SLAC Magnetic Measurements

EPU Analysis
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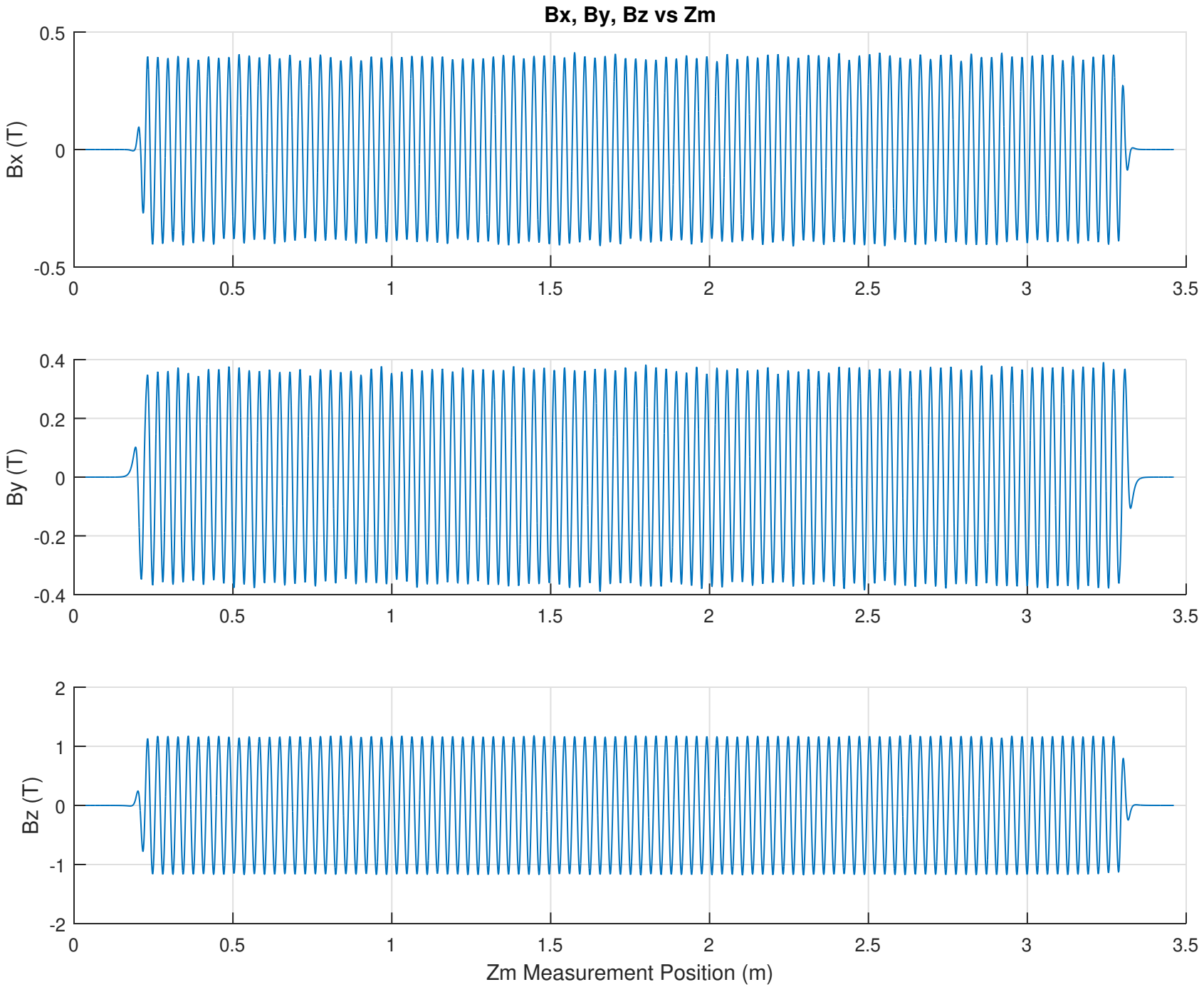
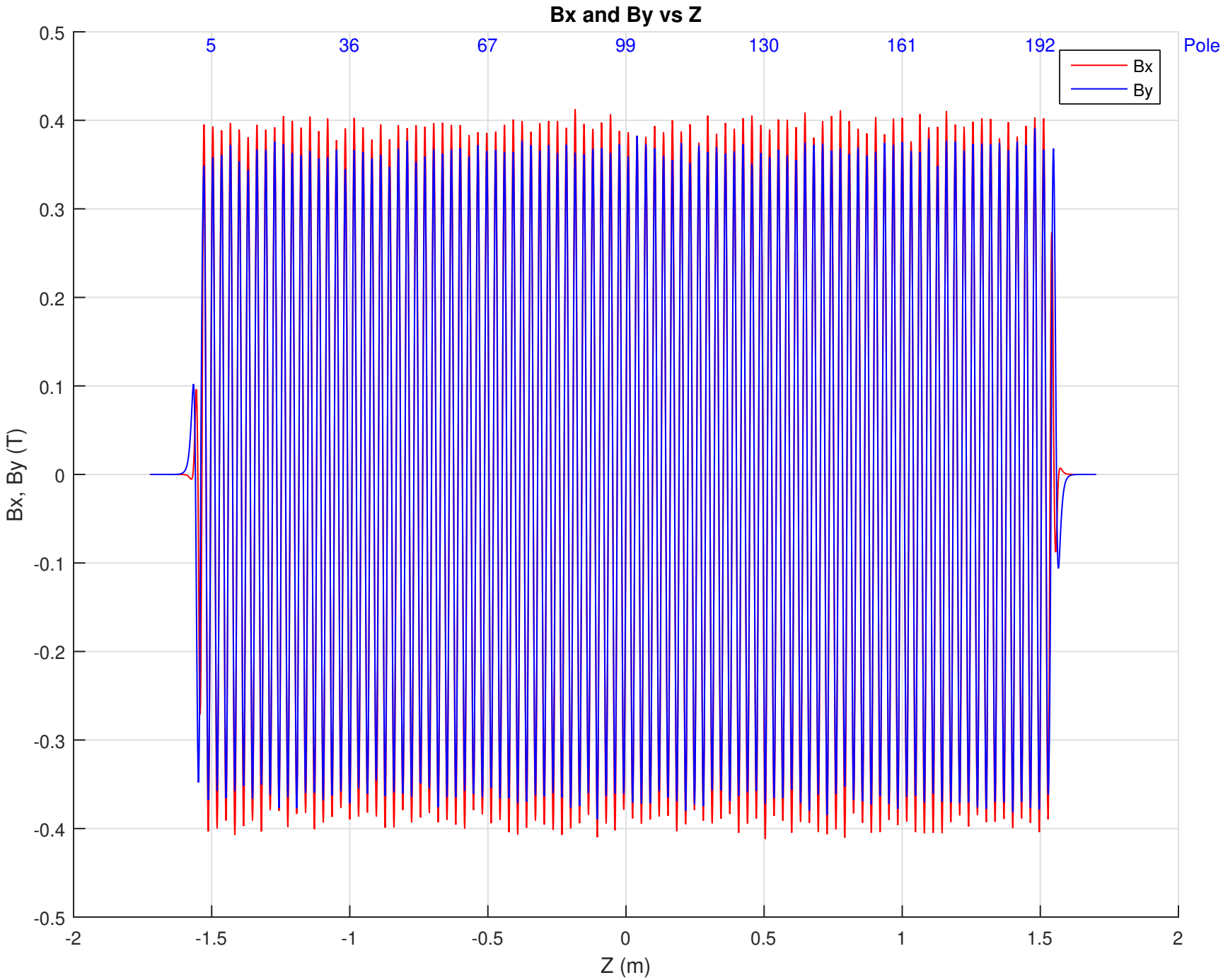
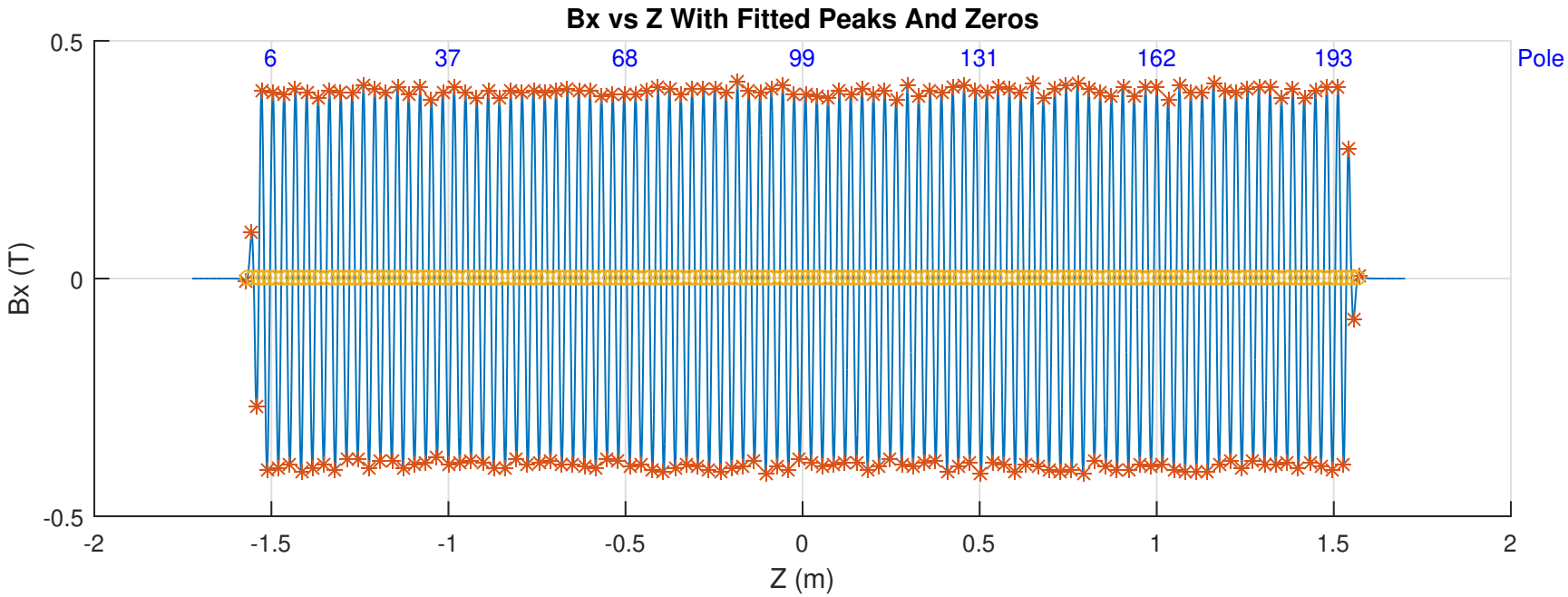
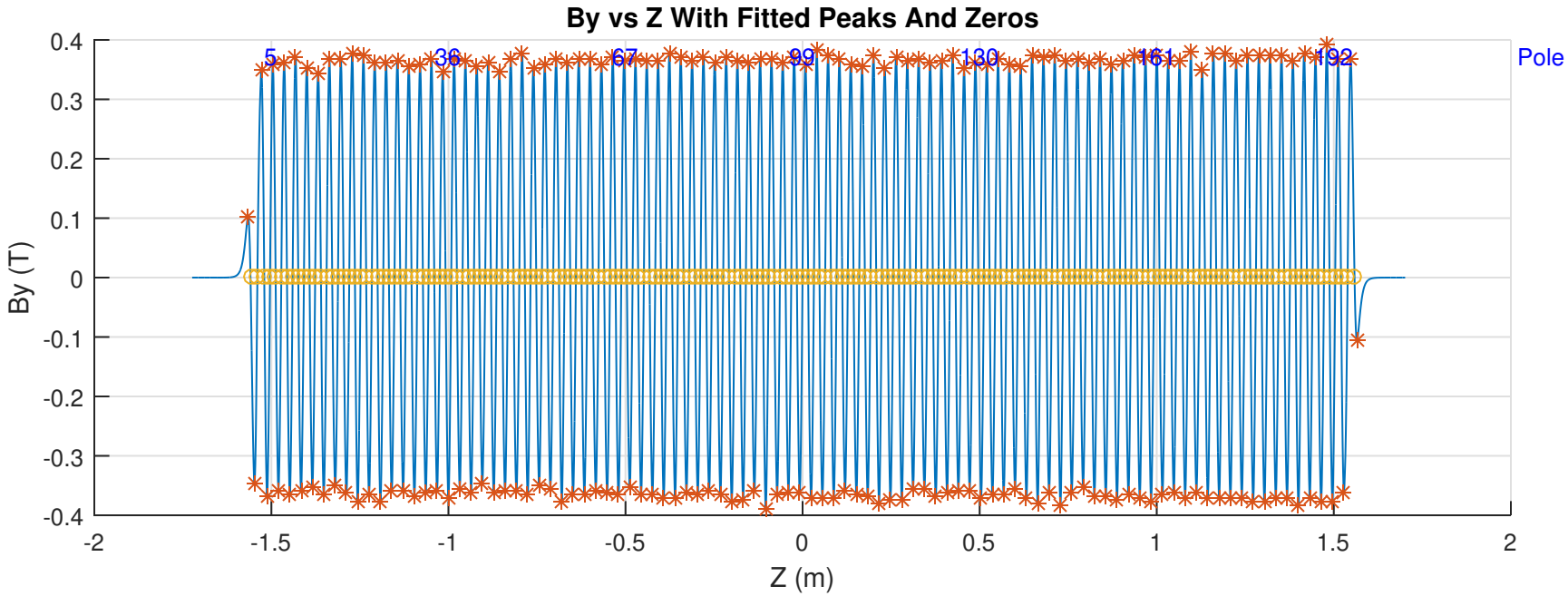
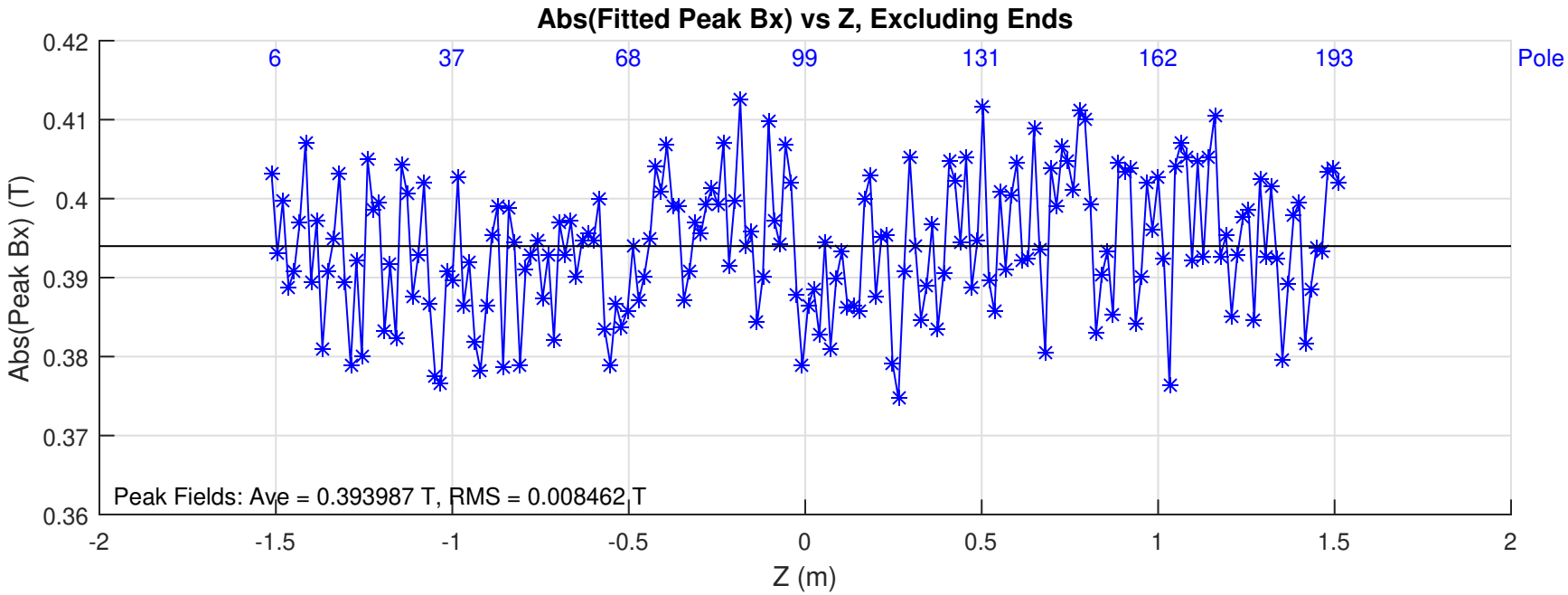
Parameters:
INPUT-FILE-DIR =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\Repeat 2014 Measurements\Data Set 2 Run 050\LP13F\KI
INPUT-FILE-NAME =hall2-anal-probe1-field.dat
INPUT-FILE-TYPE =ZBXYZH
CORR-REQUIRED =0
GAMMA =26671.59
NOM-LAMBDA-U =0
NOM-K-VALUE =0
NOM-LAMBDA-R =0
NUM-POLES =196
NUM-END-POLES =4
CELL-LENGTH =3.656

