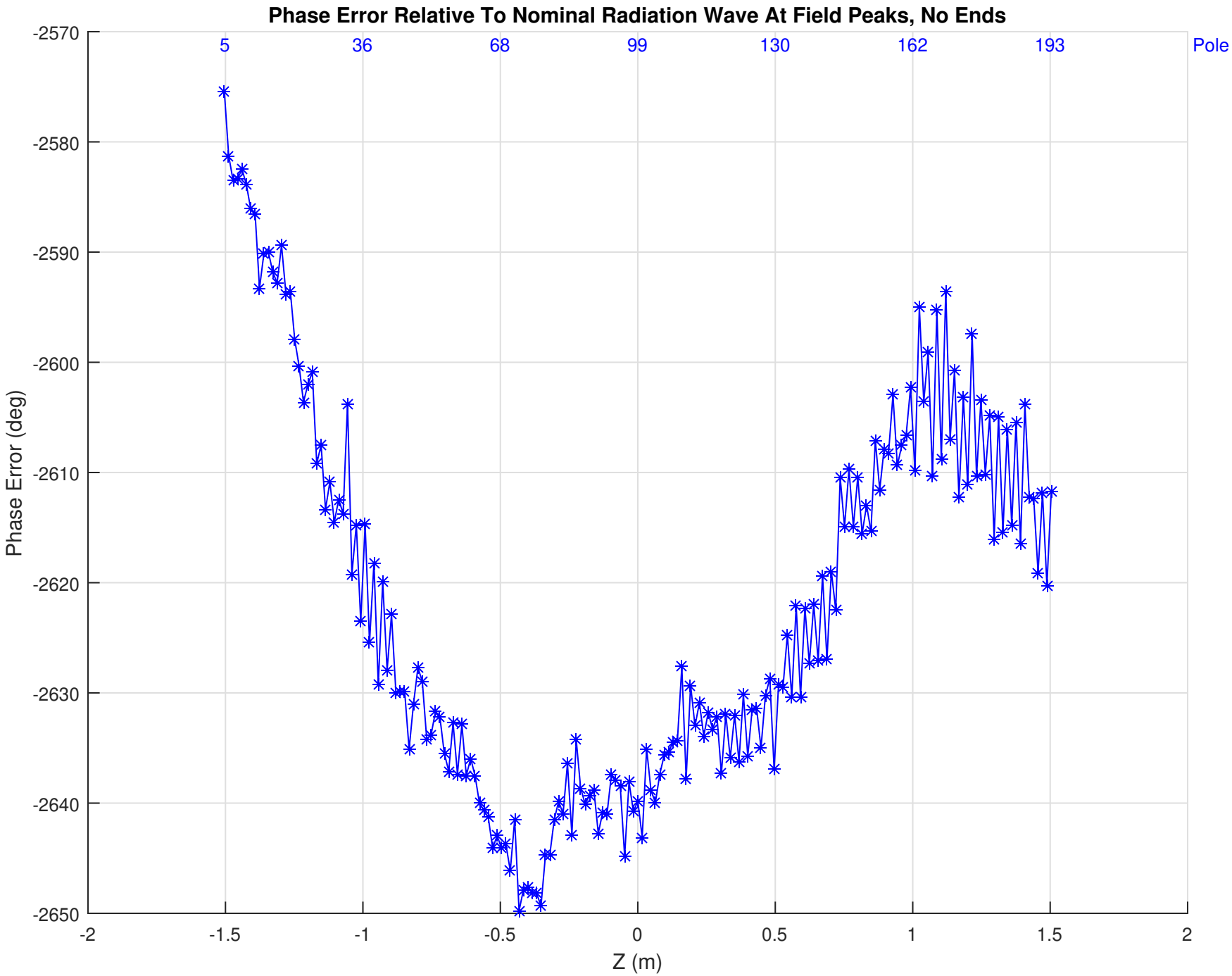

XY Trajectory Projection
×10-6
8
7
6
5
4
3
2
1
0
-1
Y Trajectory (m)
-1
0
1
2
3
4
5
6
7
X Trajectory (m)
×10-6

