SLAC Magnetic Measurements

EPU Analysis
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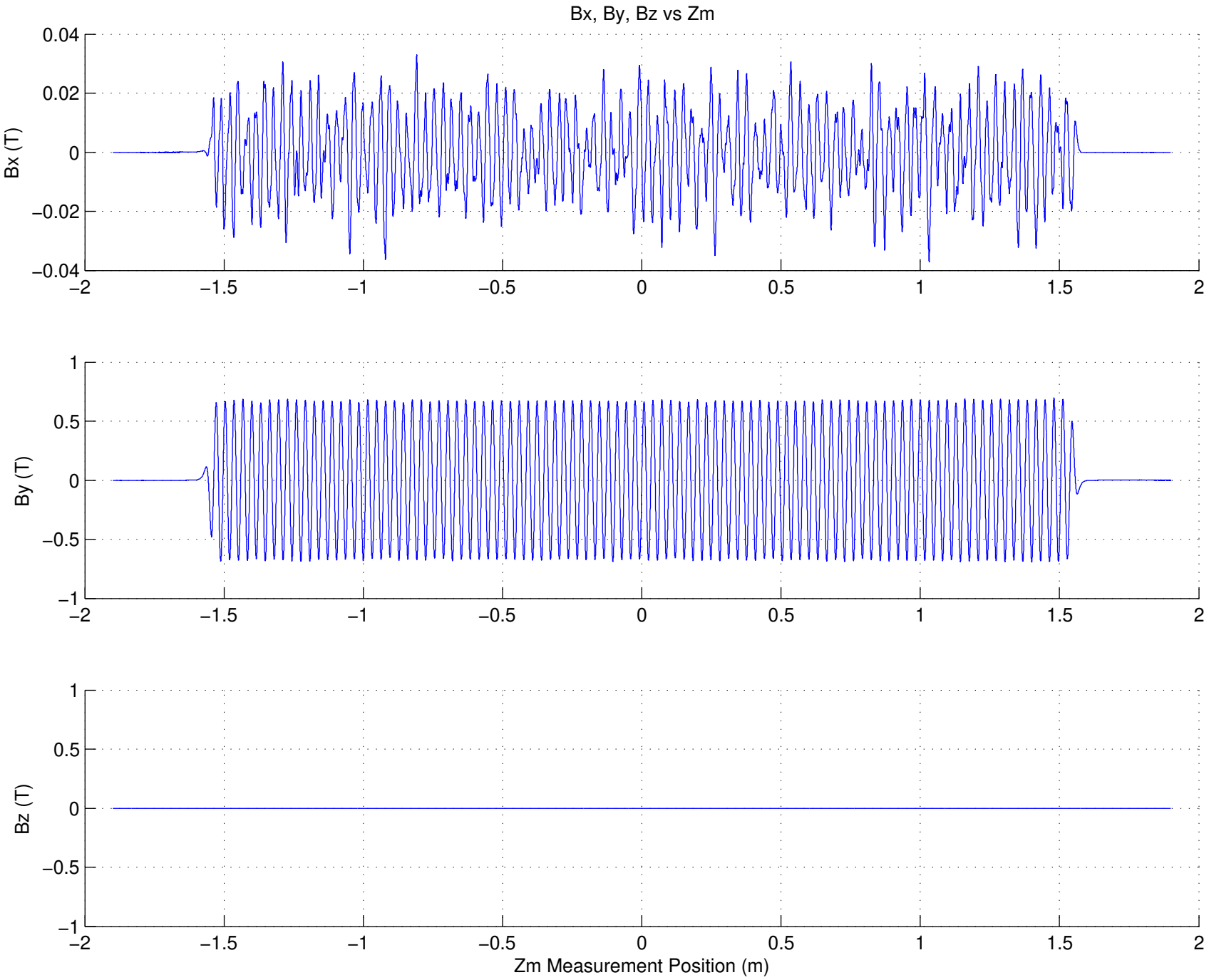
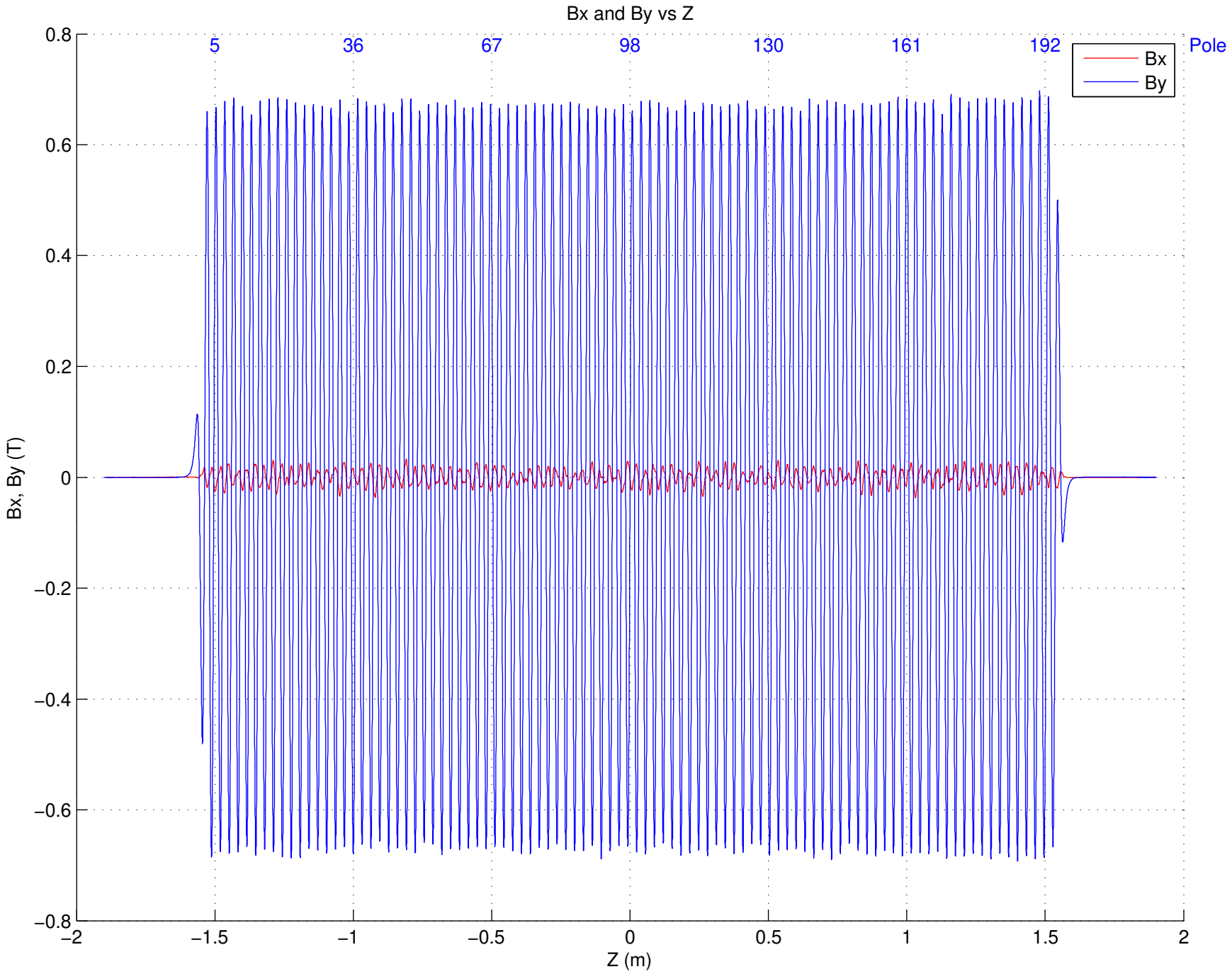
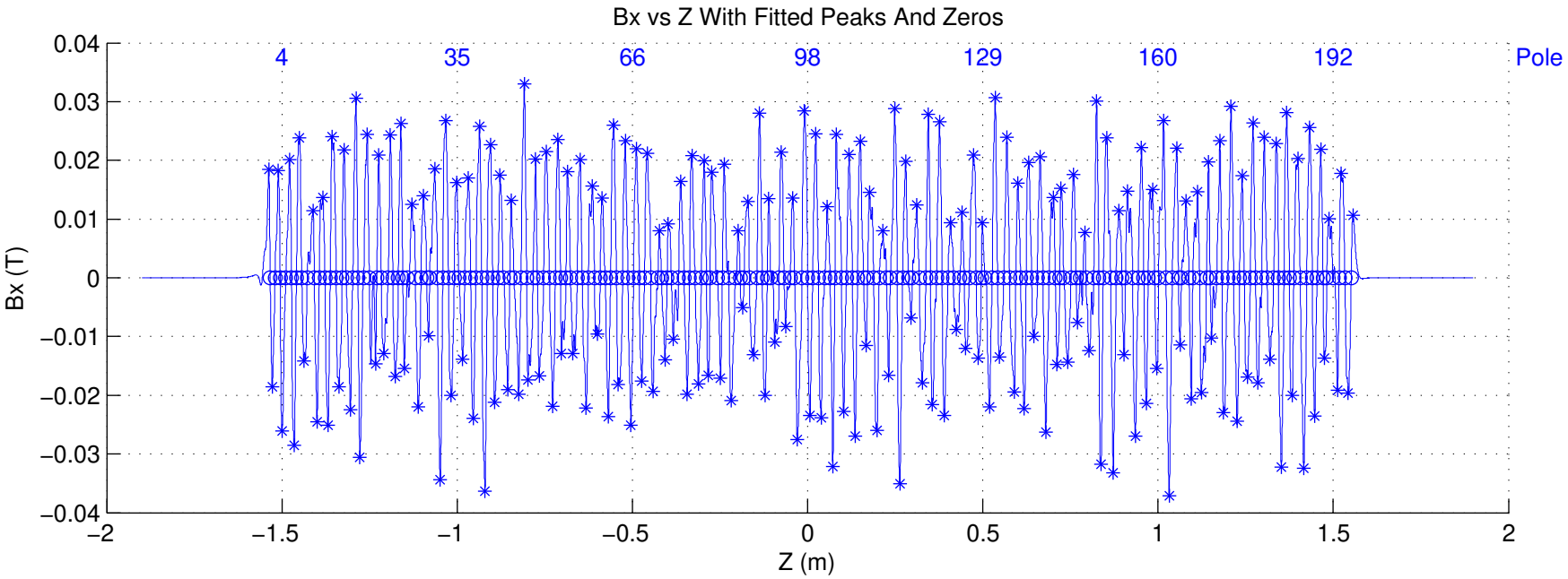
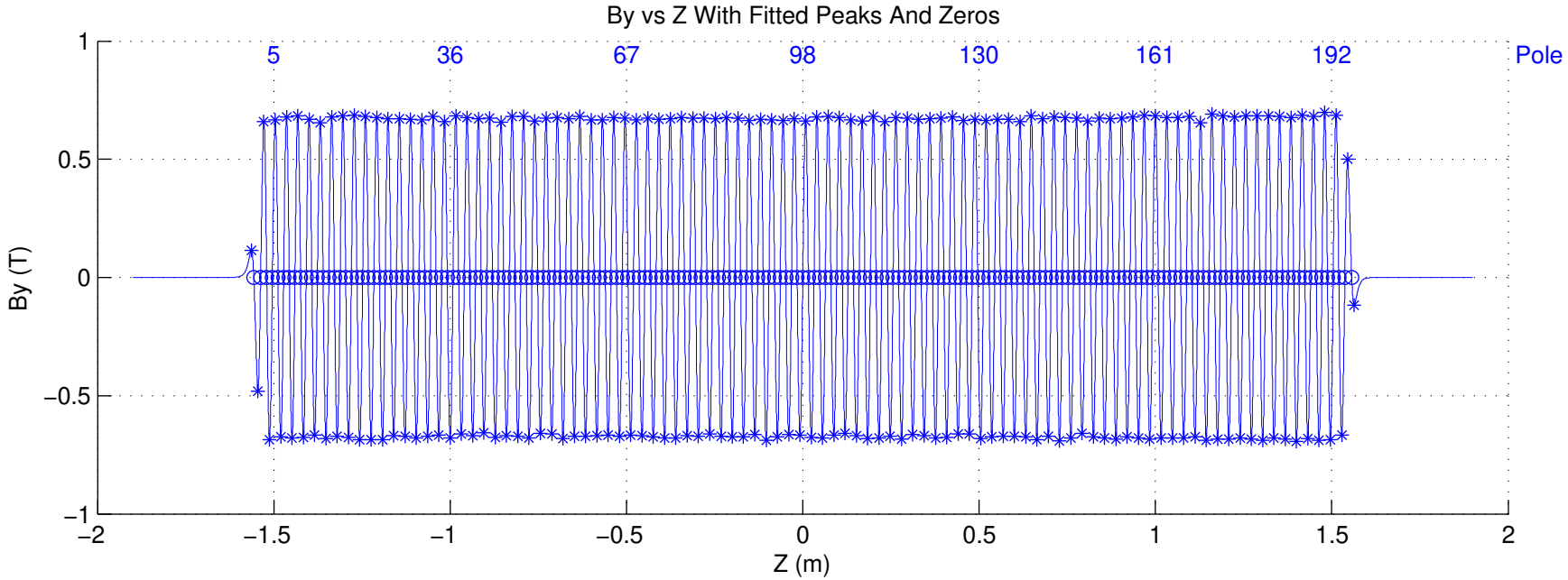
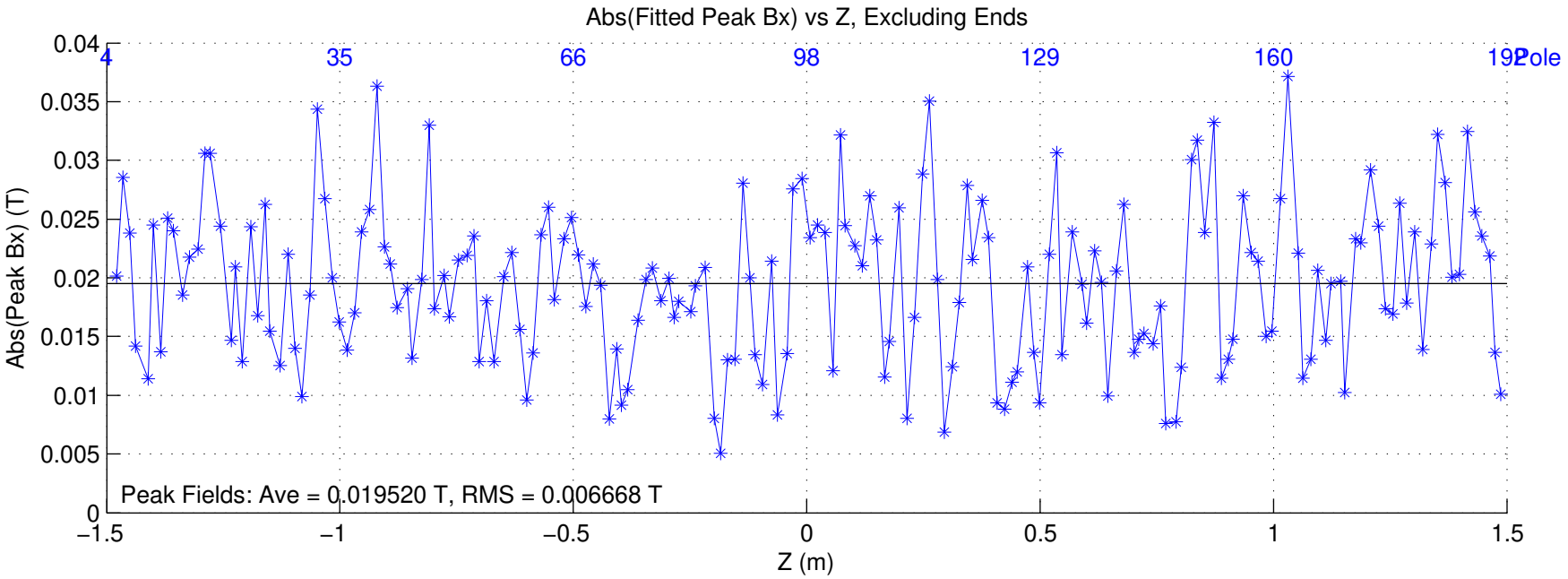
Parameters:
INPUT–FILE–DIR =V:\MET\MagServe\MagData\DELTA\Superpose Quadrants Q1 300microns\LPVMF\KR060
INPUT–FILE–NAME =superpose–quadrants.dat
INPUT–FILE–TYPE =ZBXYZH
CORR–REQUIRED =0
GAMMA =26671.59
NOM–LAMBDA–U =0
NOM–K–VALUE =0
NOM–LAMBDA–R =0
NUM–POLES =196
NUM–END–POLES =4
CELL–LENGTH =3.656