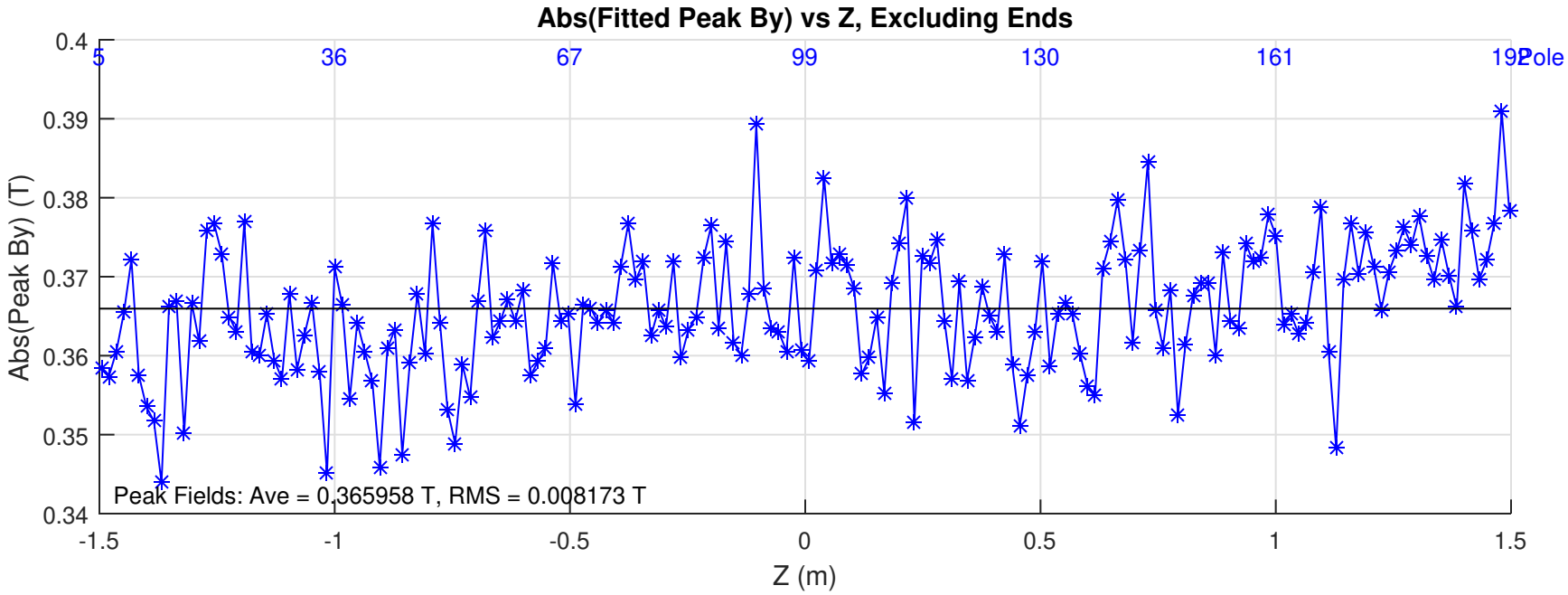

Bx, By, Bz vs Zm
Bx (T)
0.5
0
-0.5
By (T)
0.4
0.2
0
-0.2
-0.4
Bz (T)
2
1
0
-1
-2
0
0.5
1
1.5
2
2.5
3
3.5
Zm Measurement Position (m)

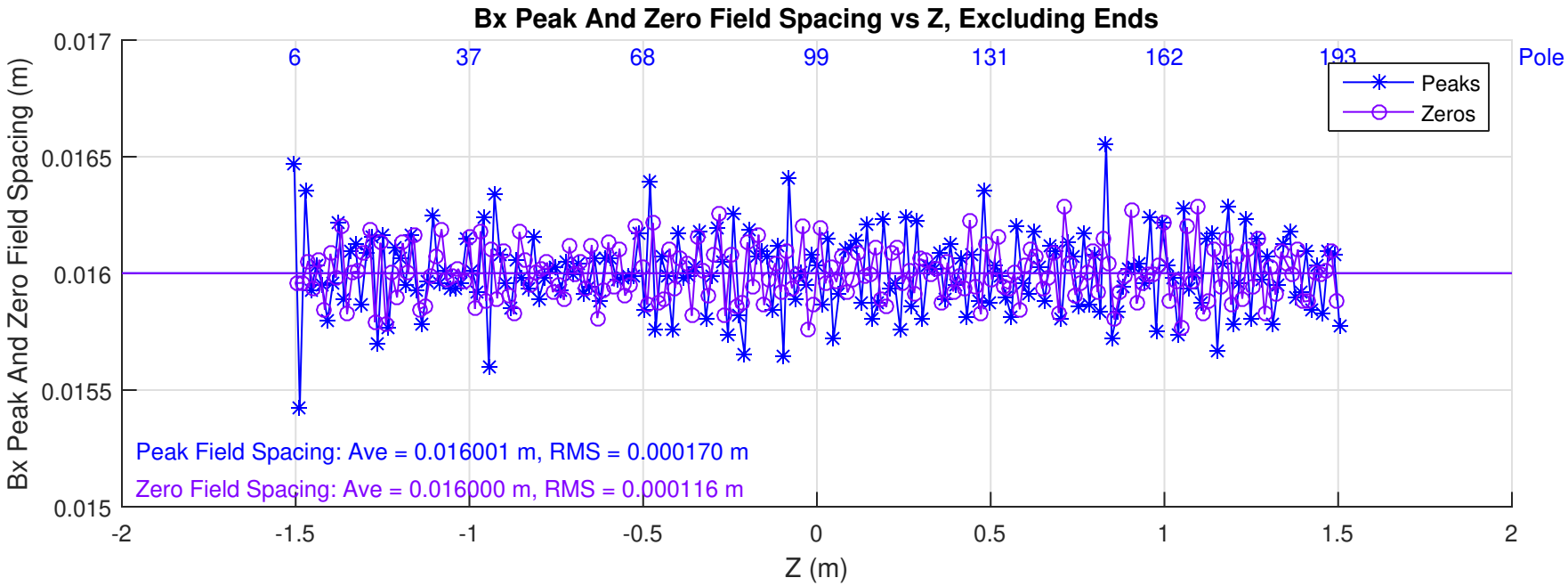

Bx and By vs Z
5
36
67
99
130
161
192
Pole
Bx
By
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
Bx, By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

