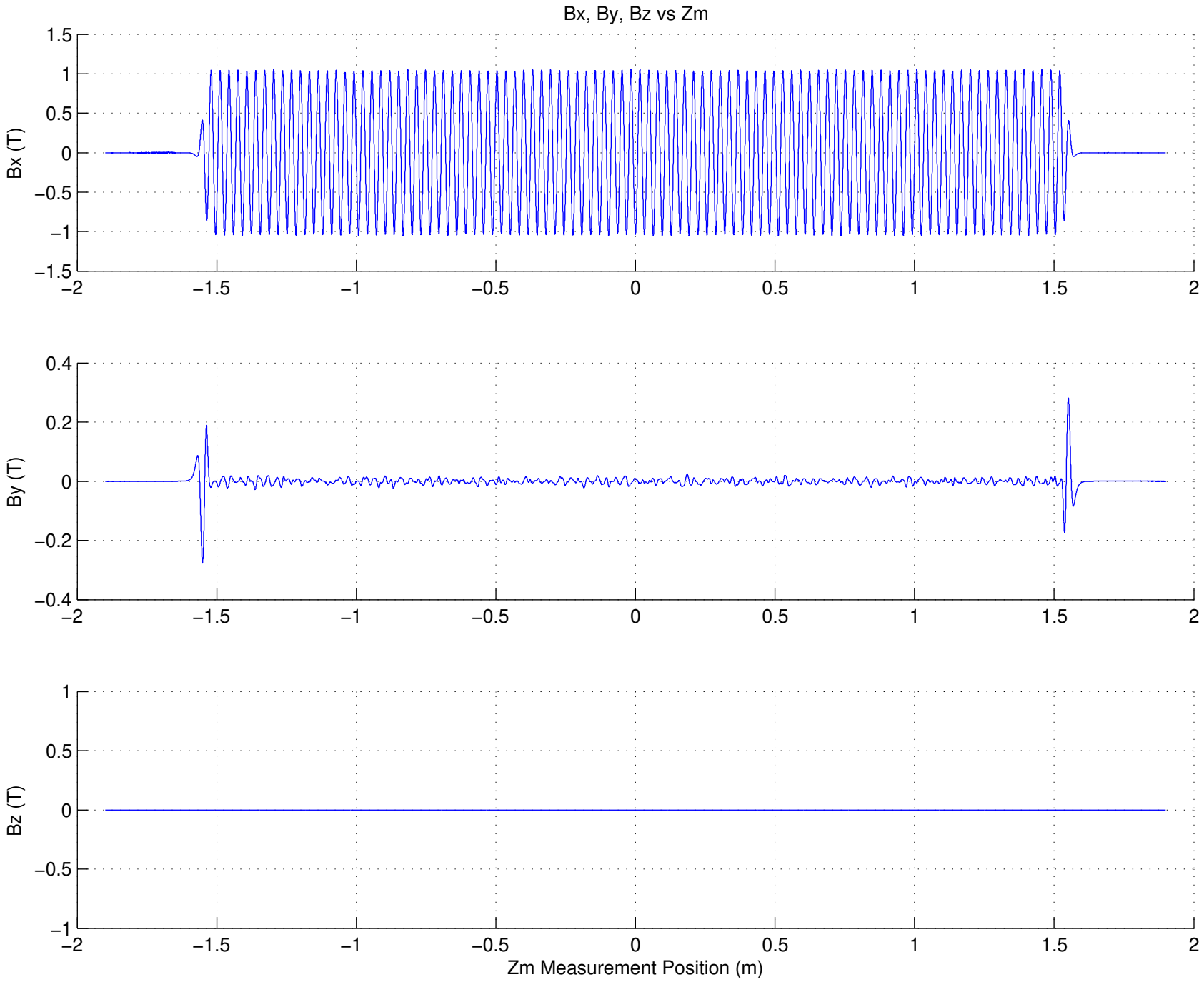