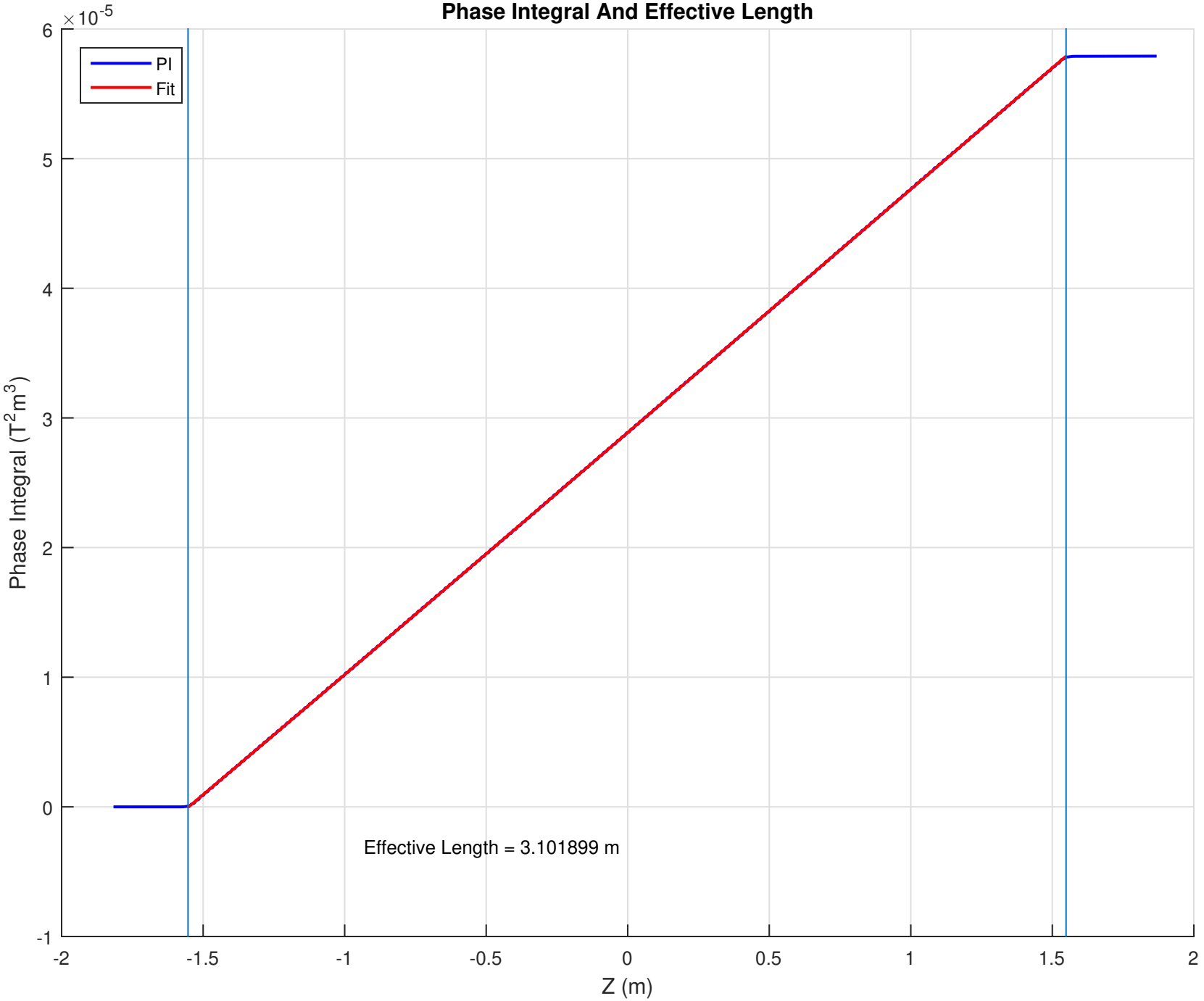

X Trajectory, Slope Corrected
×10-6
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
X Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