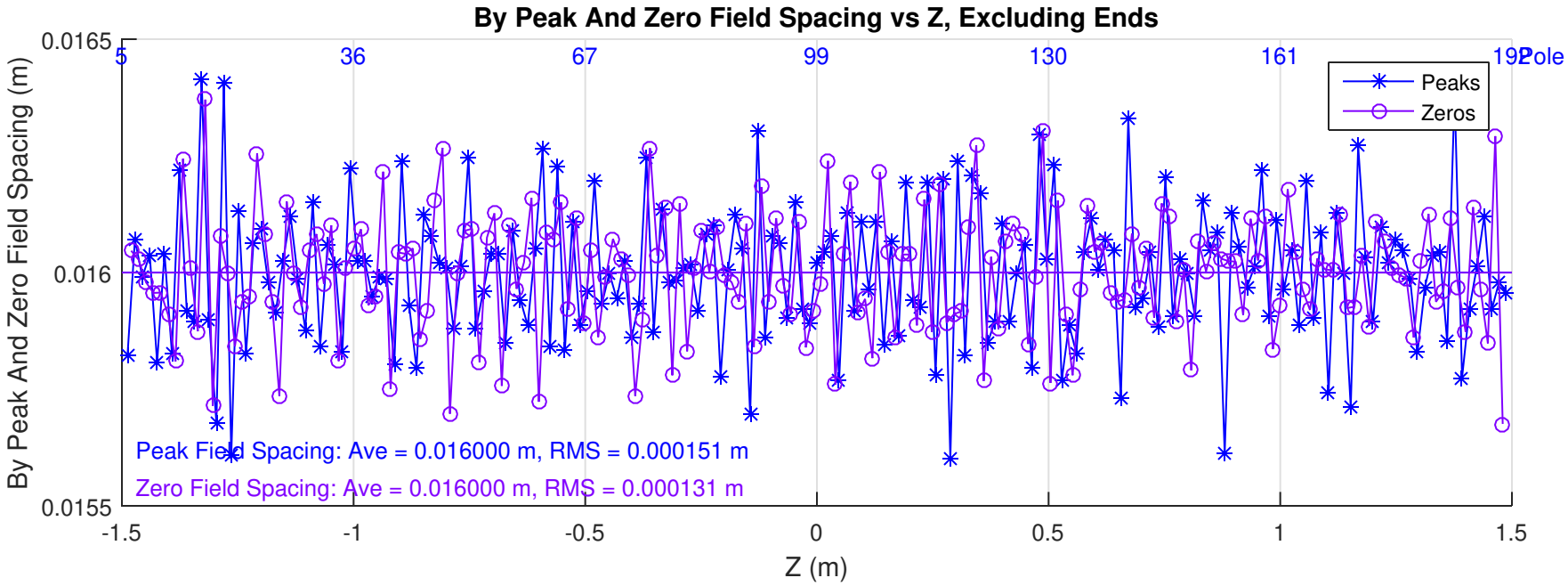

Bx vs Z With Fitted Peaks And Zeros
6
37
68
99
131
162
193
Pole
0.5
0
-0.5
Bx (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

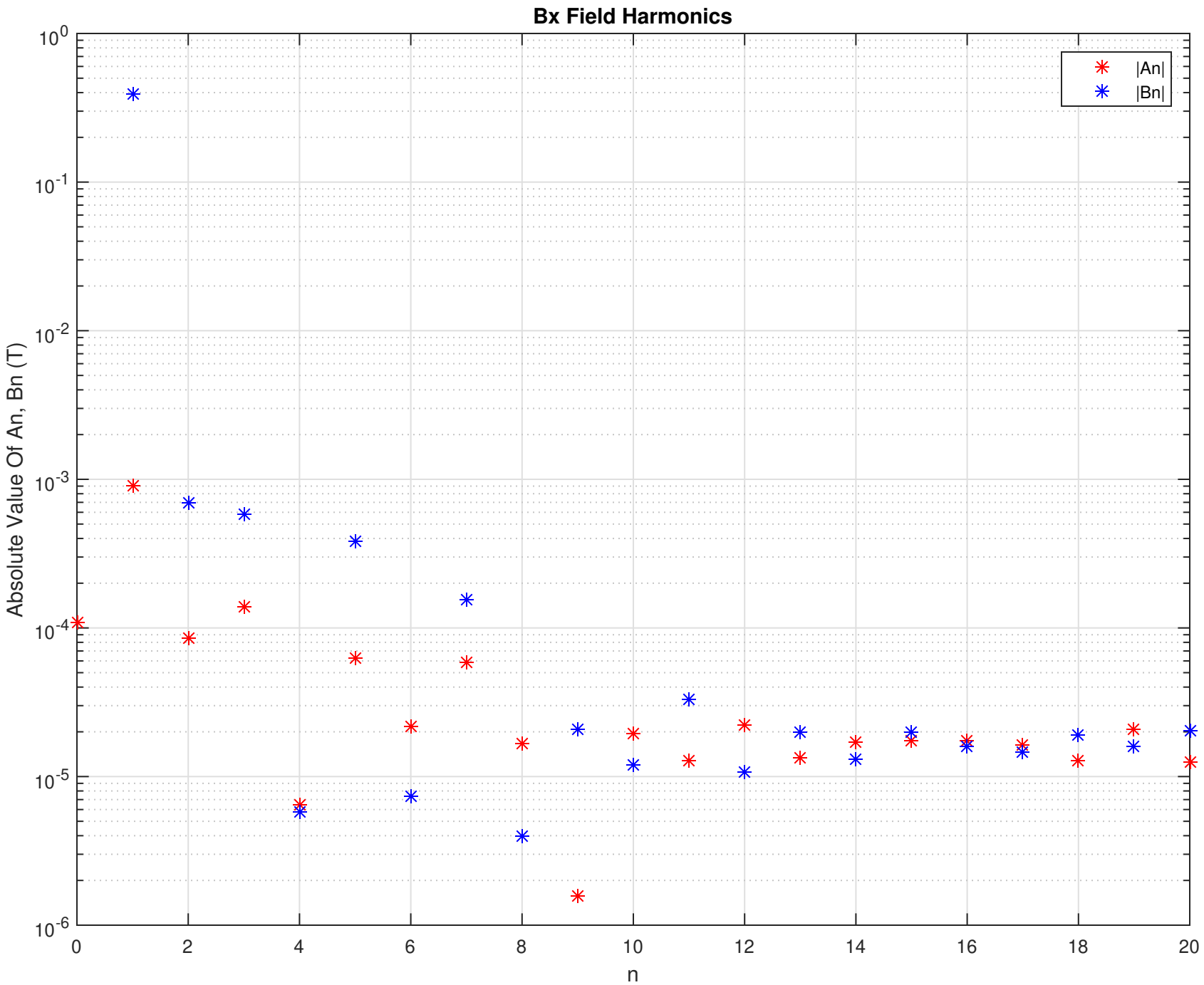

By vs Z With Fitted Peaks And Zeros
5
36
67
99
130
161
192
Pole
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

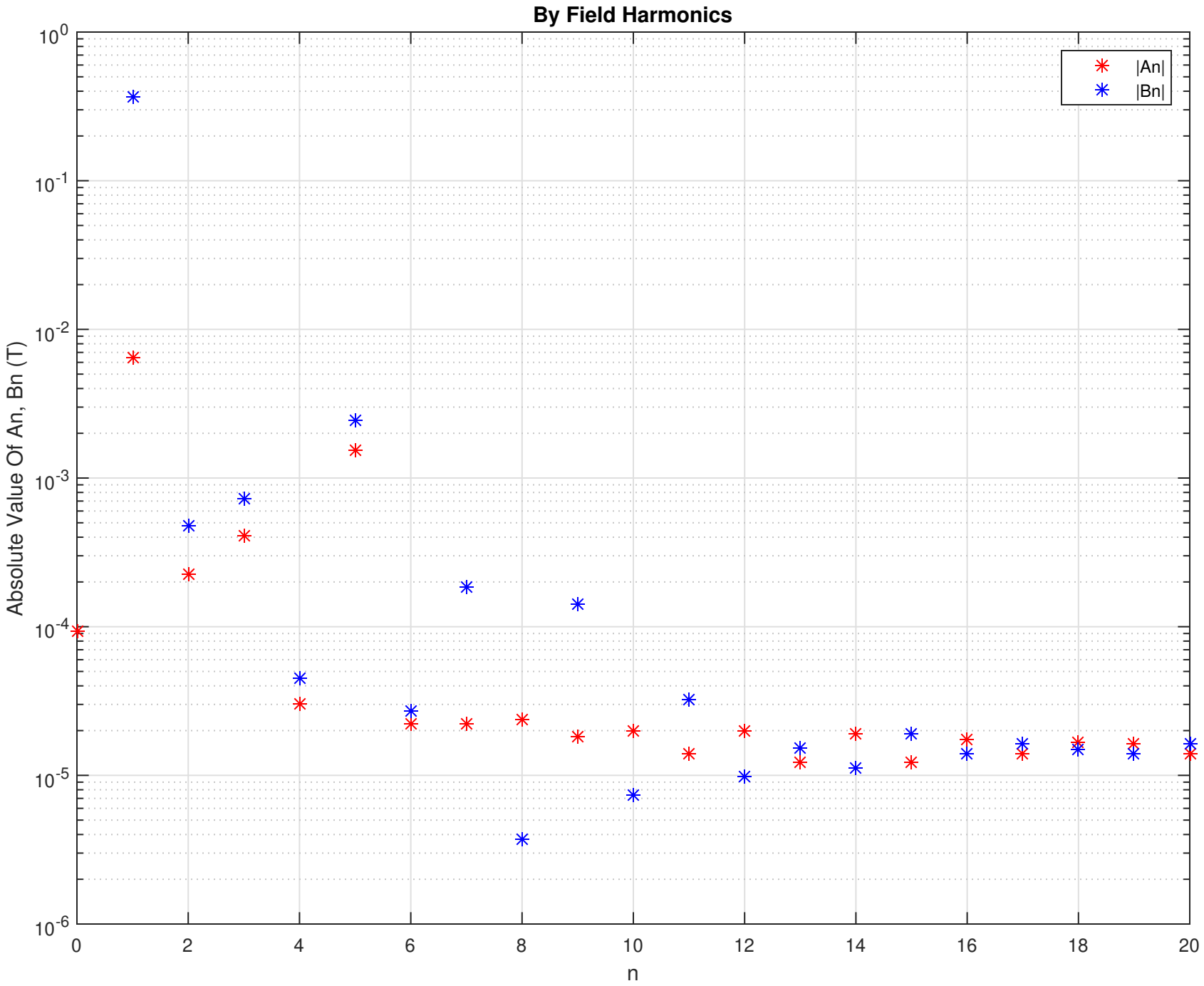

Abs(Fitted Peak Bx) vs Z, Excluding Ends
6
37
68
99
131
162
193
Pole
0.42
0.41
0.4
0.39
0.38
0.37
0.36
Abs(Peak Bx) (T)
Peak Fields: Ave = 0.393987 T, RMS = 0.008462 T
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

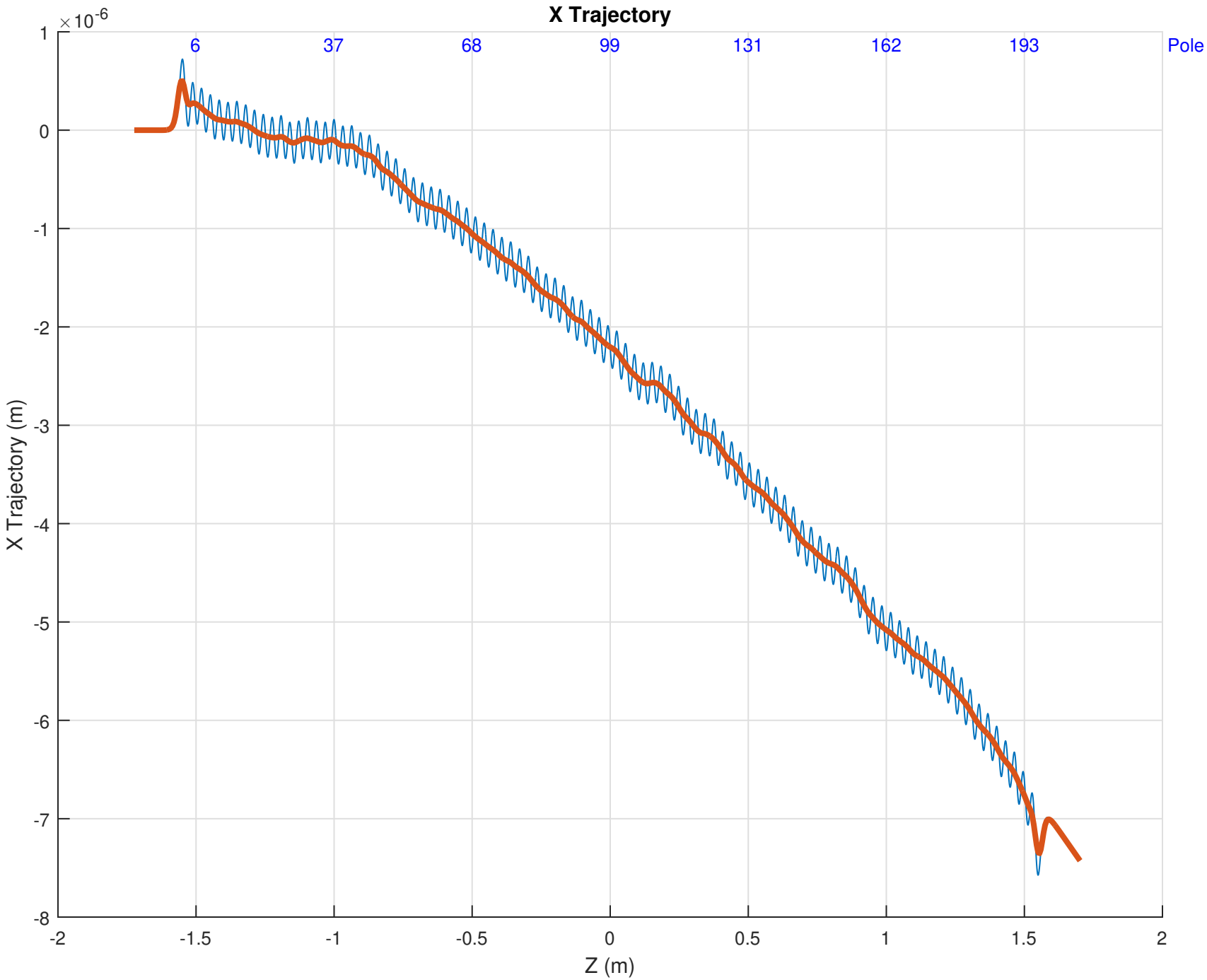

Abs(Fitted Peak By) vs Z, Excluding Ends
5
36
67
99
130
161
192
Pole
0.4
0.39
0.38
0.37
0.36
0.35
0.34
Abs(Peak By) (T)
Peak Fields: Ave = 0.365958 T, RMS = 0.008173 T
-1.5
-1
-0.5
0
0.5
1
1.5
Z (m)