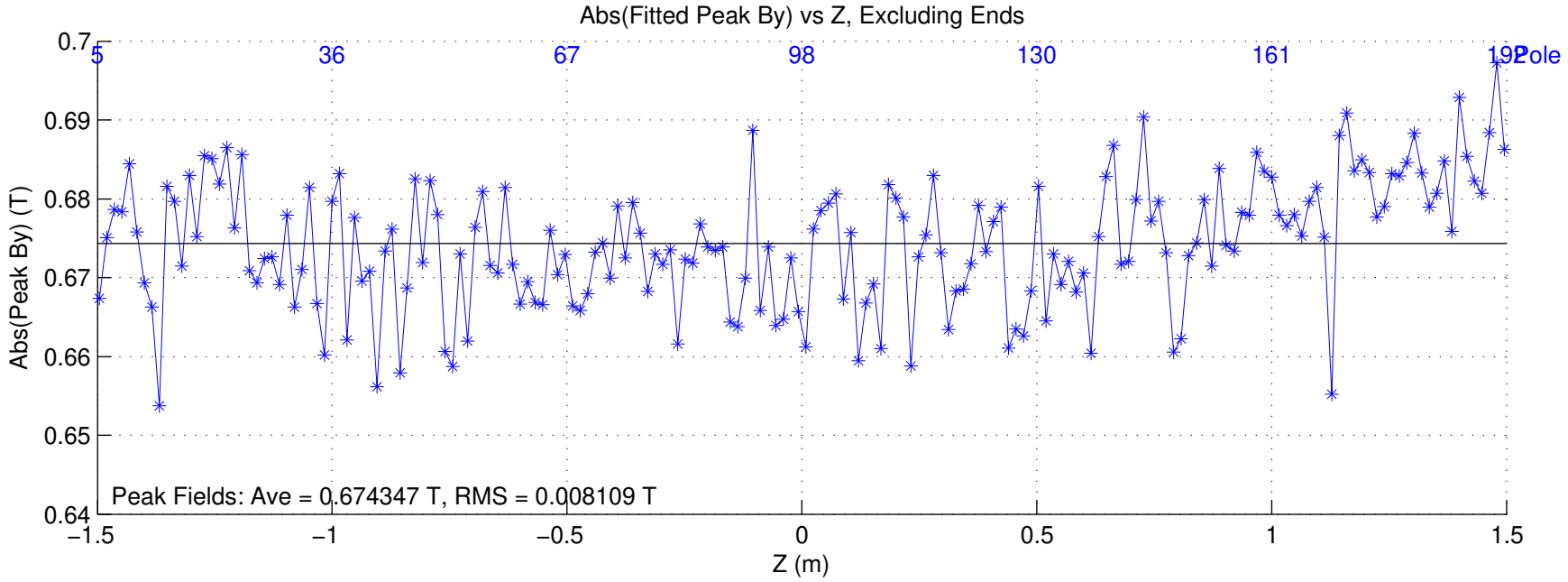

Bx, By, Bz vs Zm
Bx (T)
0.04
0.02
0
−0.02
−0.04
By (T)
1
0.5
0
−0.5
−1
Bz (T)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Zm Measurement Position (m)

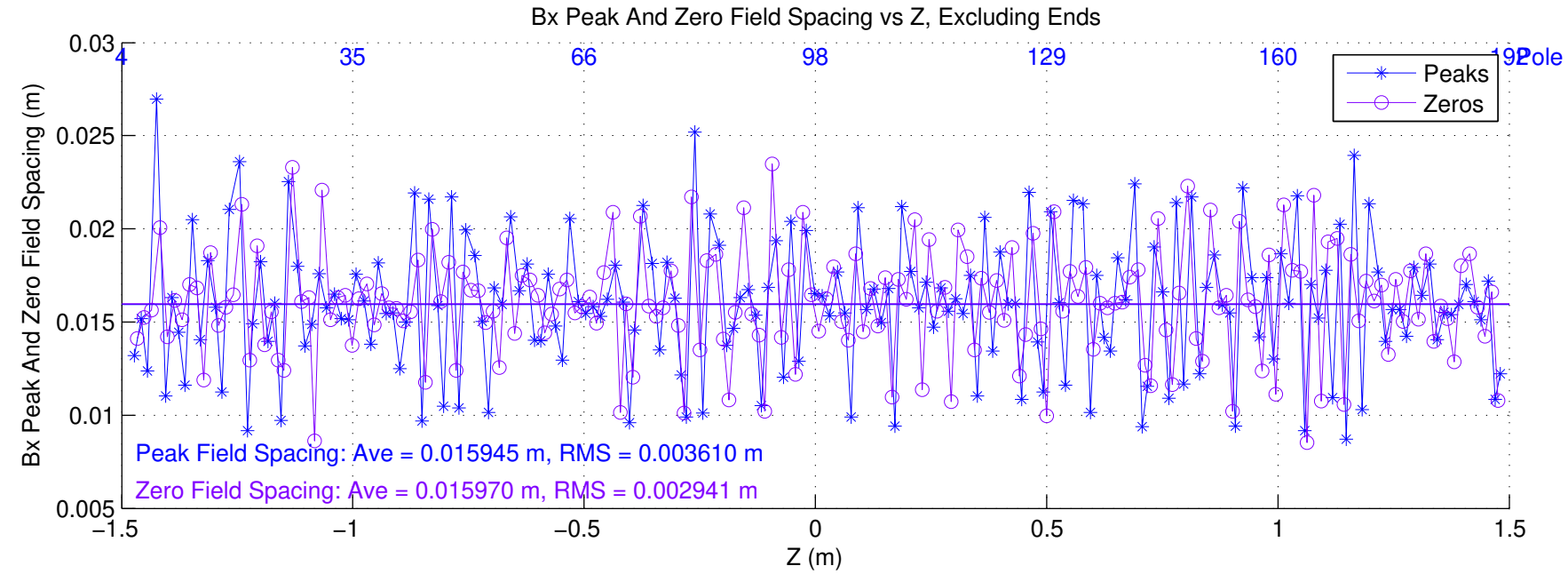

Bx and By vs Z
5
36
67
98
130
161
192
Pole
Bx
By
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
Bx, By (T)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

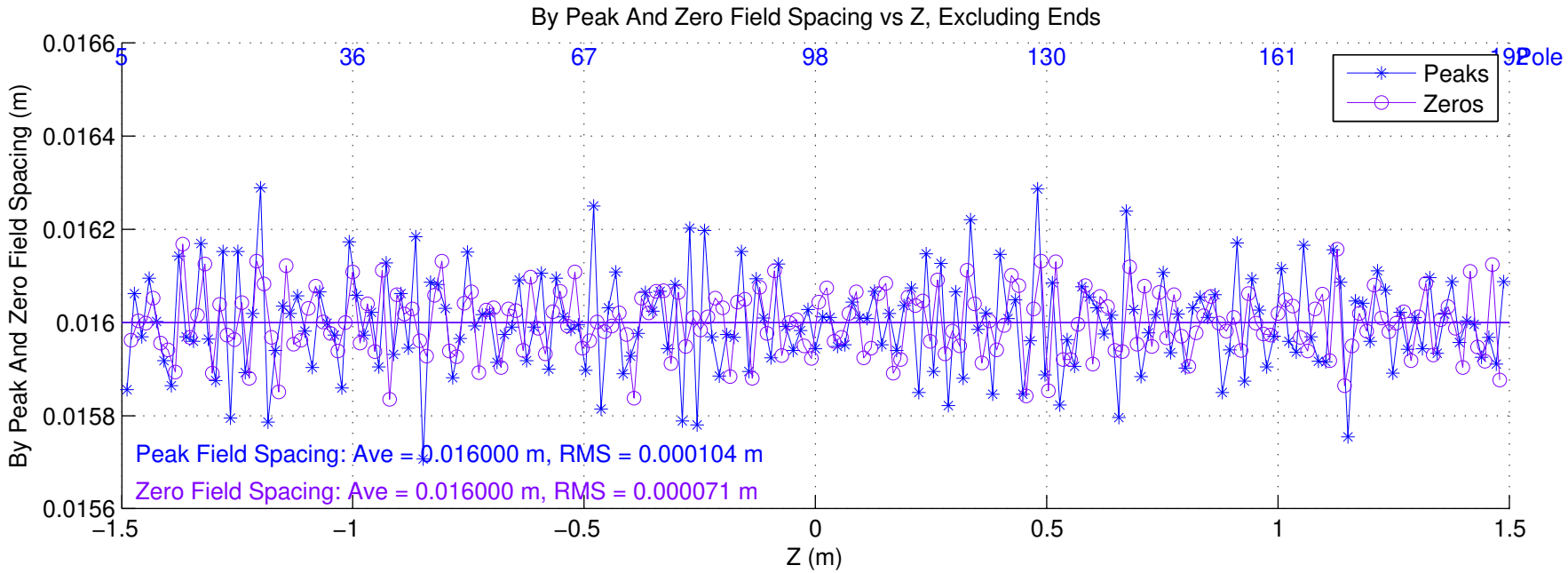

Bx vs Z With Fitted Peaks And Zeros
4
35
66
98
129
160
192
Pole
0.04
0.03
0.02
0.01
0
−0.01
−0.02
−0.03
−0.04
Bx (T)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