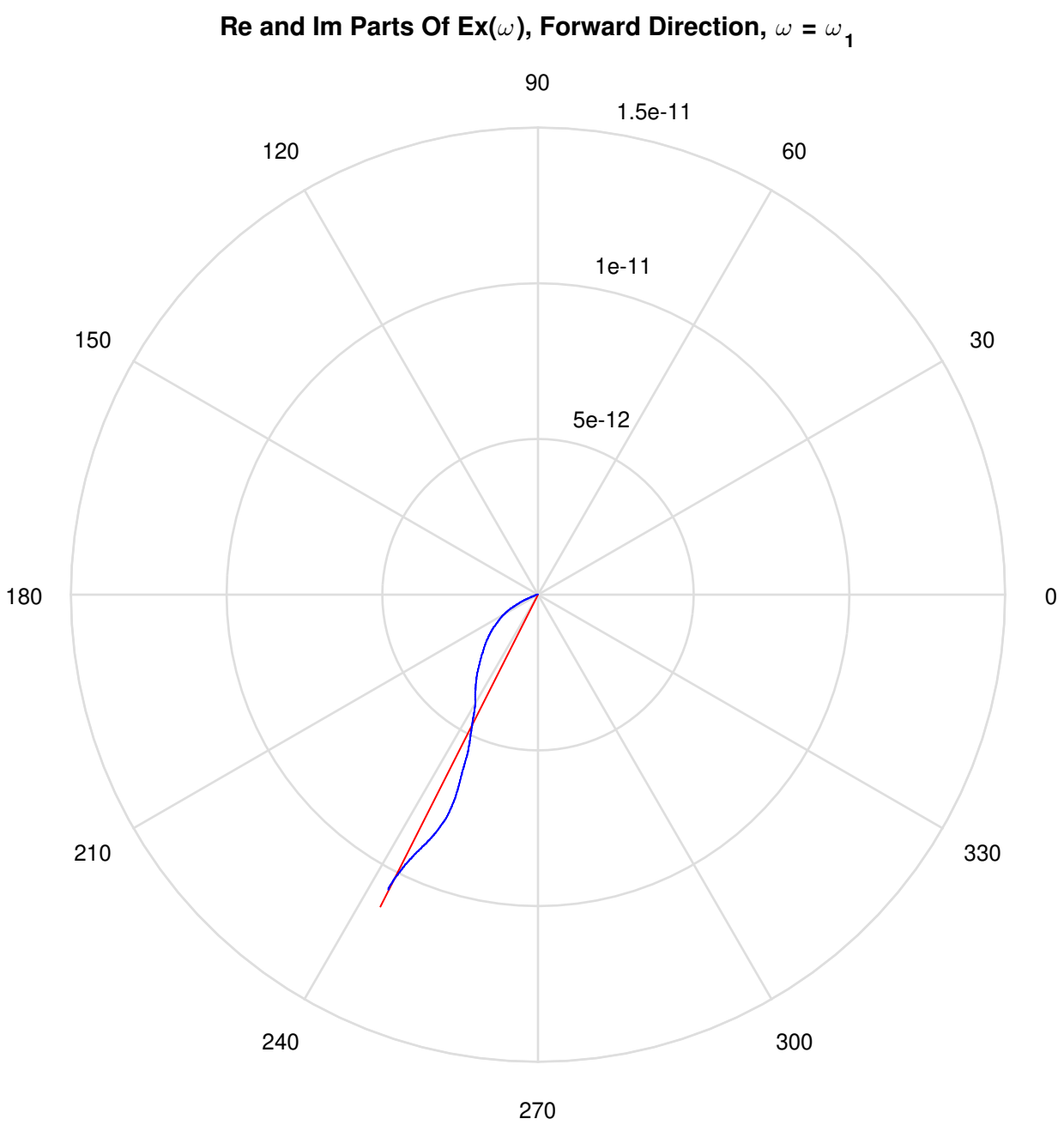

Y Trajectory, Slope Corrected
×10-6
0.5
0
-0.5
-1
-1.5
-2
-2.5
Y Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