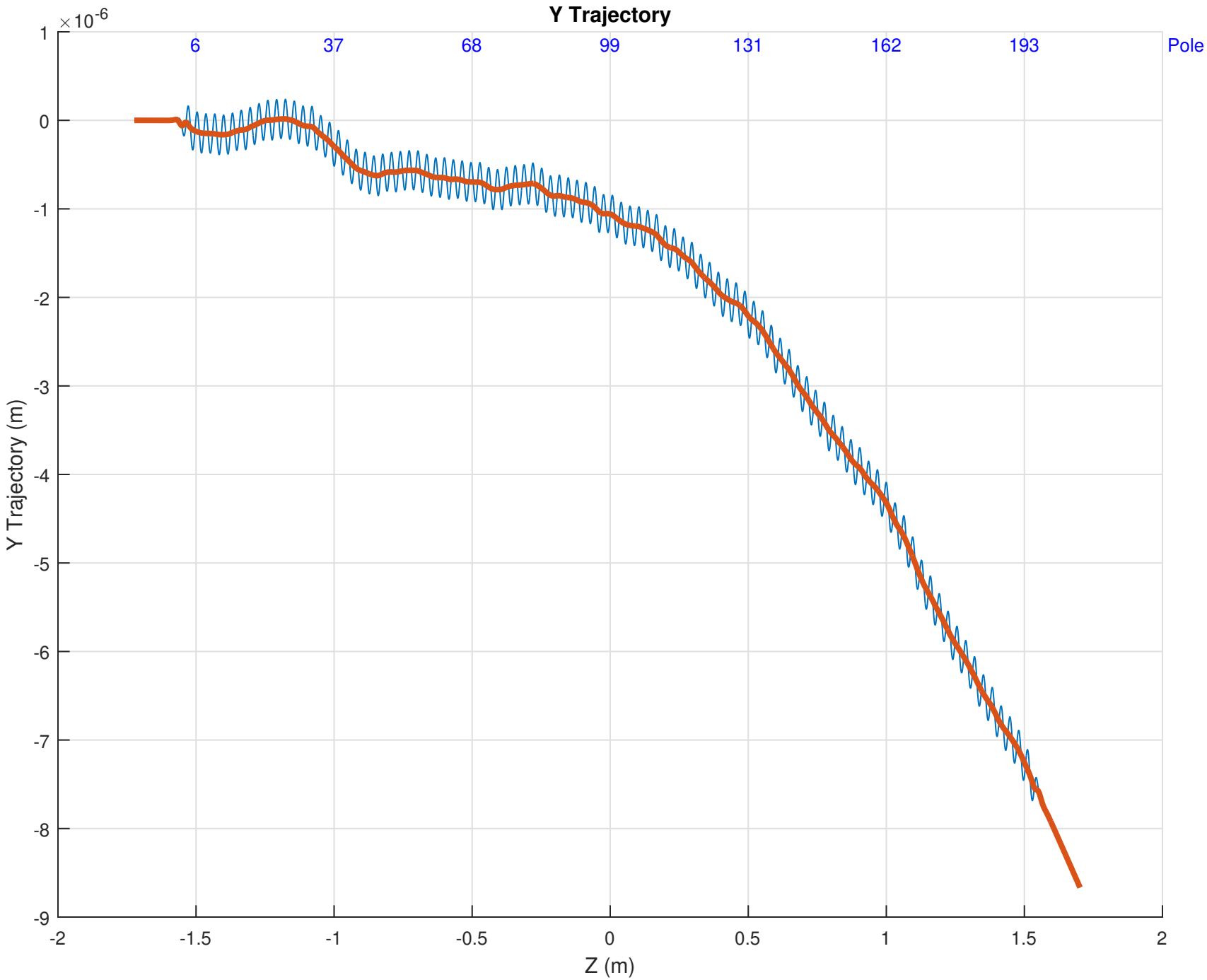

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
0.017
0.0165
0.016
0.0155
0.015
6
37
68
99
131
162
193
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.016001 m, RMS = 0.000170 m
Zero Field Spacing: Ave = 0.016000 m, RMS = 0.000116 m
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

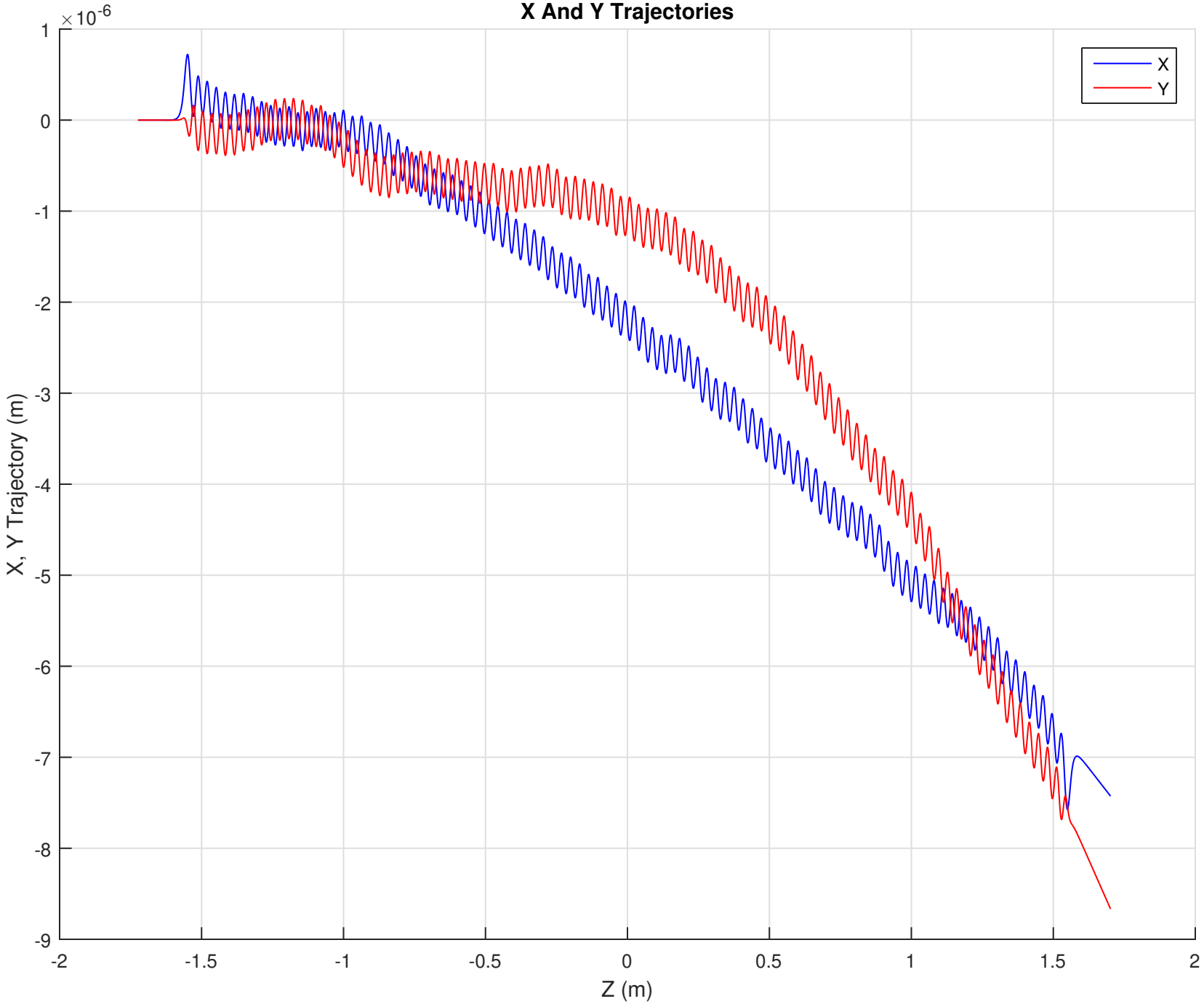

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
0.0165
0.016
0.0155
5
36
67
99
130
161
192
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.016000 m, RMS = 0.000151 m
Zero Field Spacing: Ave = 0.016000 m, RMS = 0.000131 m
-1.5
-1
-0.5
0
0.5
1
1.5
Z (m)

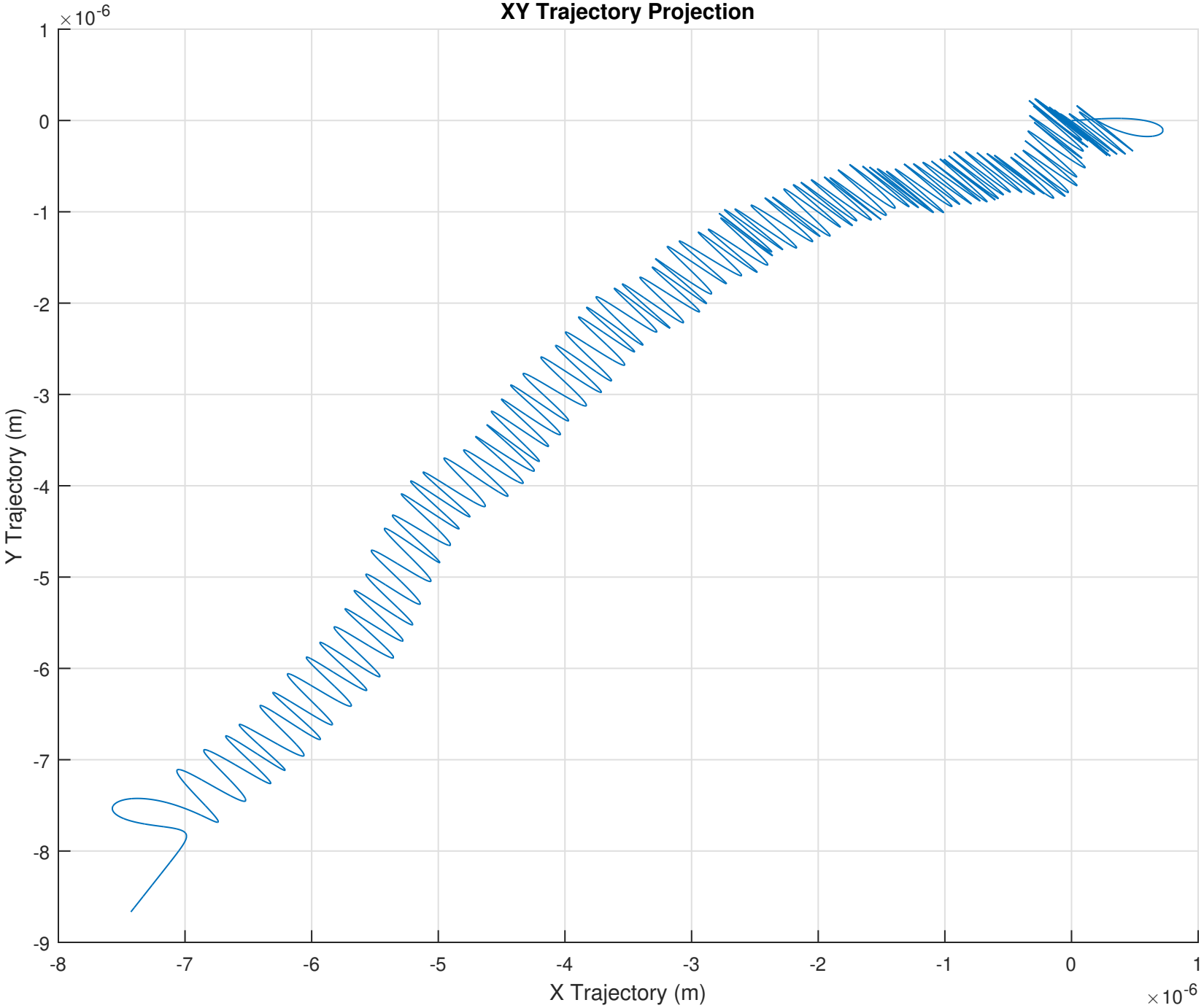

Bx Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
0
2
4
6
8
10
12
14
16
18
20