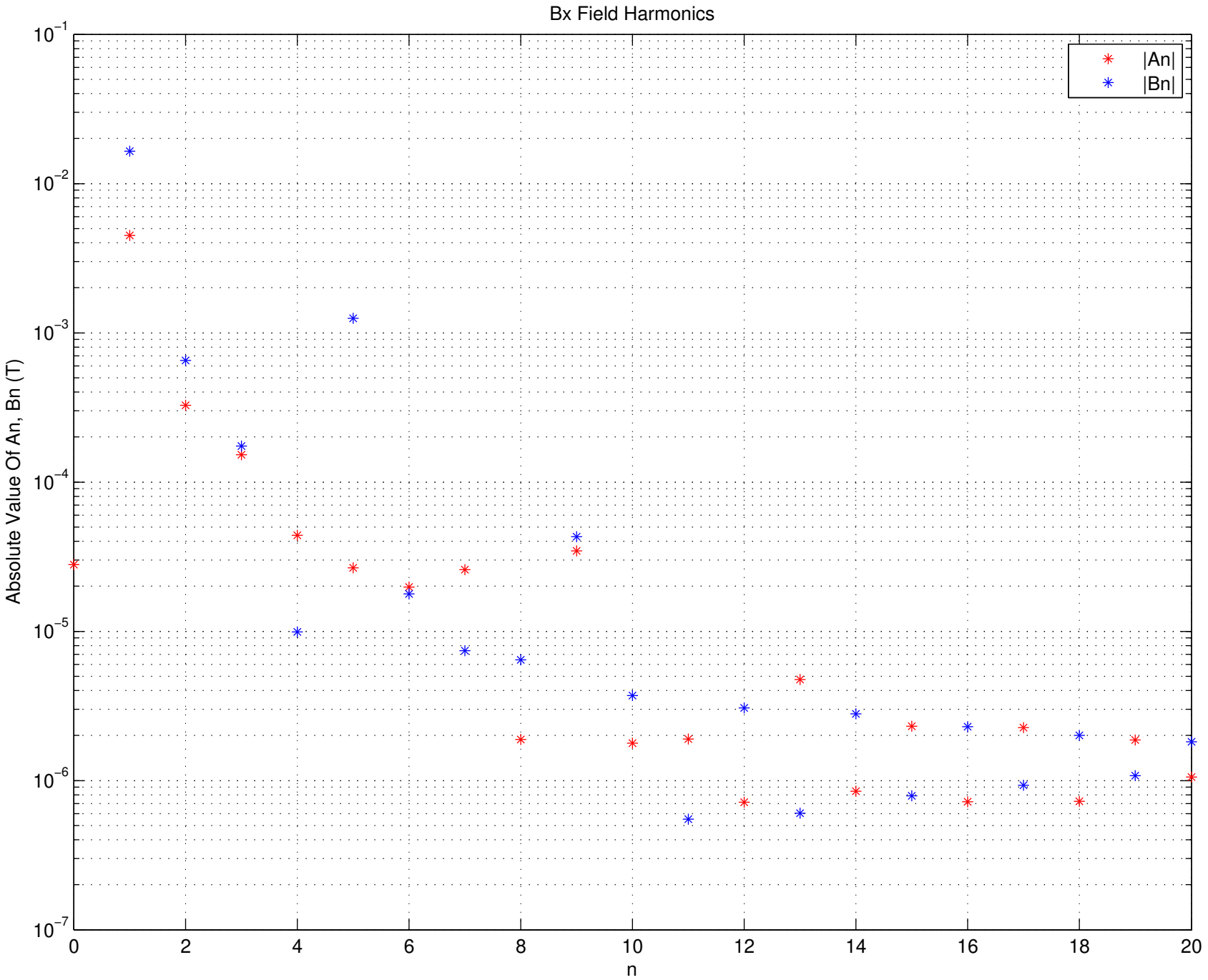

By vs Z With Fitted Peaks And Zeros
5
36
67
98
130
161
192
Pole
1
0.5
0
−0.5
−1
By (T)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

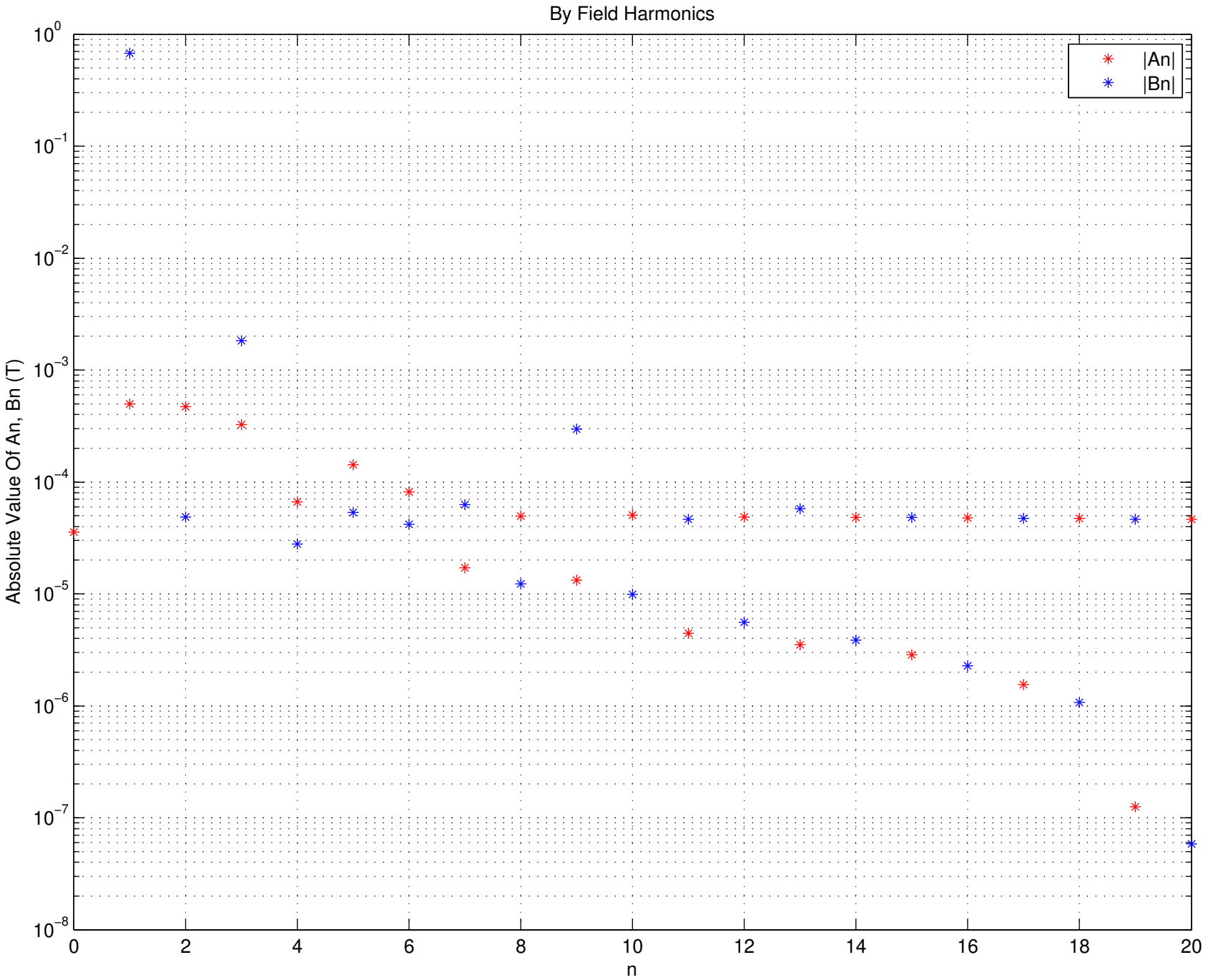

Abs(Fitted Peak Bx) vs Z, Excluding Ends
4
35
66
98
129
160
192
Pole
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Abs(Peak Bx) (T)
Peak Fields: Ave = 0.019520 T, RMS = 0.006668 T
−1.5
−1
−0.5
0
0.5
1
1.5
Z (m)

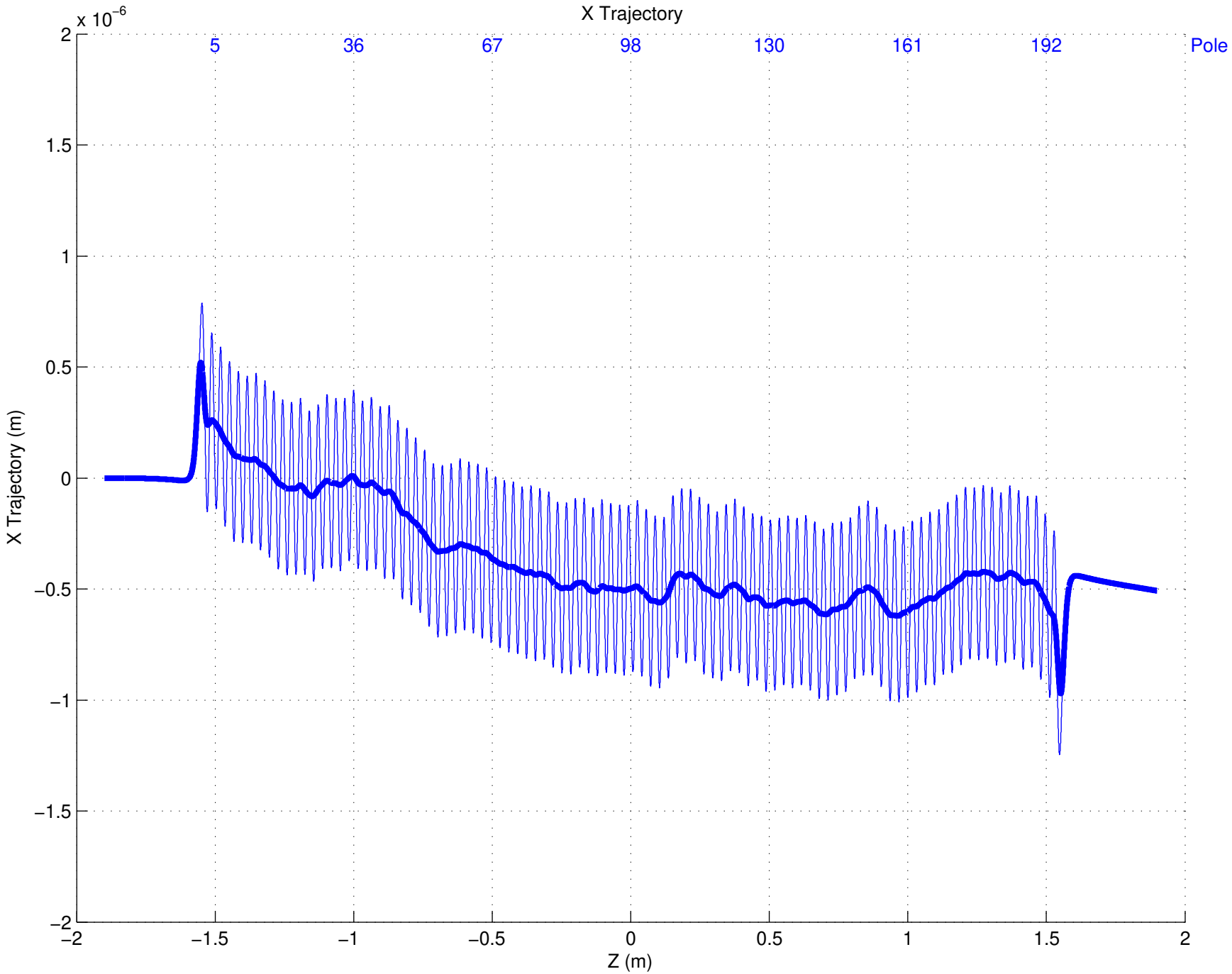

Abs(Fitted Peak By) vs Z, Excluding Ends
5
36
67
98
130
161
192
Pole
0.7
0.69
0.68
0.67
0.66
0.65
0.64
Abs(Peak By) (T)
Peak Fields: Ave = 0.674347 T, RMS = 0.008109 T
−1.5
−1
−0.5
0
0.5
1
1.5
Z (m)