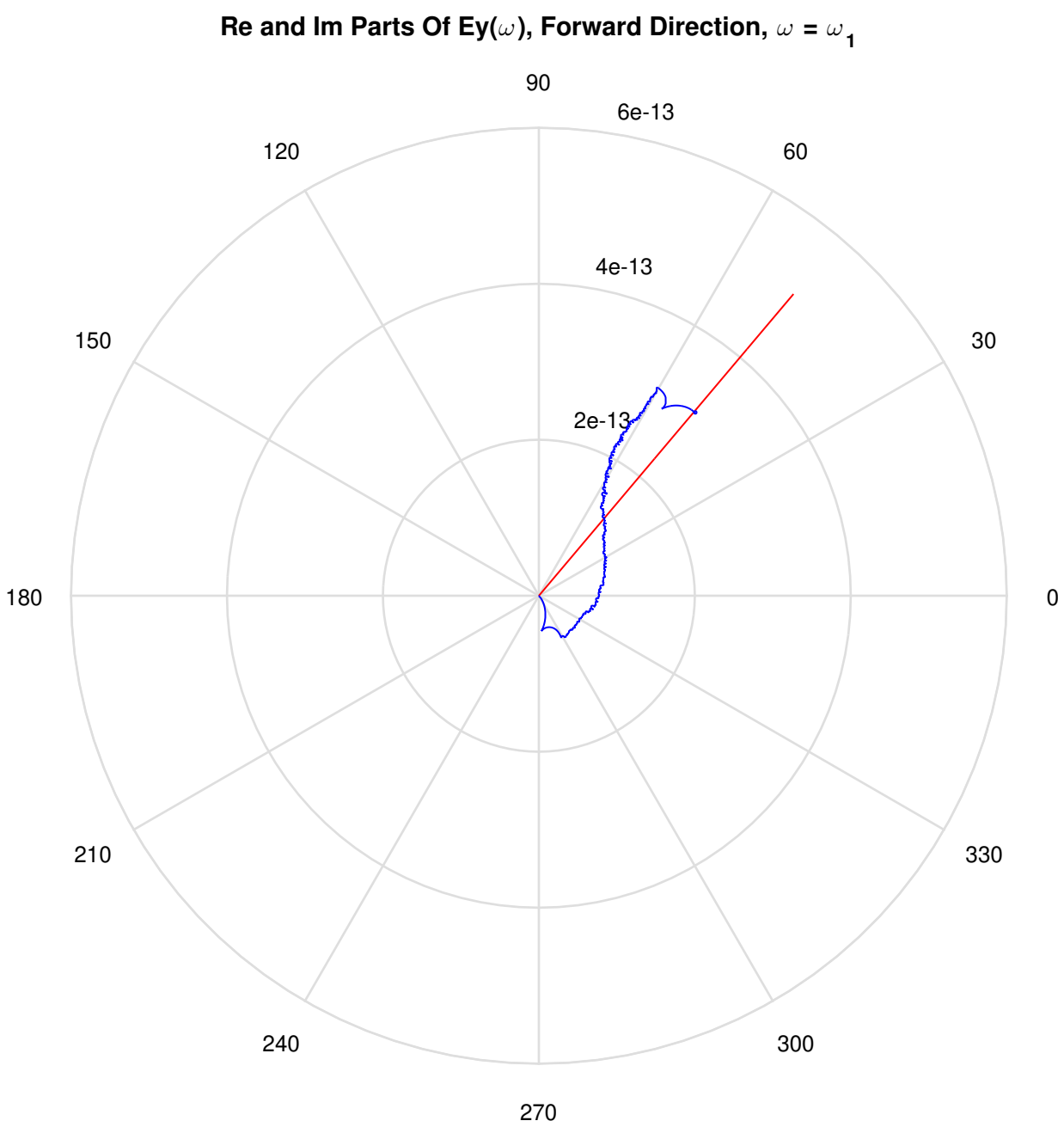

Phase Relative To Cell Entrance
700
600
500
400
300
200
100
0
Phase (rad)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