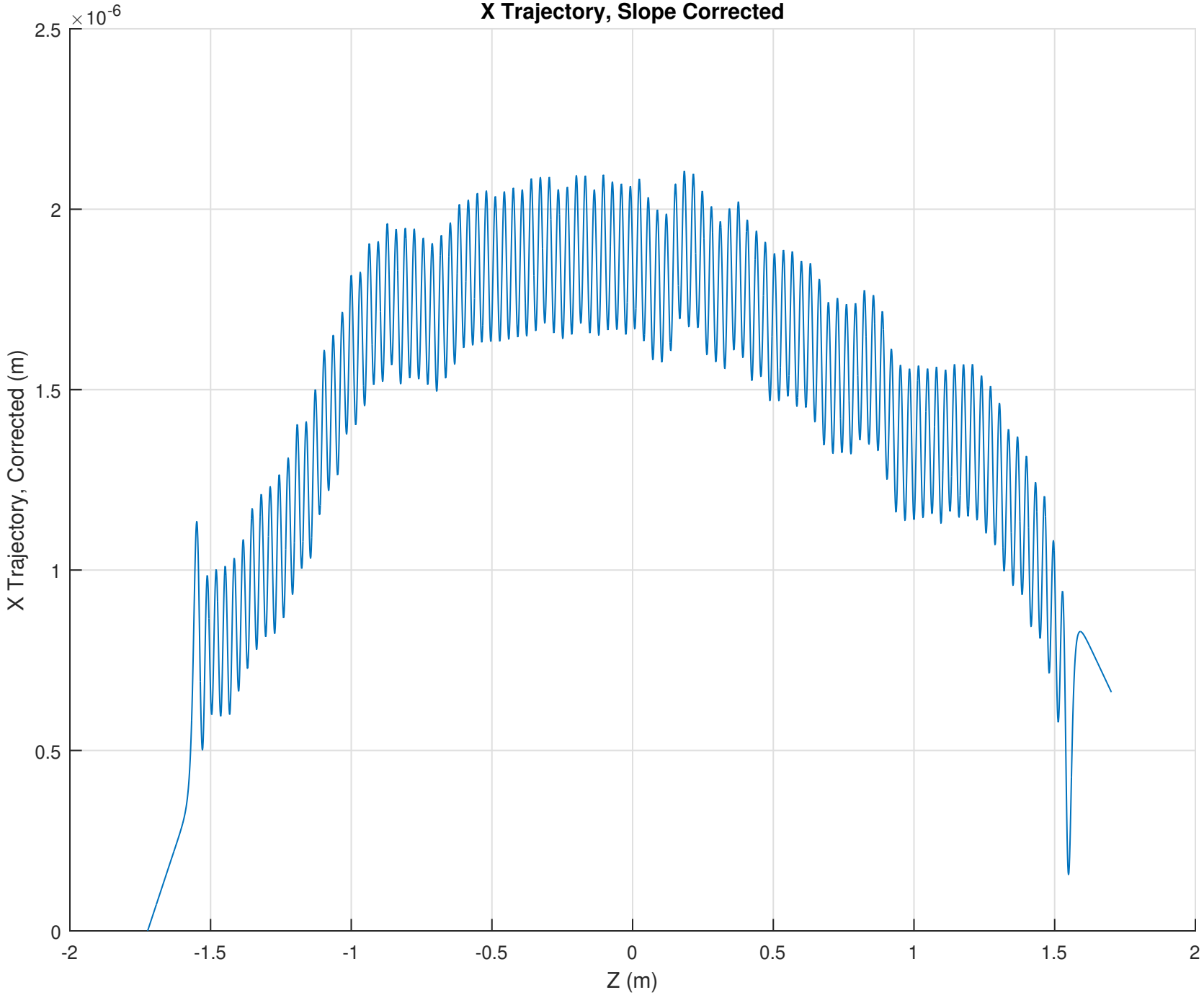

By Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
$10^{0}$
$10^{-1}$
$10^{-2}$
$10^{-3}$
$10^{-4}$
$10^{-5}$
$10^{-6}$
0
2
4
6
8
10
12
14
16
18
20

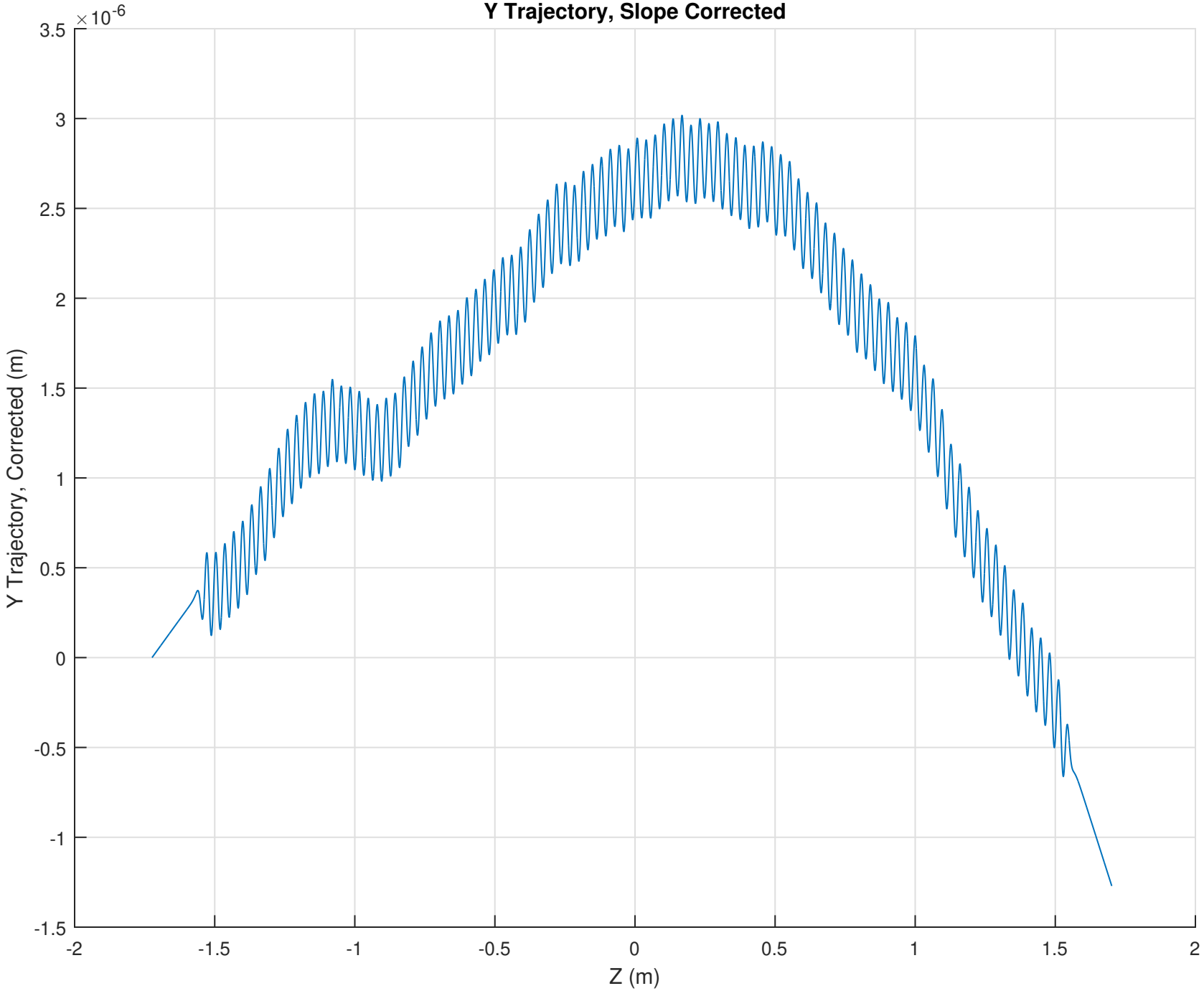

X Trajectory
×10-6
1
0
-1
-2
-3
-4
-5
-6
-7
-8
6
37
68
99
131
162
193
Pole
X Trajectory (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

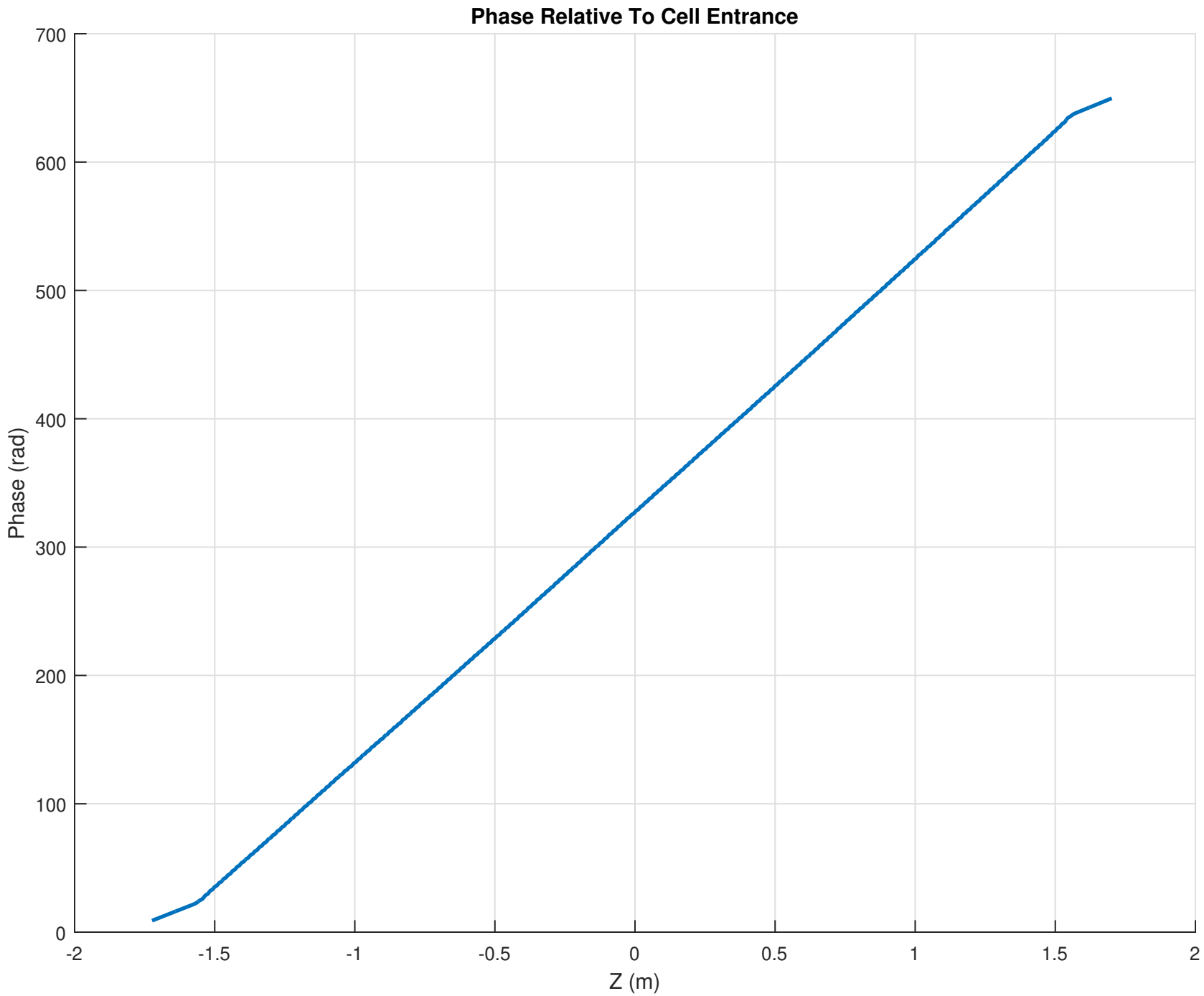

Y Trajectory
×10-6
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
6
37
68
99
131
162
193
Pole
Y Trajectory (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