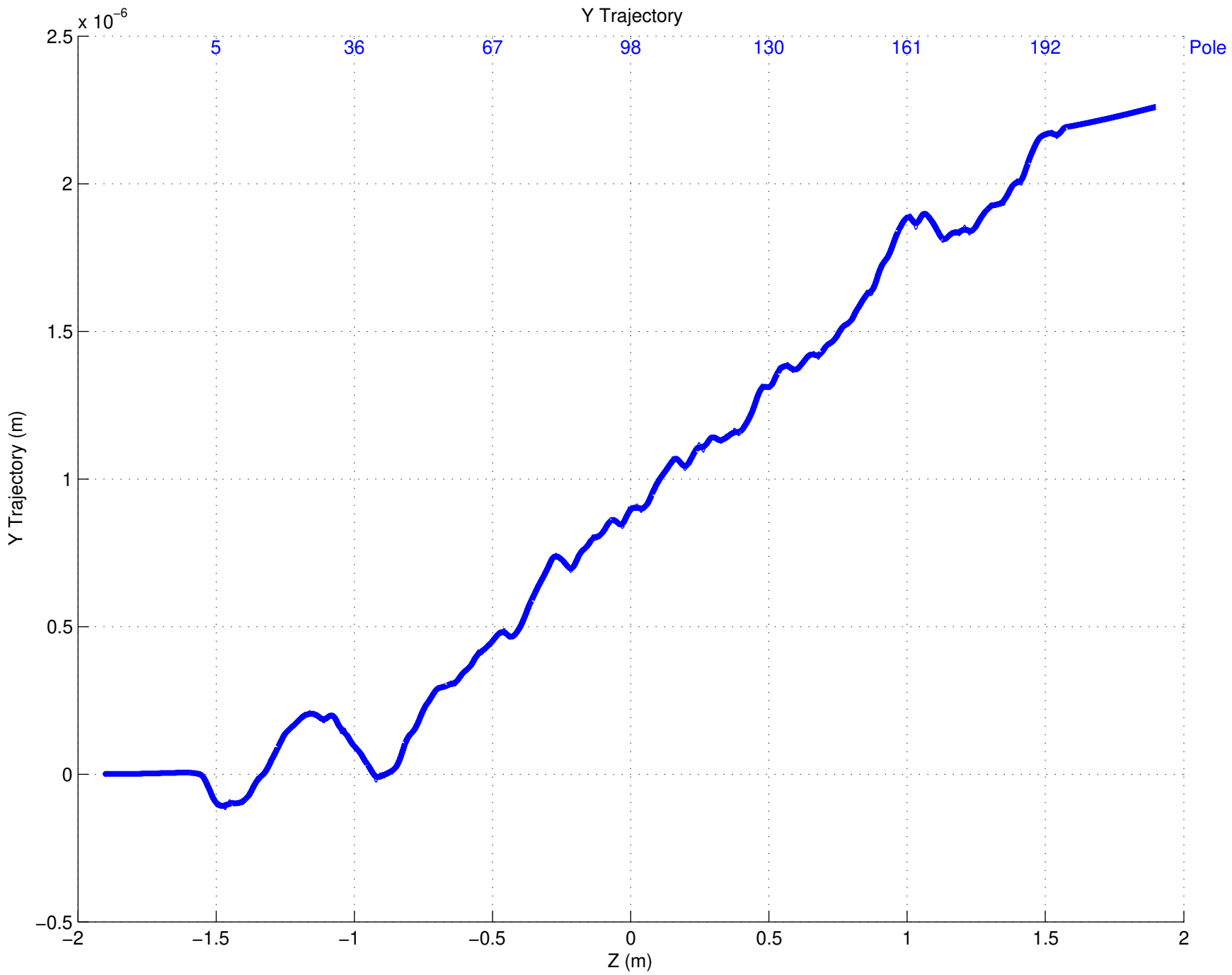

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
4
35
66
98
129
160
192
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.015945 m, RMS = 0.003610 m
Zero Field Spacing: Ave = 0.015970 m, RMS = 0.002941 m
0.03
0.025
0.02
0.015
0.01
0.005
−1.5
−1
−0.5
0
0.5
1
1.5

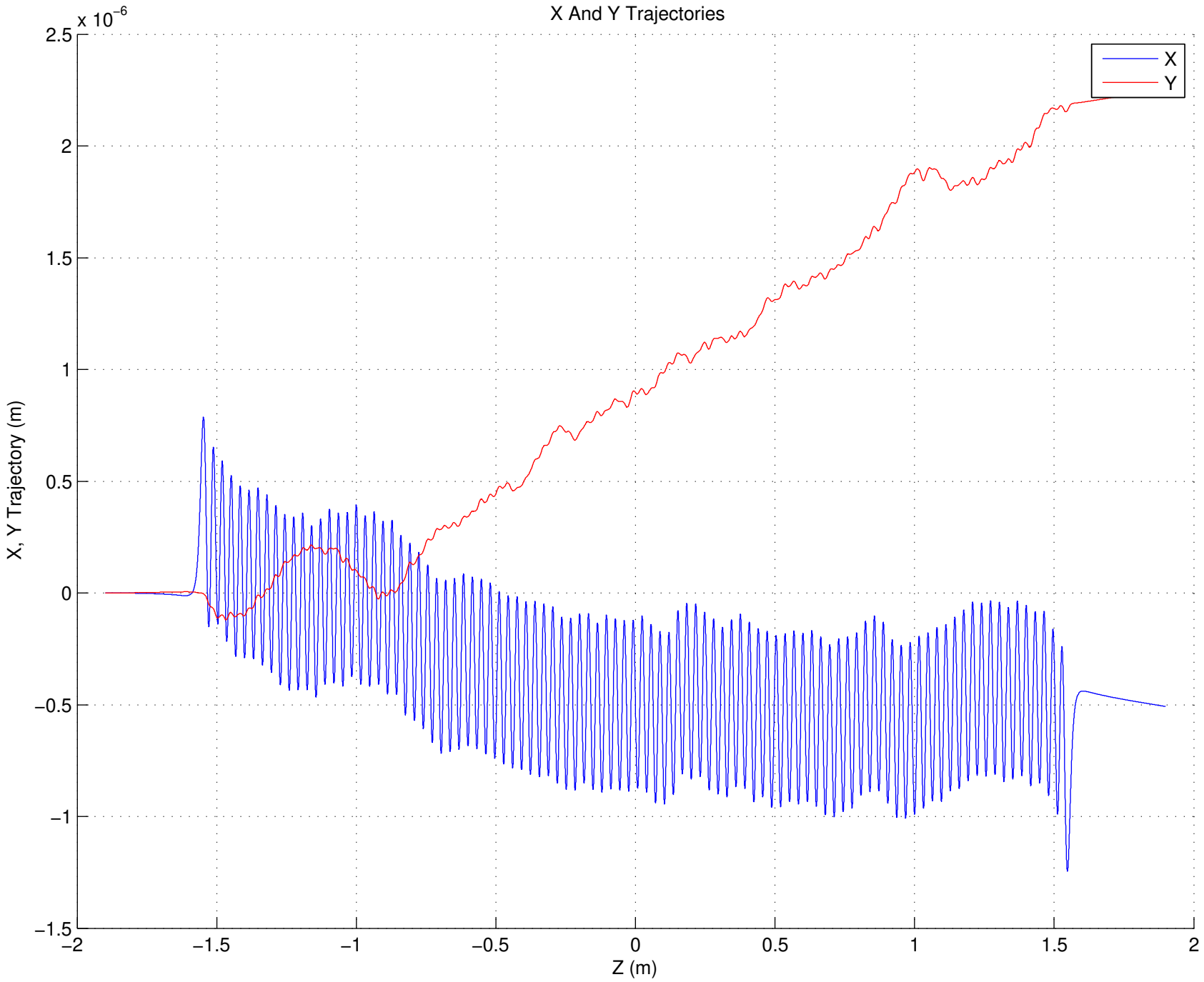

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
5
36
67
98
130
161
192
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.016000 m, RMS = 0.000104 m
Zero Field Spacing: Ave = 0.016000 m, RMS = 0.000071 m
0.0166
0.0164
0.0162
0.016
0.0158
0.0156
−1.5
−1
−0.5
0
0.5
1
1.5

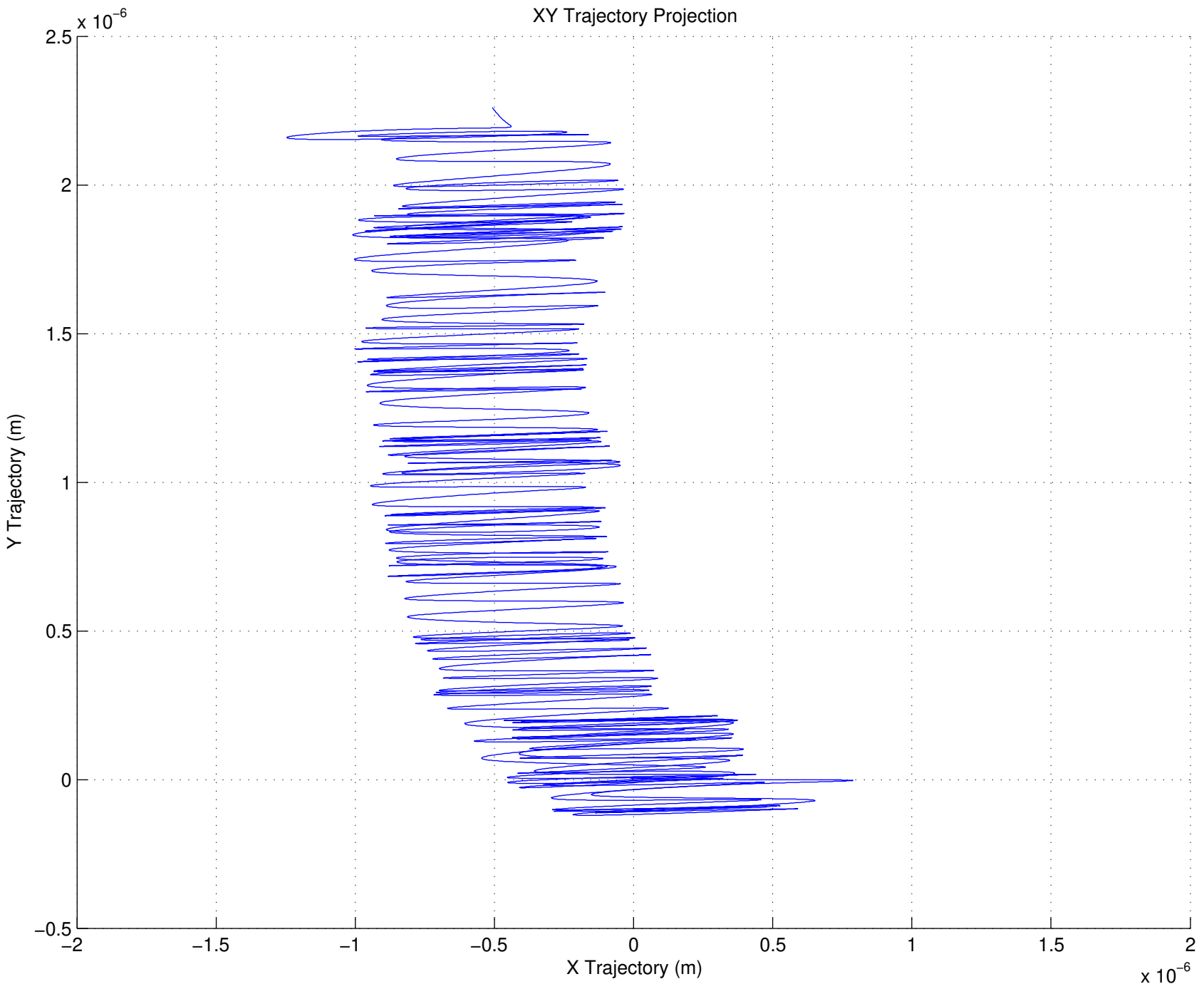

Bx Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
0
2
4
6
8
10
12
14
16
18
20