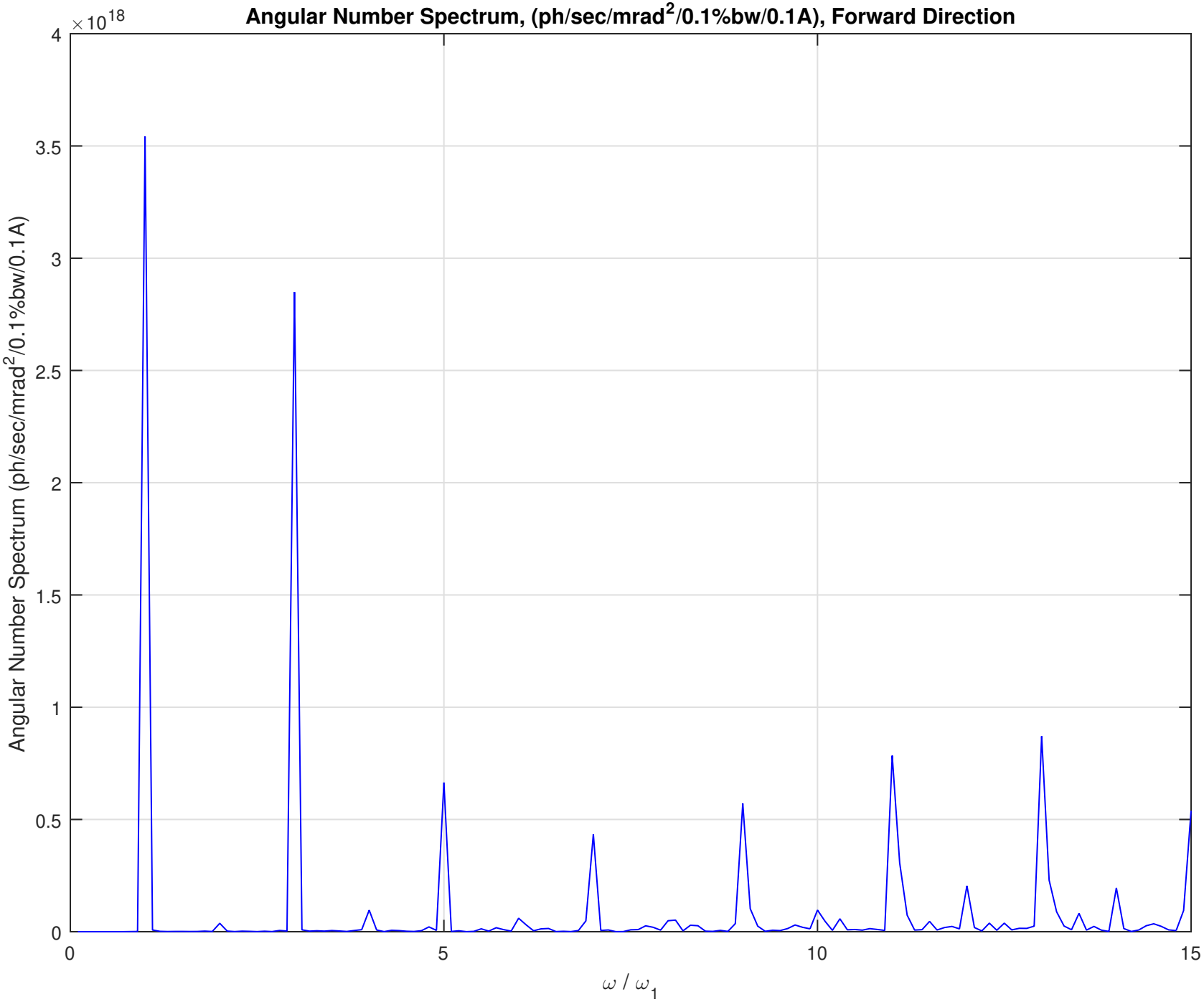

Phase Error At Field Peaks, No Ends
5
36
68
99
130
162
193
Pole
50
40
30
20
10
0
-10
-20
-30
Phase Error (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)
Phase Error: Ave = -0.000000 deg, RMS = 17.625151 deg