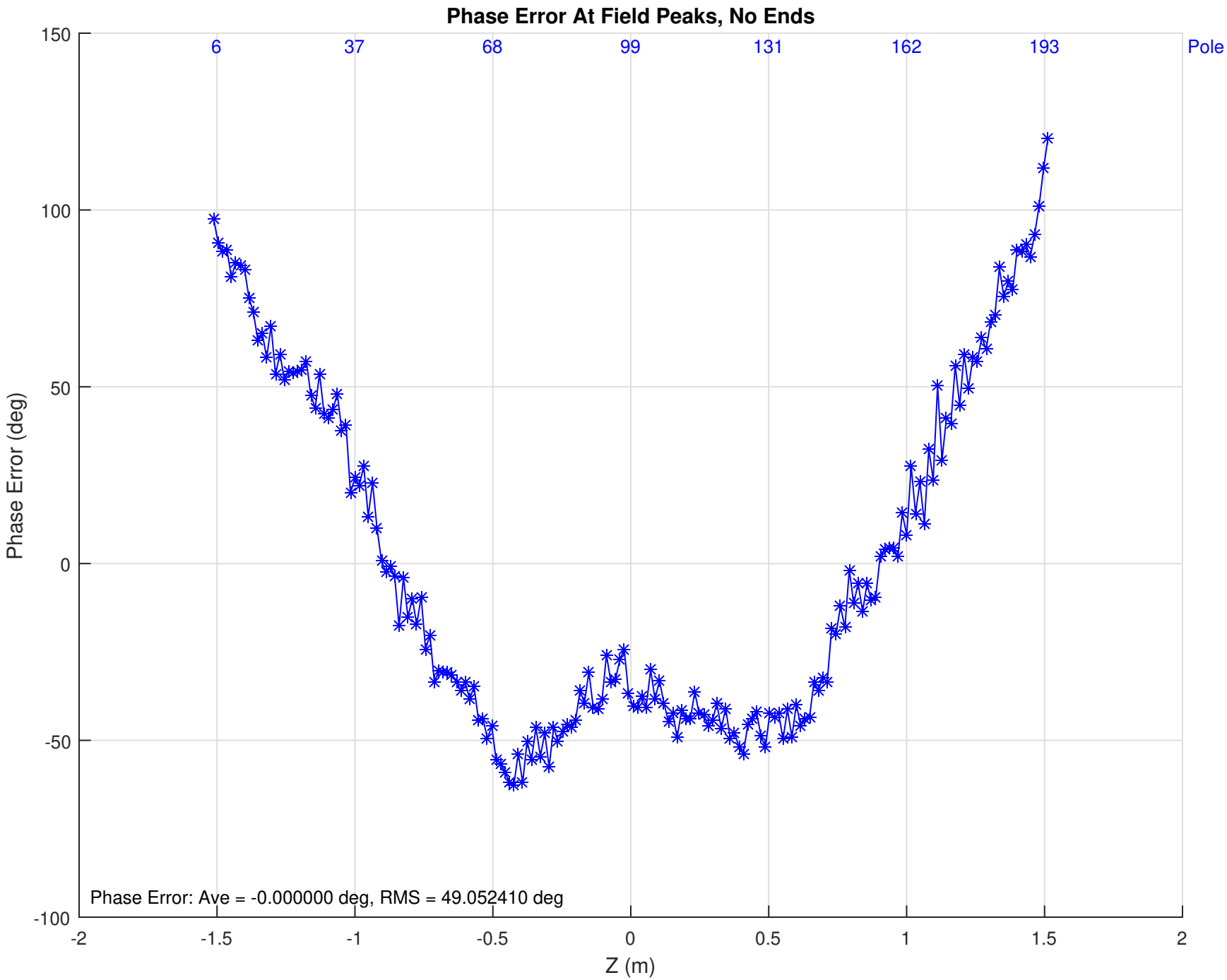

X And Y Trajectories
×10-6
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
X, Y Trajectory (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)
X
Y

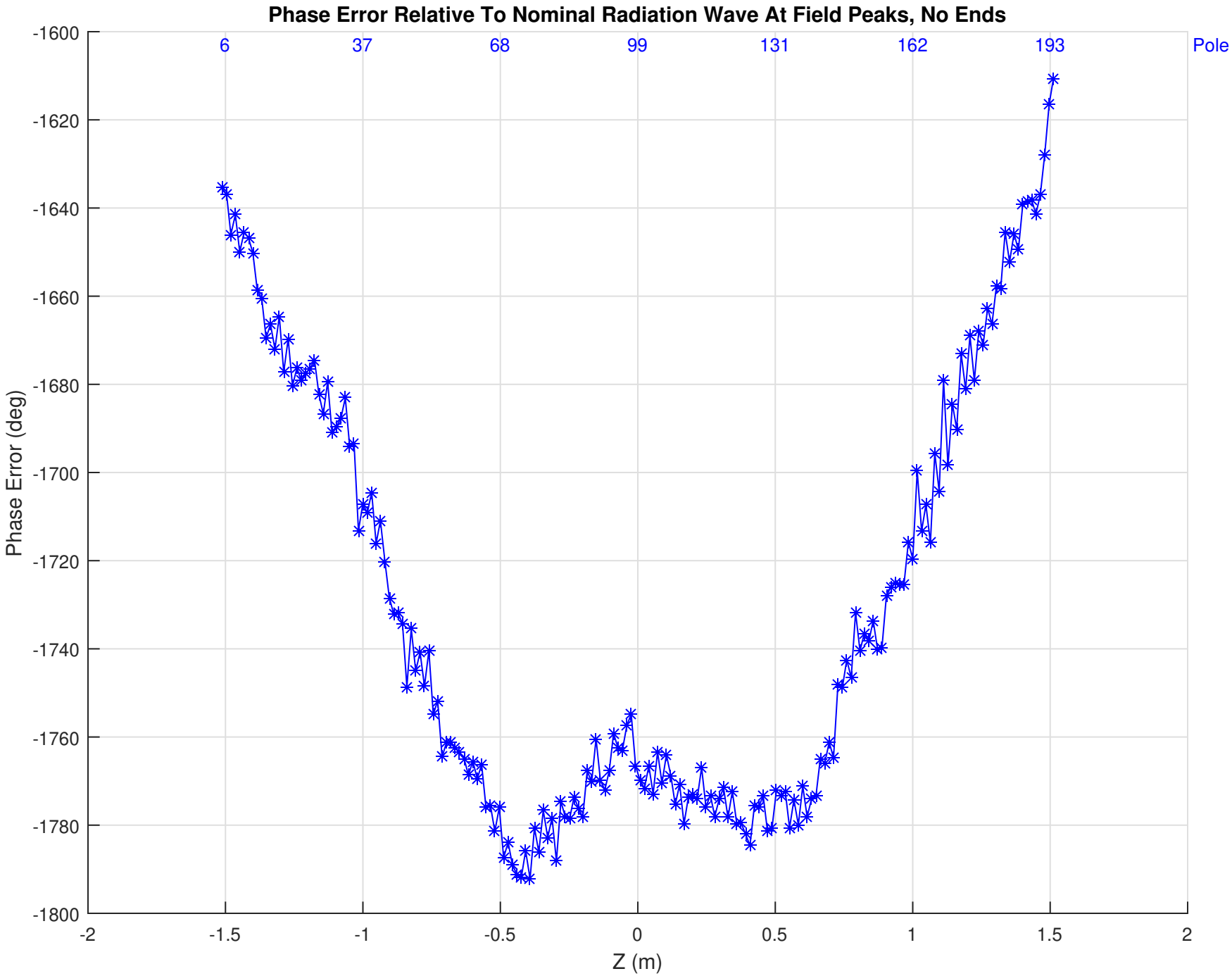

XY Trajectory Projection
×10-6
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
Y Trajectory (m)
-8
-7
-6
-5
-4
-3
-2
-1
0
1
X Trajectory (m)
×10-6

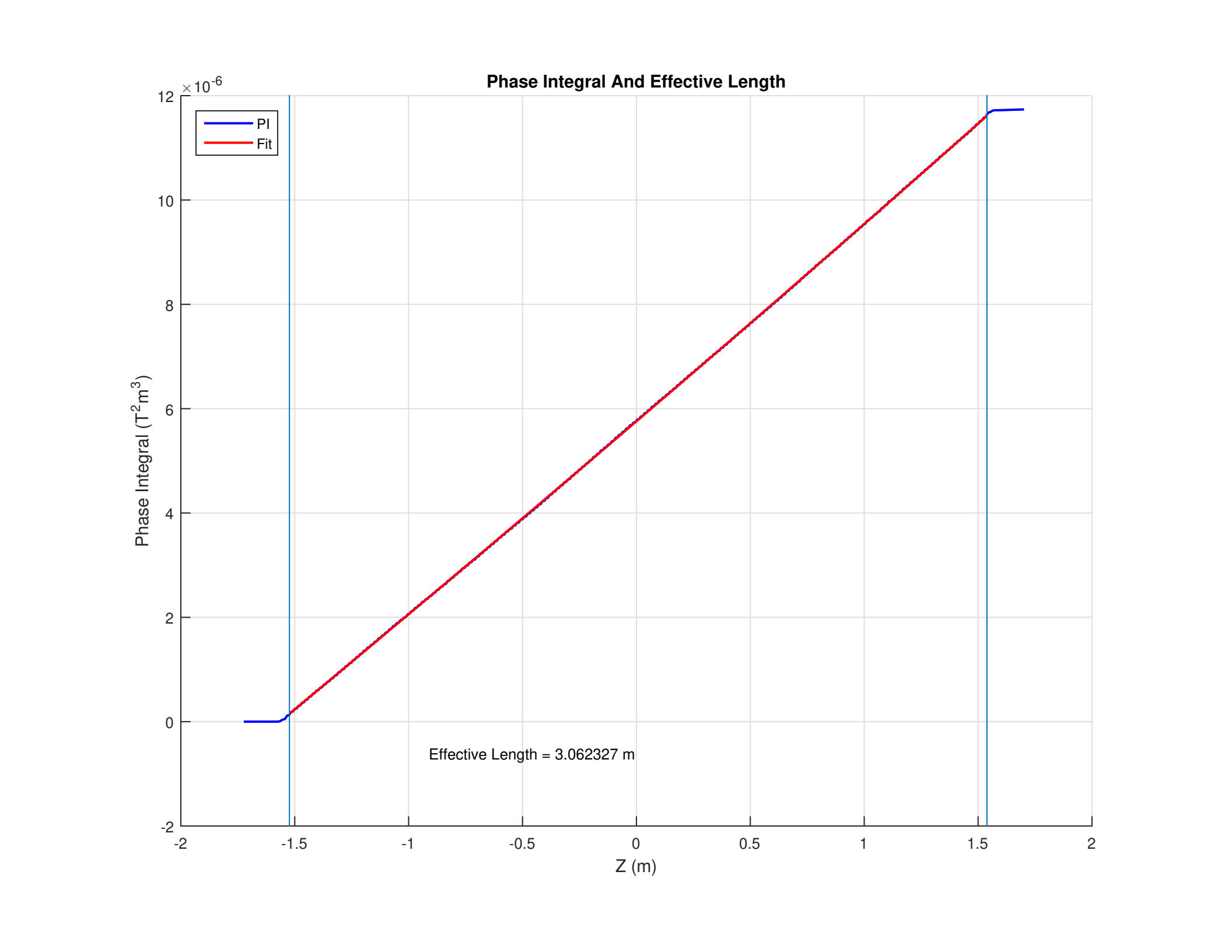

X Trajectory, Slope Corrected
×10-6
2.5
2
1.5
1
0.5
0
X Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