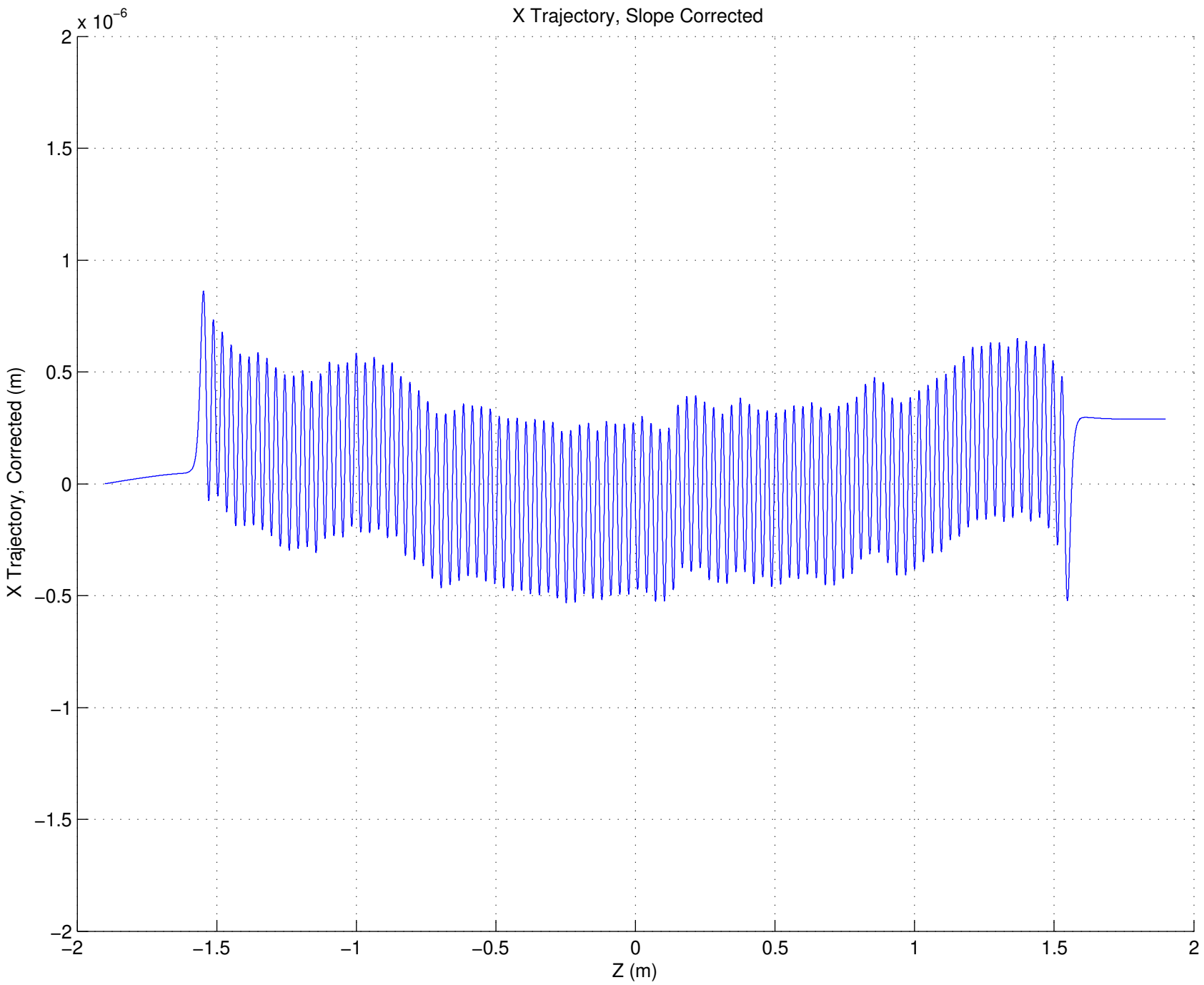

By Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{-8}
0
2
4
6
8
10
12
14
16
18
20

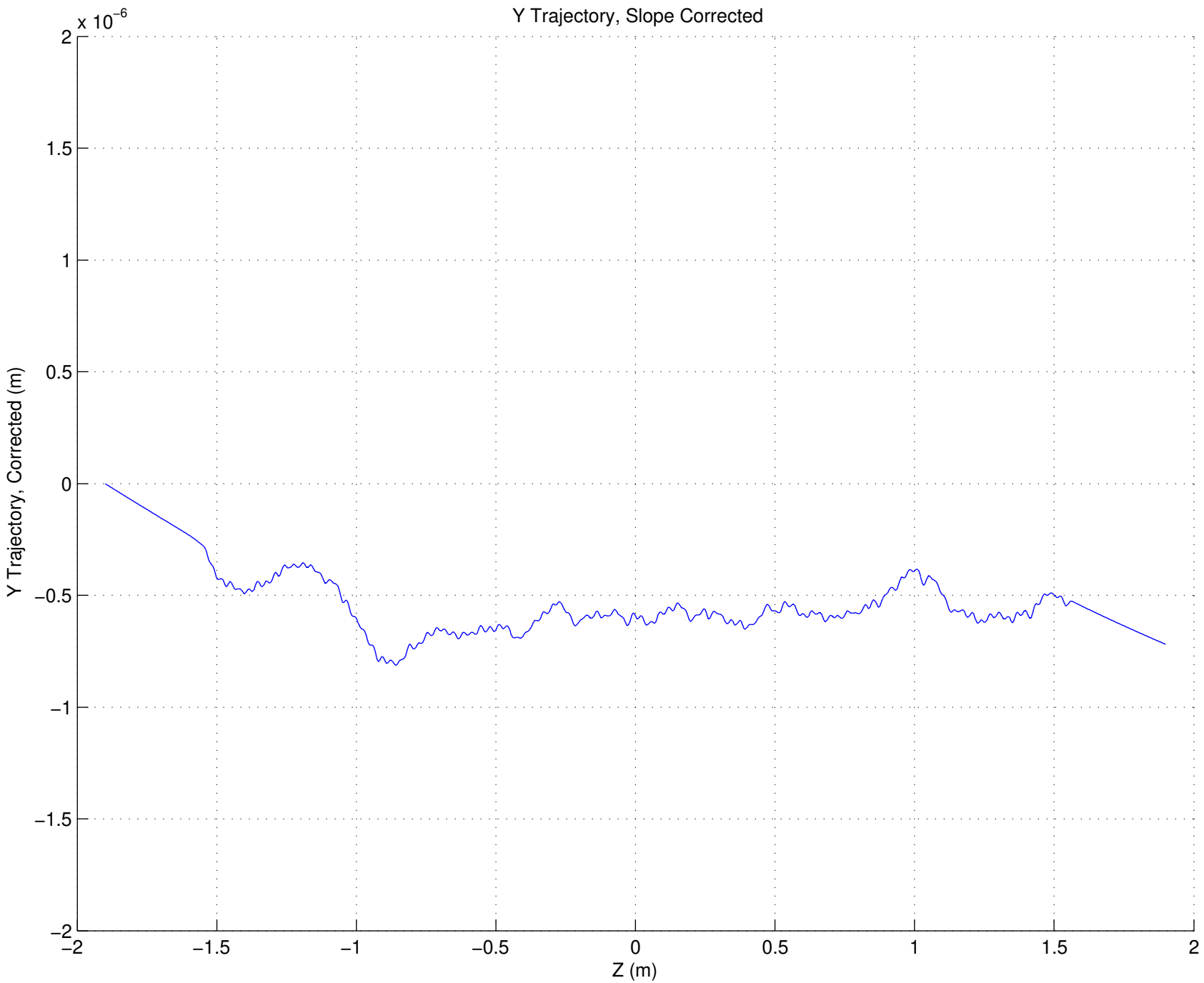

X Trajectory
x 10^-6
5
36
67
98
130
161
192
Pole
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
X Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

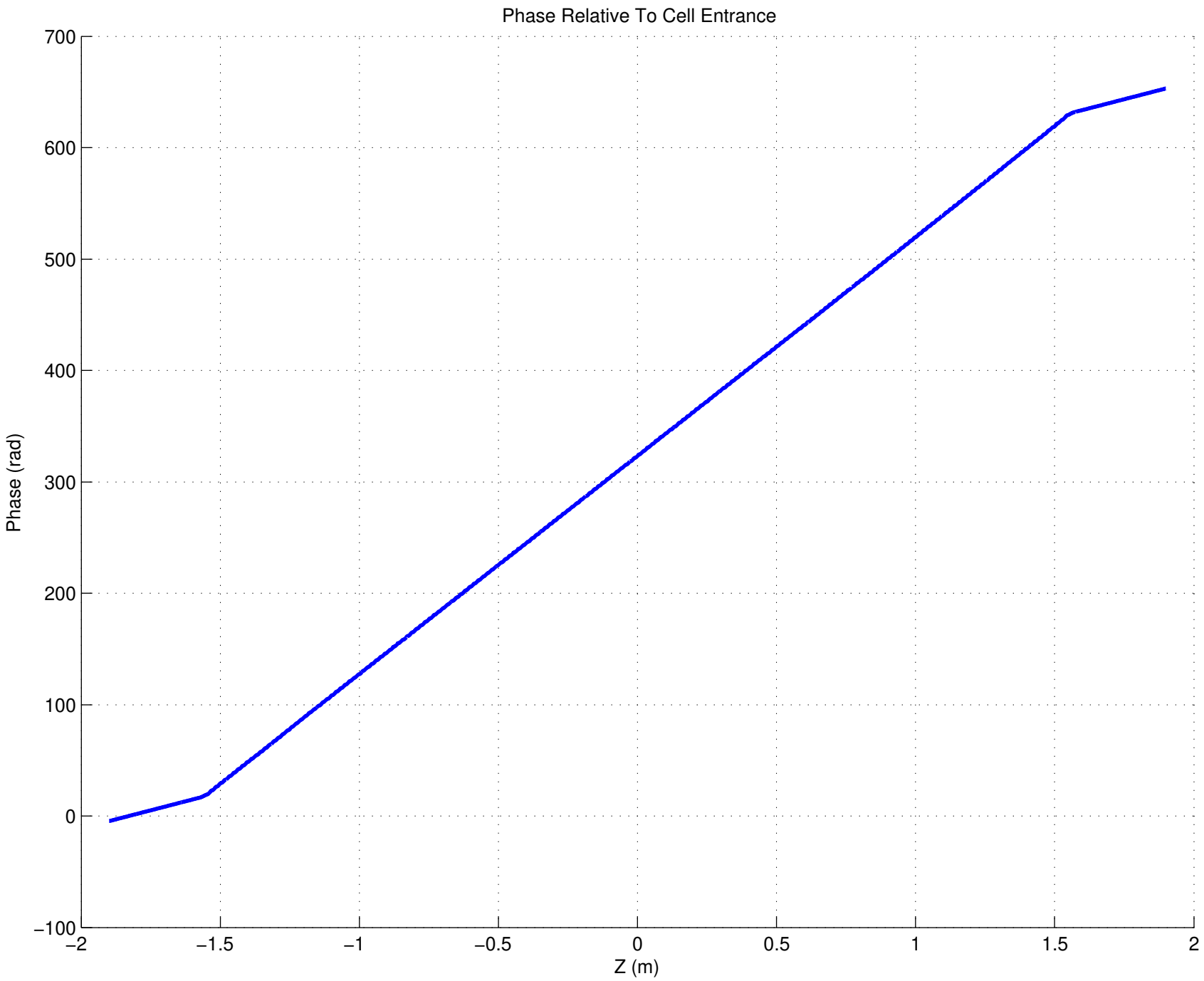

Y Trajectory
x 10^-6
5
36
67
98
130
161
192
Pole
2.5
2
1.5
1
0.5
0
−0.5
Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