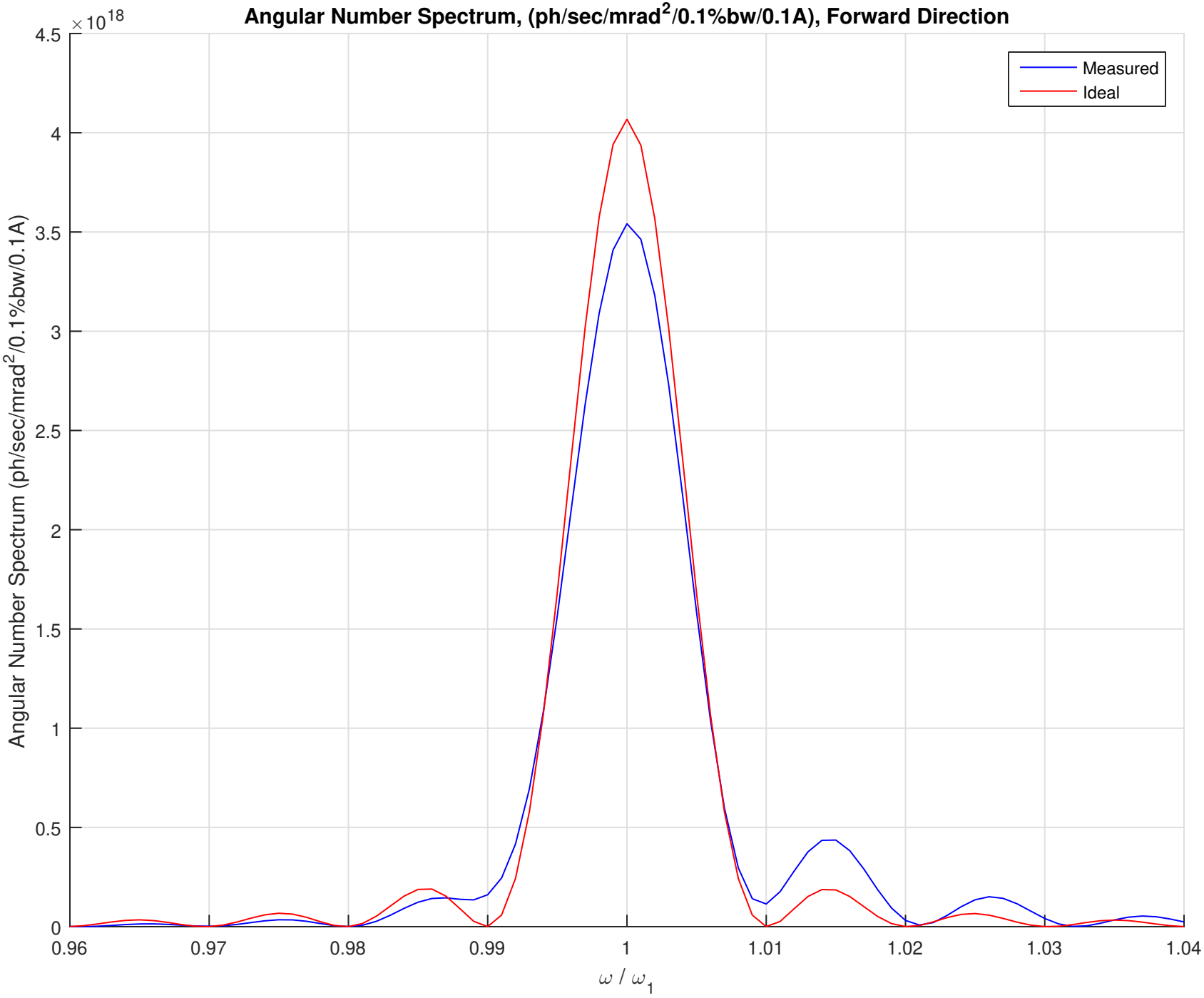

Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
5
36
68
99
130
162
193
Pole
-2570
-2580
-2590
-2600
-2610
-2620
-2630
-2640
-2650
Phase Error (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