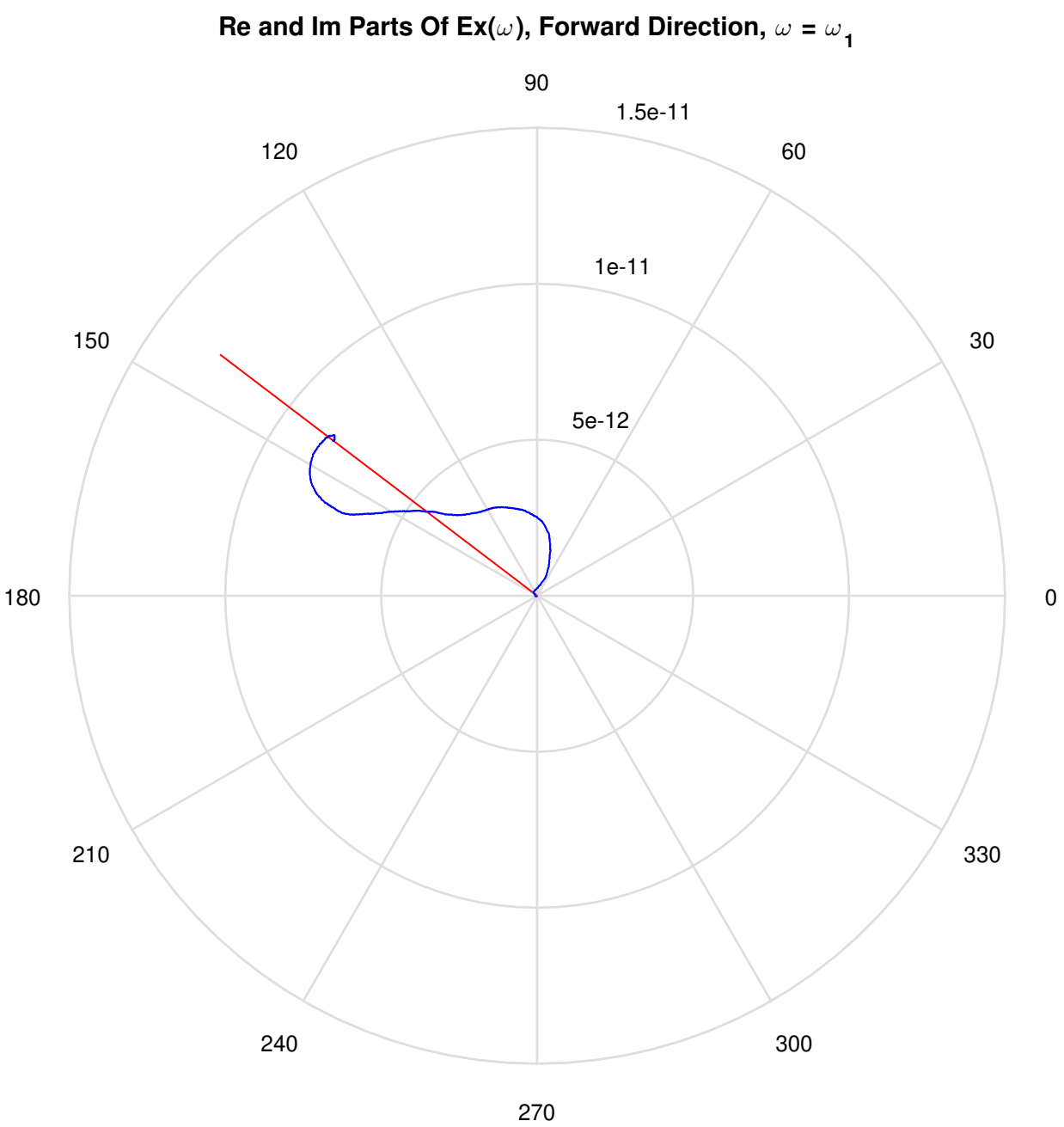

Y Trajectory, Slope Corrected
×10-6
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
Y Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

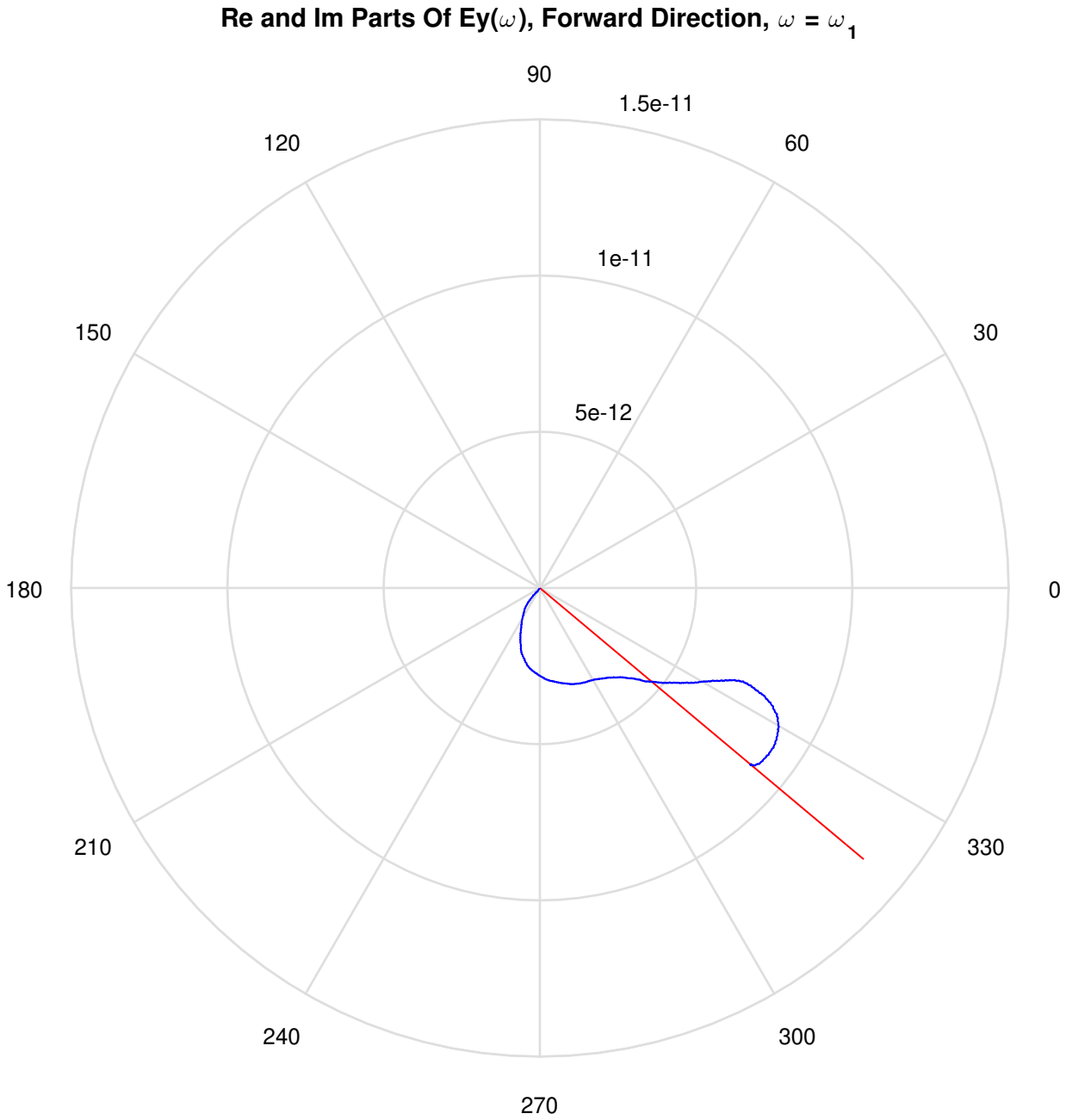

Phase Relative To Cell Entrance
Phase (rad)
Z (m)
700
600
500
400
300
200
100
0
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

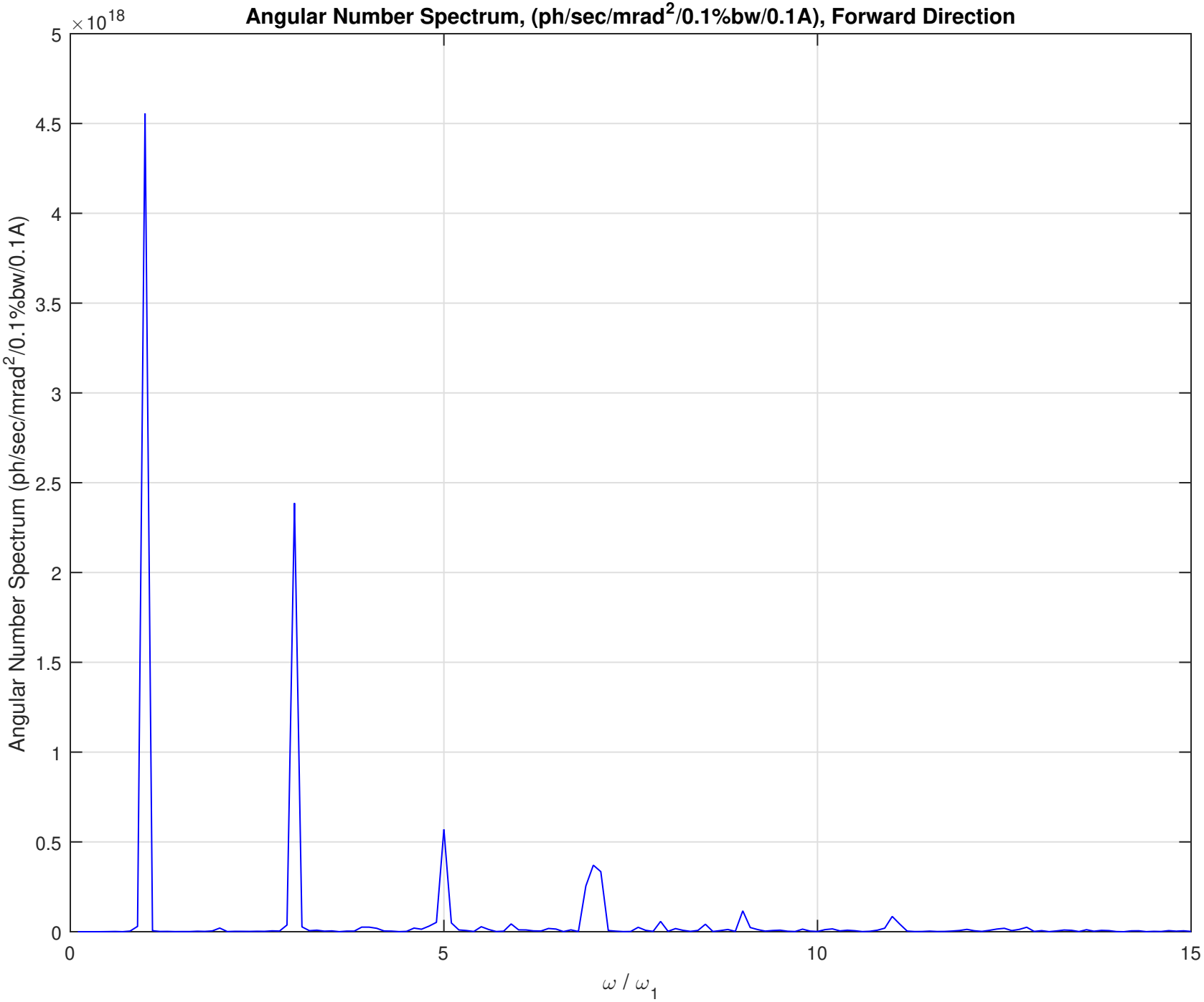

Phase Error At Field Peaks, No Ends
6
37
68
99
131
162
193
Pole
150
100
50
0
-50
-100
Phase Error (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)
Phase Error: Ave = -0.000000 deg, RMS = 49.052410 deg