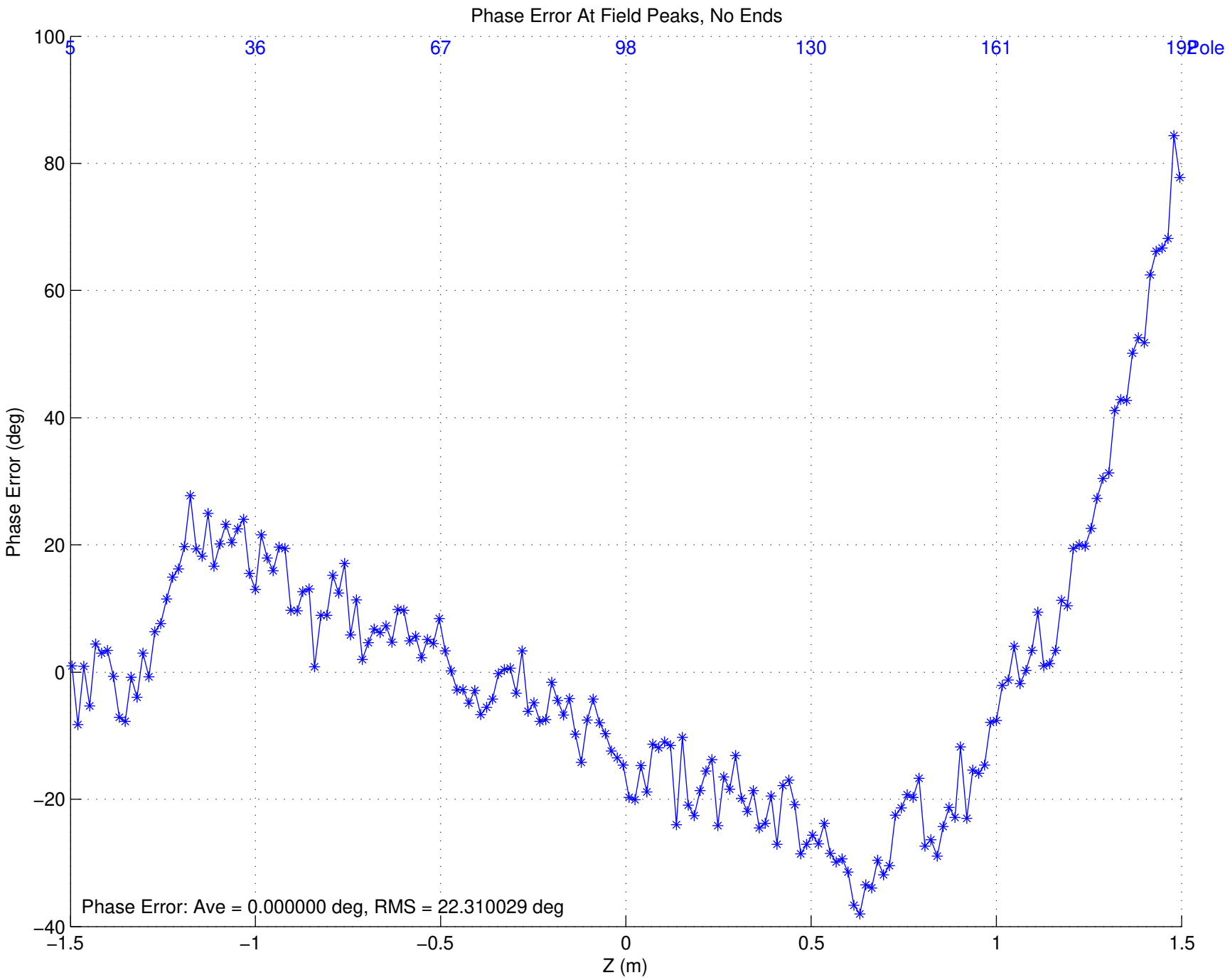

X And Y Trajectories
x 10^-6
2.5
2
1.5
1
0.5
0
−0.5
−1
−1.5
X, Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)
X
Y

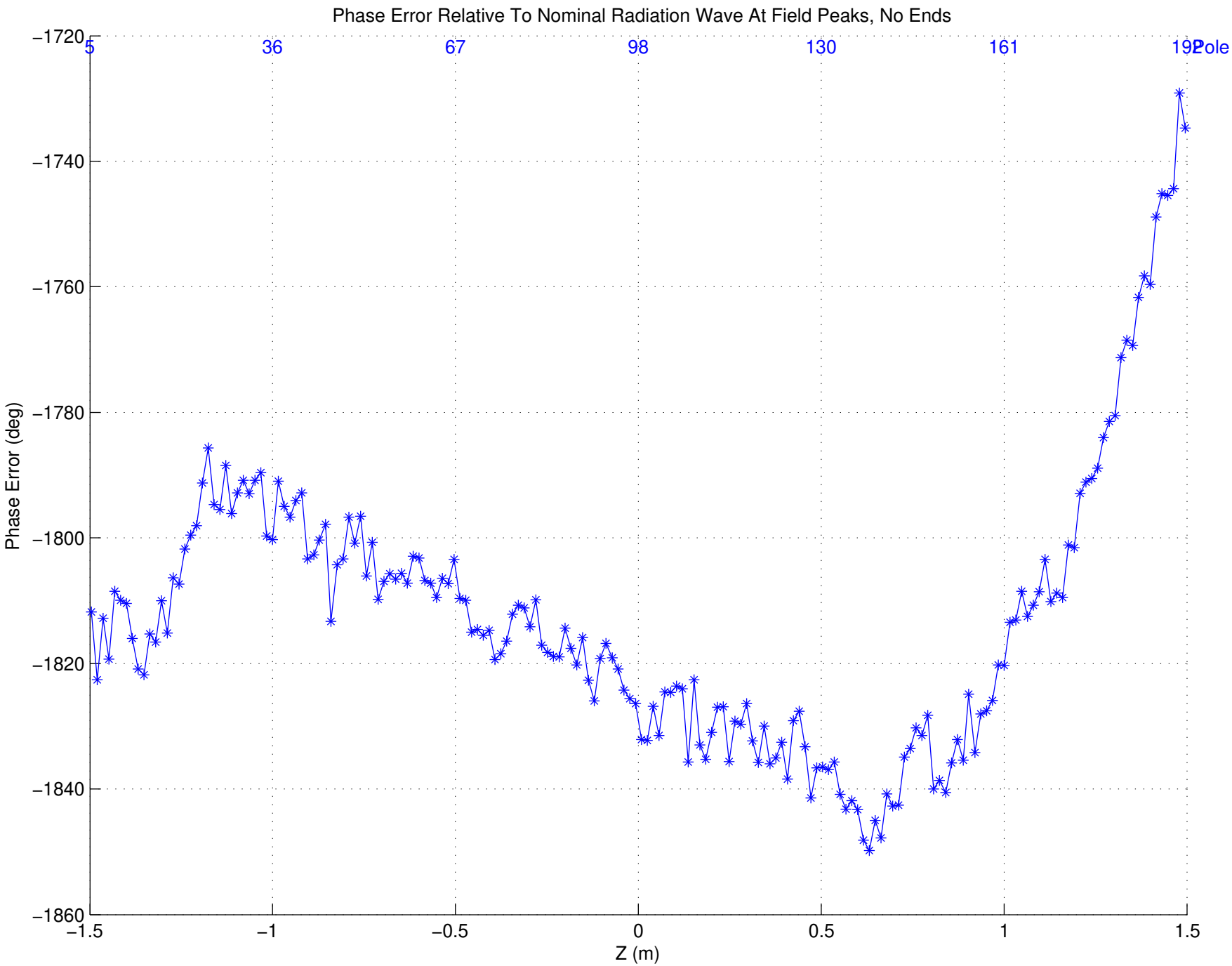

XY Trajectory Projection
x 10^-6
2.5
2
1.5
1
0.5
0
−0.5
Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
X Trajectory (m)
x 10^-6

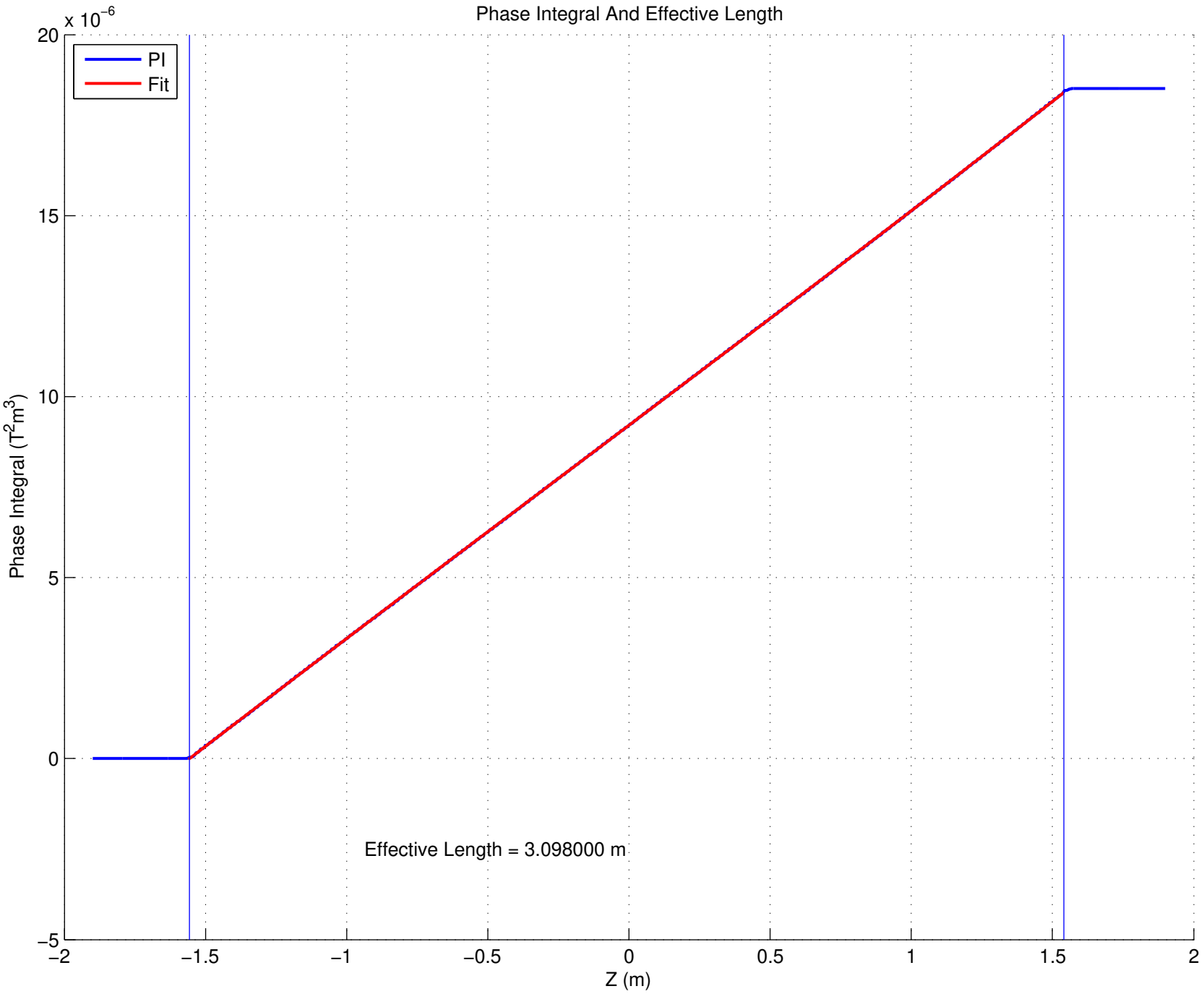

X Trajectory, Slope Corrected
x 10^-6
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
X Trajectory, Corrected (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