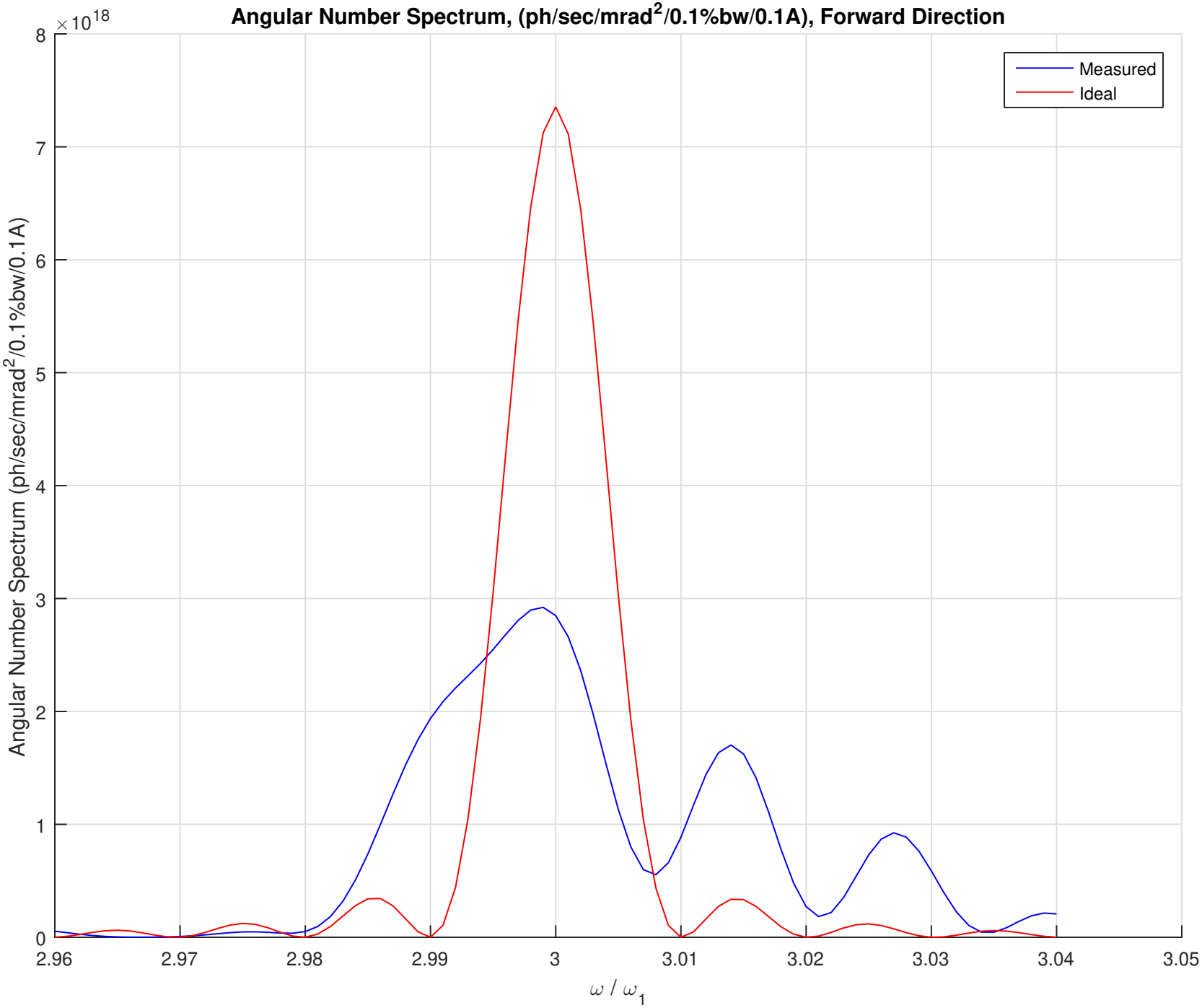

Phase Integral And Effective Length
×10^-5
6
5
4
3
2
1
0
-1
PI
Fit
Phase Integral (T^2m^3)
Effective Length = 3.101899 m
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