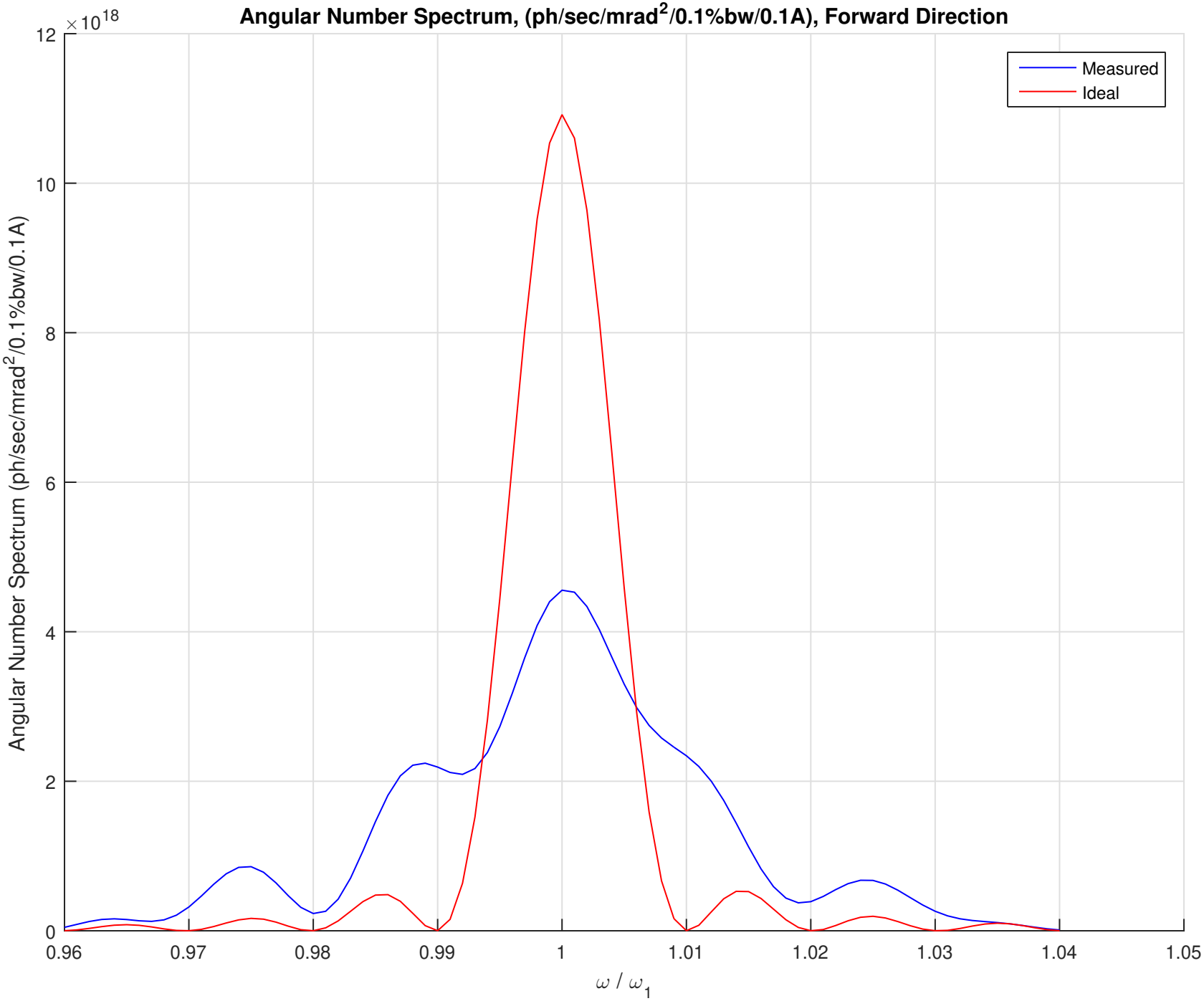

Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
6
37
68
99
131
162
193
Pole
-1600
-1620
-1640
-1660
-1680
-1700
-1720
-1740
-1760
-1780
-1800
Phase Error (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

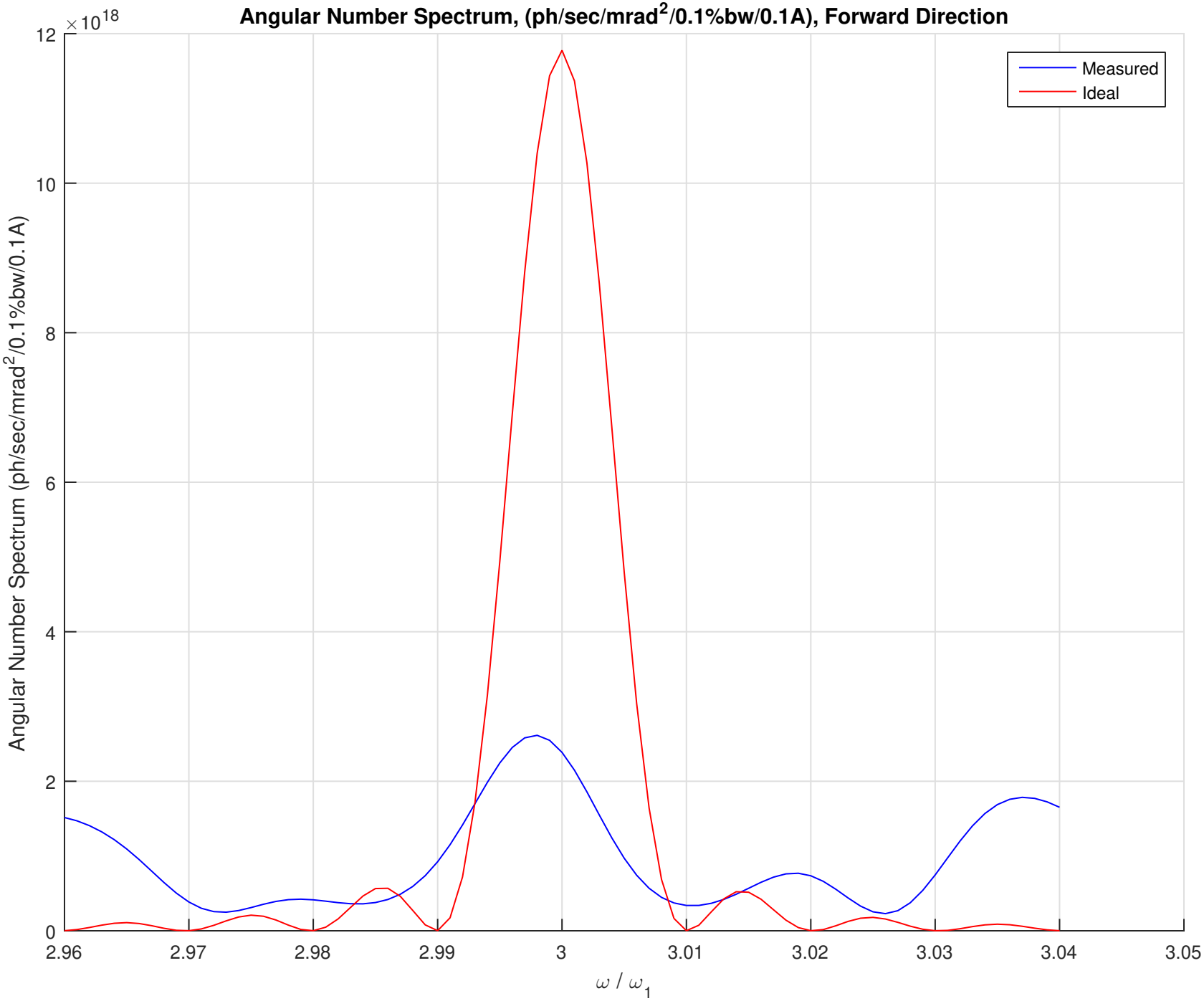

Phase Integral And Effective Length
×10-6
12
10
8
6
4
2
0
-2
PI
Fit
Phase Integral (T2m3)
Effective Length = 3.062327 m
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

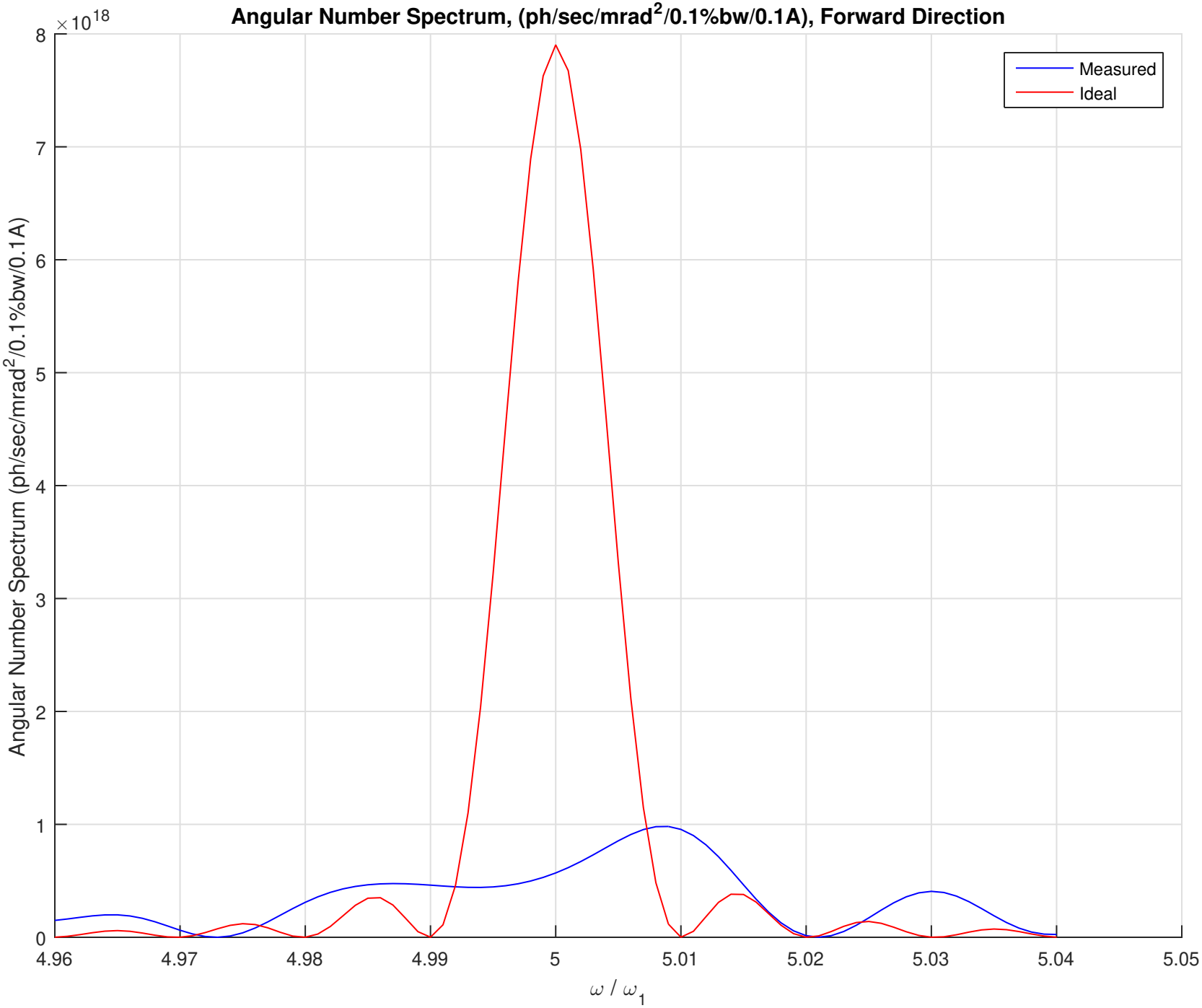

Re and Im Parts Of Ex(ω), Forward Direction, ω = ω1
90
1.5e-11
120
60
1e-11
150
30
5e-12
180
0
210
330
240
300
270


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


Angular Number Spectrum, (ph/sec/mrad$^2$/0.1%bw/0.1A), Forward Direction
$\times 10^{18}$
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Angular Number Spectrum (ph/sec/mrad$^2$/0.1%bw/0.1A)
0
5
10
15
$\omega$ / $\omega_1$


Angular Number Spectrum, (ph/sec/mrad$^2$/0.1%bw/0.1A), Forward Direction
$\times 10^{18}$
12
10
8
6
4
2
0
Angular Number Spectrum (ph/sec/mrad$^2$/0.1%bw/0.1A)
0.96
0.97
0.98
0.99
1
1.01
1.02
1.03
1.04
1.05
$\omega$ / $\omega_1$
Measured
Ideal


Angular Number Spectrum, (ph/sec/mrad$^2$/0.1%bw/0.1A), Forward Direction
$\times 10^{18}$
12
10
8
6
4
2
0
Angular Number Spectrum (ph/sec/mrad$^2$/0.1%bw/0.1A)
2.96
2.97
2.98
2.99
3
3.01
3.02
3.03
3.04
3.05
$\omega$ / $\omega_1$
Measured
Ideal


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)
0
1
2
3
4
5
6
7
8
4.96
4.97
4.98
4.99
5
5.01
5.02
5.03
5.04
5.05
$\omega$ / $\omega_1$