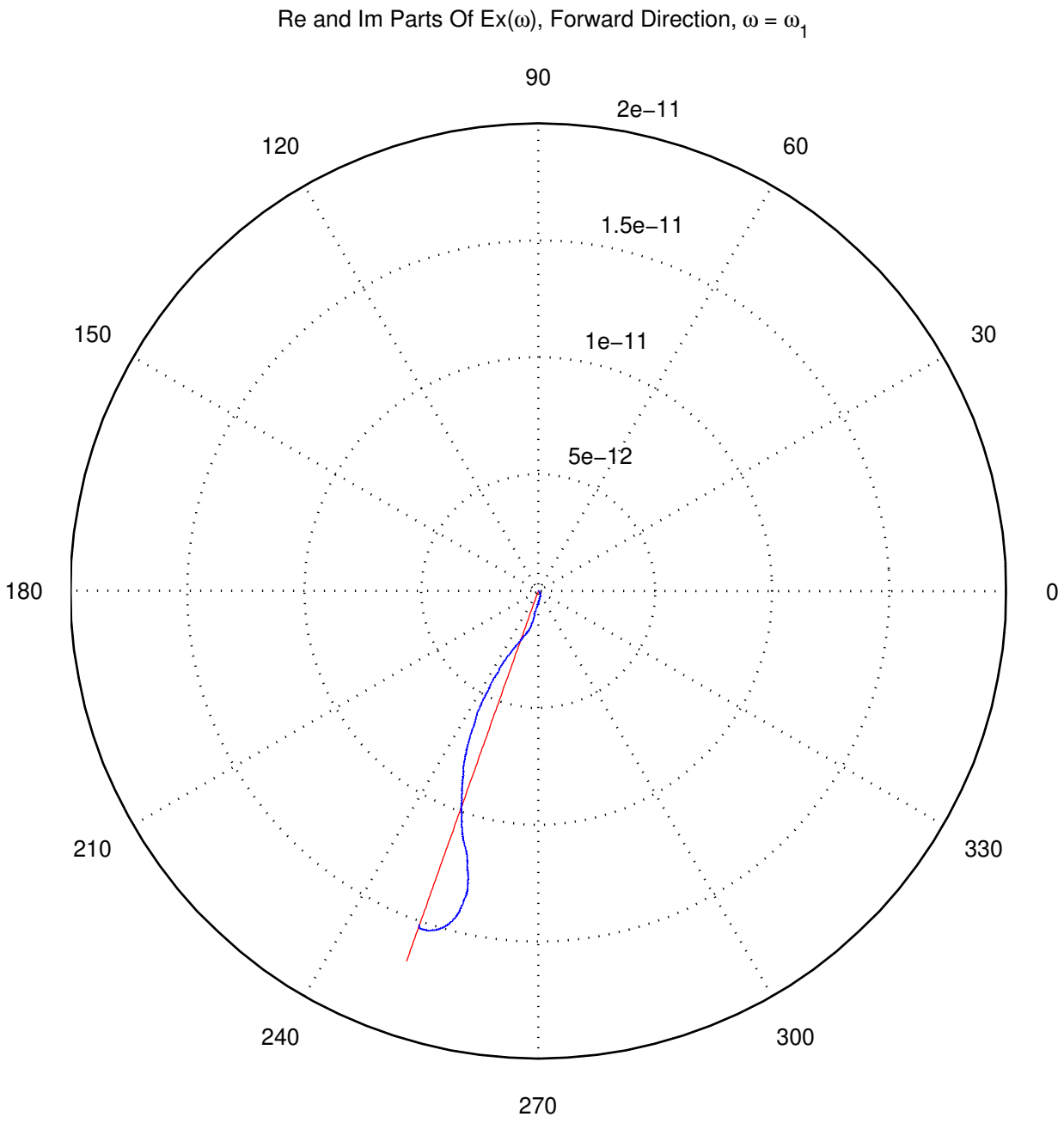

Y Trajectory, Slope Corrected
x 10^-6
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
Y Trajectory, Corrected (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

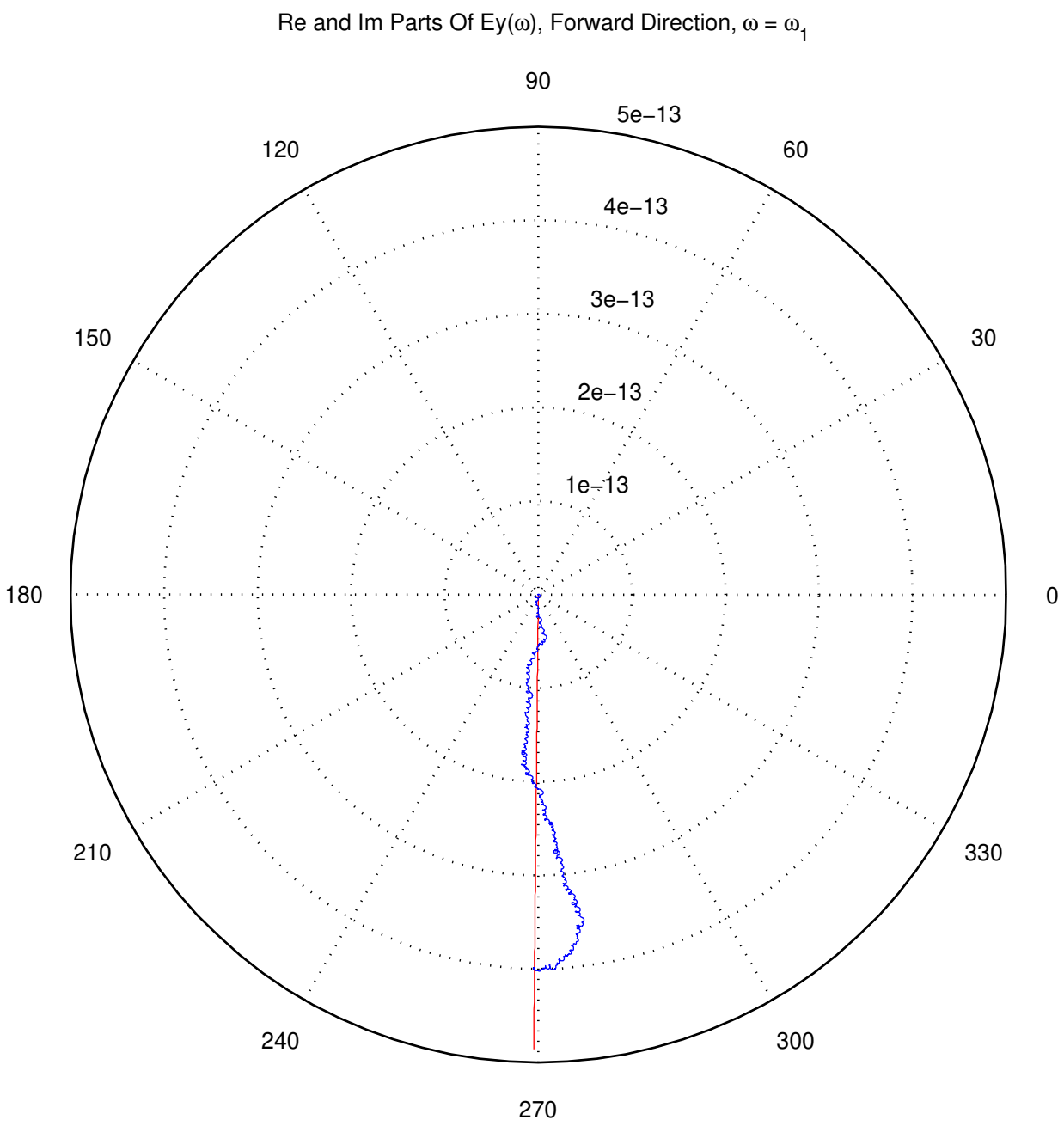

Phase Relative To Cell Entrance
Phase (rad)
700
600
500
400
300
200
100
0
−100
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

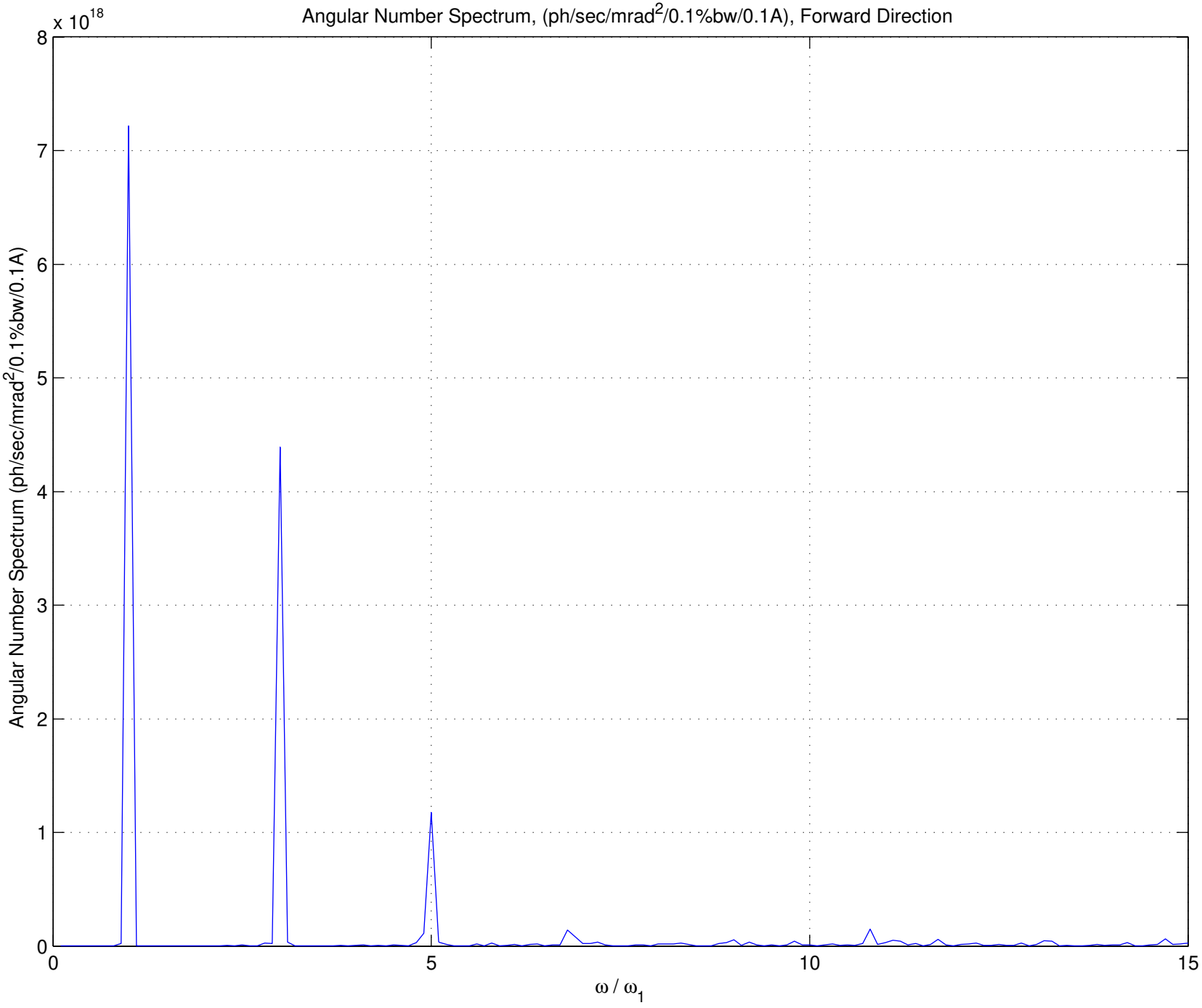

Phase Error At Field Peaks, No Ends
5
36
67
98
130
161
192
Pole
100
80
60
40
20
0
−20
−40
Phase Error (deg)
−1.5
−1
−0.5
0
0.5
1
1.5
Z (m)
Phase Error: Ave = 0.000000 deg, RMS = 22.310029 deg