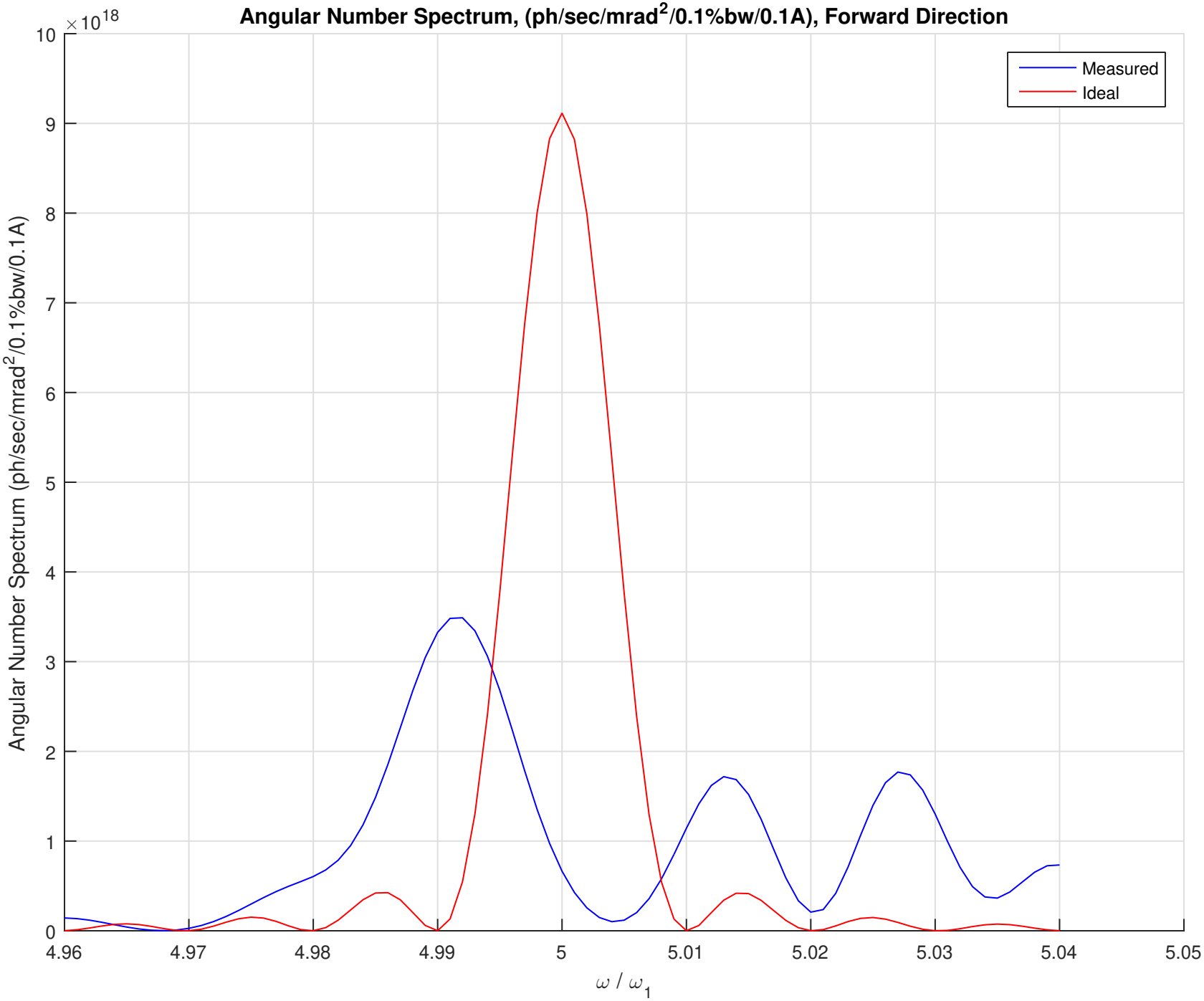

Re and Im Parts Of Ex(ω), Forward Direction, ω = ω1
90
1.5e-11
120
60
1e-11
150
30
5e-12
180
0
210
330
240
300
270


Re and Im Parts Of Ey(ω), Forward Direction, ω = ω1
90
6e-13
120
60
4e-13
150
30
2e-13
180
0
210
330
240
300
270


Angular Number Spectrum, (ph/sec/mrad^2/0.1%bw/0.1A), Forward Direction
$\times 10^{18}$
Angular Number Spectrum (ph/sec/mrad^2/0.1%bw/0.1A)
0
0.5
1
1.5
2
2.5
3
3.5
4
0
5
10
15
ω / ω_1


Angular Number Spectrum, (ph/sec/mrad^2/0.1%bw/0.1A), Forward Direction
$\times 10^{18}$
Measured
Ideal
Angular Number Spectrum (ph/sec/mrad^2/0.1%bw/0.1A)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0.96
0.97
0.98
0.99
1
1.01
1.02
1.03
1.04
ω / ω_1


Angular Number Spectrum, (ph/sec/mrad^2/0.1%bw/0.1A), Forward Direction
$\times 10^{18}$
Measured
Ideal
Angular Number Spectrum (ph/sec/mrad^2/0.1%bw/0.1A)
ω / ω_1
0
1
2
3
4
5
6
7
8
2.96
2.97
2.98
2.99
3
3.01
3.02
3.03
3.04
3.05


Angular Number Spectrum, (ph/sec/mrad^2/0.1%bw/0.1A), Forward Direction
$\times 10^{18}$
10
9
8
7
6
5
4
3
2
1
0
Angular Number Spectrum (ph/sec/mrad^2/0.1%bw/0.1A)
Measured
Ideal
4.96
4.97
4.98
4.99
5
5.01
5.02
5.03
5.04
5.05
ω / ω_1