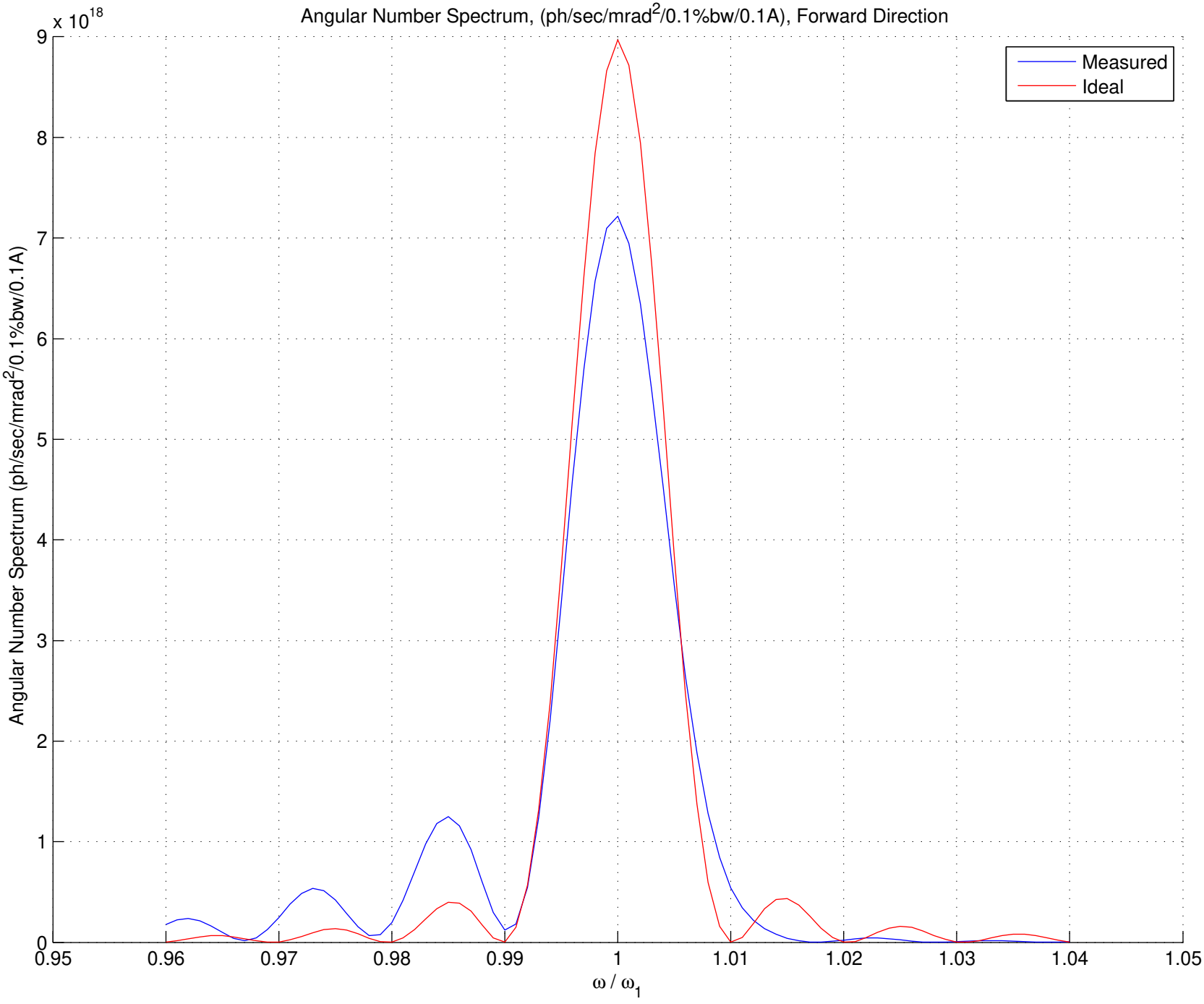

Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
5
36
67
98
130
161
192
Pole
−1720
−1740
−1760
−1780
−1800
−1820
−1840
−1860
Phase Error (deg)
−1.5
−1
−0.5
0
0.5
1
1.5
Z (m)

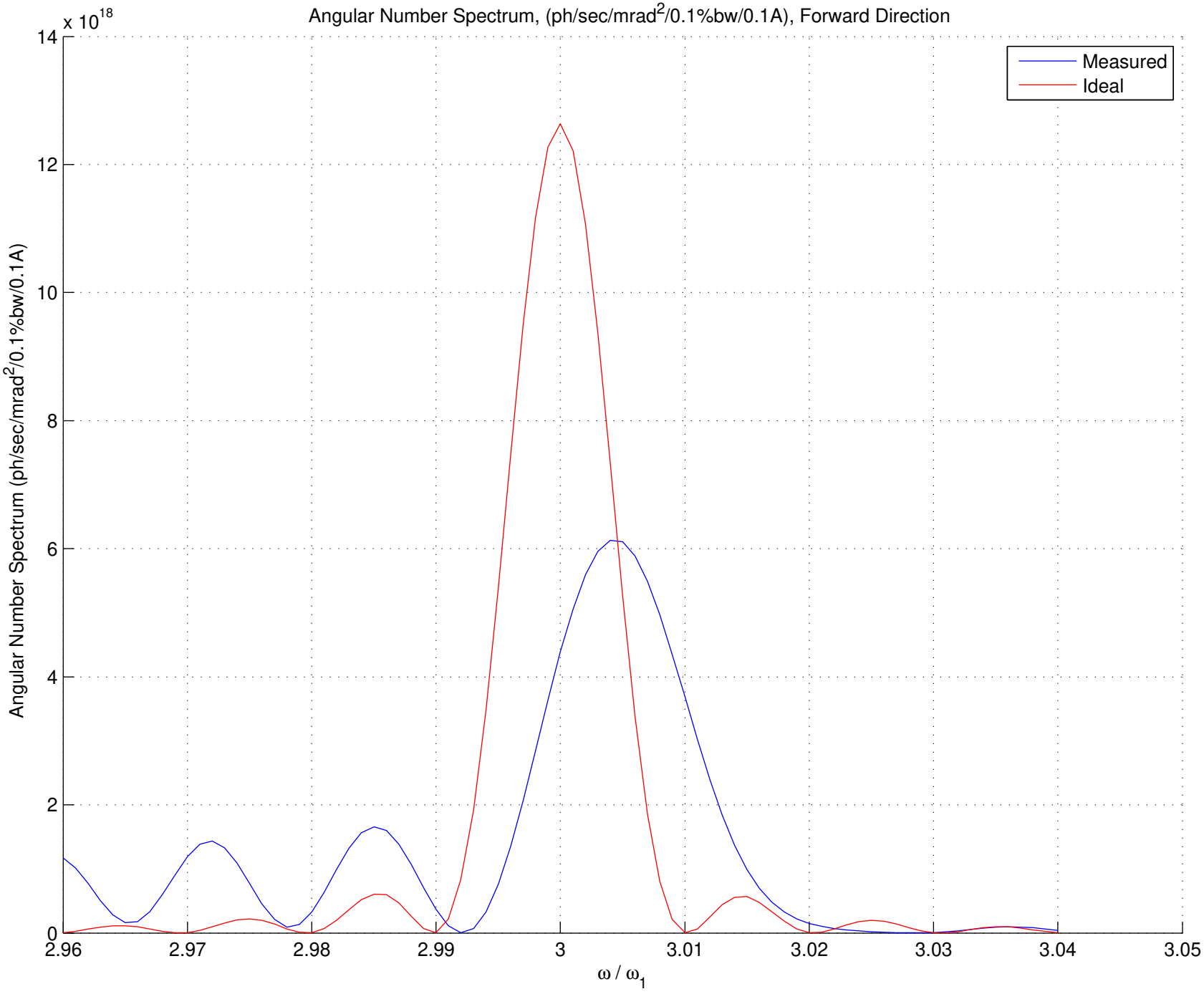

Phase Integral And Effective Length
x 10^-6
PI
Fit
20
15
10
5
0
−5
Phase Integral (T^2m^3)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)
Effective Length = 3.098000 m

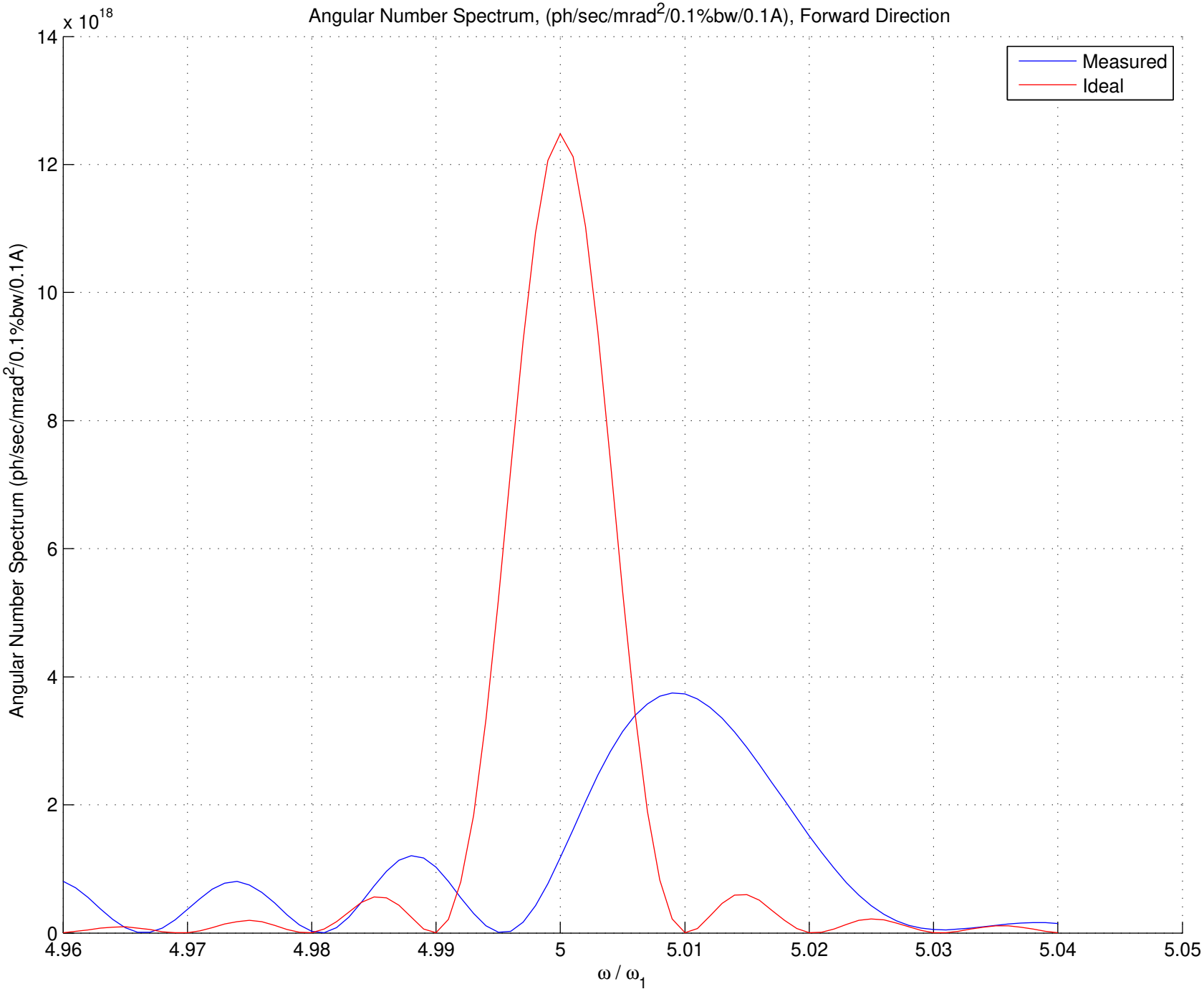

Re and Im Parts Of Ex(ω), Forward Direction, ω = ω1
90
2e−11
120
60
1.5e−11
150
30
1e−11
5e−12
180
0
210
330
240
300
270


Re and Im Parts Of Ey(ω), Forward Direction, ω = ω1
90
5e−13
120
60
4e−13
3e−13
150
30
2e−13
1e−13
180
0
210
330
240
300
270


Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
x 10^18
8
7
6
5
4
3
2
1
0
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
0
5
10
15
ω / ω1


Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
x 10^18
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
ω / ω1
Measured
Ideal
0
1
2
3
4
5
6
7
8
9
0.95
0.96
0.97
0.98
0.99
1
1.01
1.02
1.03
1.04
1.05


Angular Number Spectrum, (ph/sec/mrad^2/0.1%bw/0.1A), Forward Direction
x 10^{18}
Measured
Ideal
Angular Number Spectrum (ph/sec/mrad^2/0.1%bw/0.1A)
ω / ω_1
0
2
4
6
8
10
12
14
2.96
2.97
2.98
2.99
3
3.01
3.02
3.03
3.04
3.05


Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
x 10^18
Measured
Ideal
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
ω / ω1
0
2
4
6
8
10
12
14
4.96
4.97
4.98
4.99
5
5.01
5.02
5.03
5.04
5.05