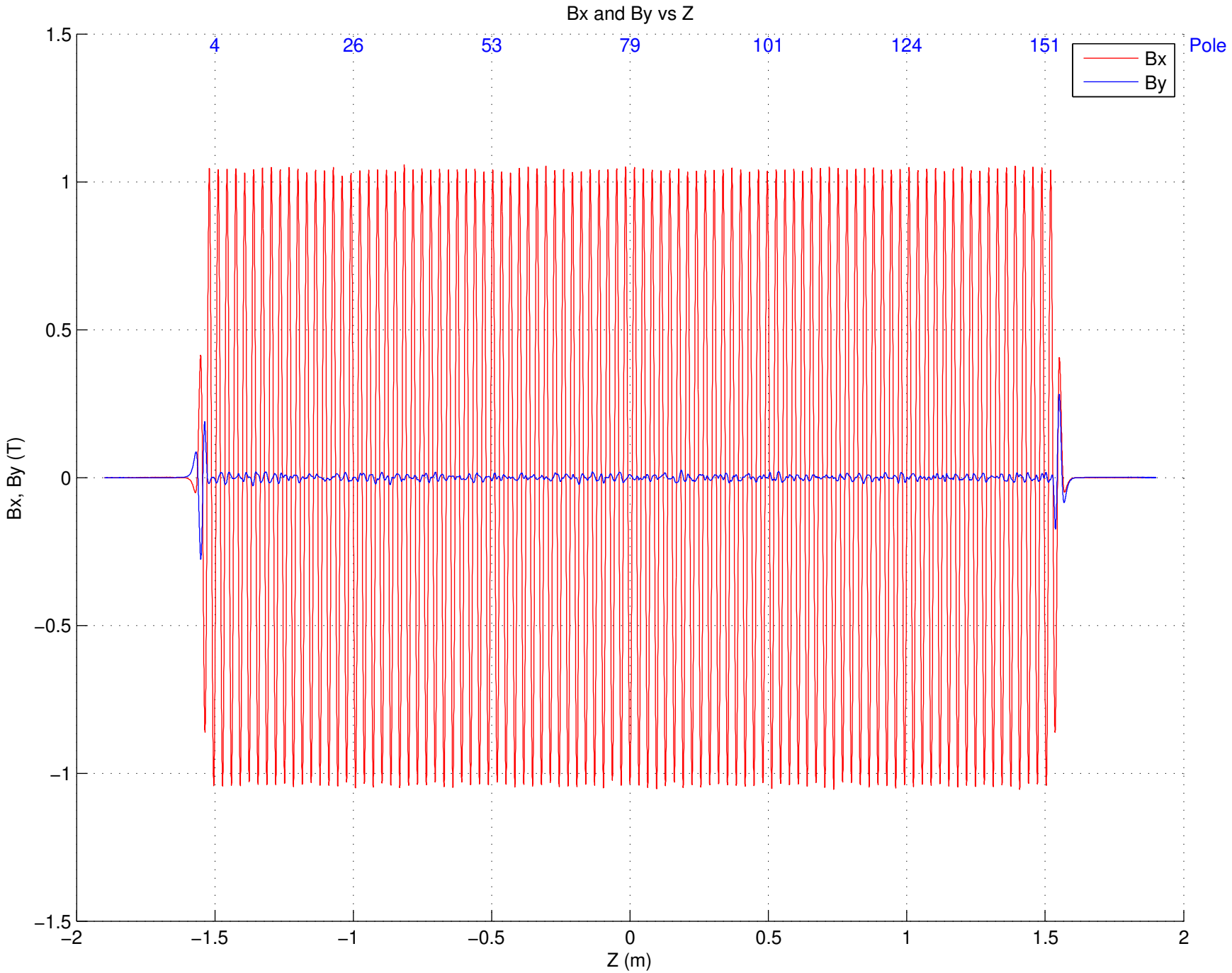
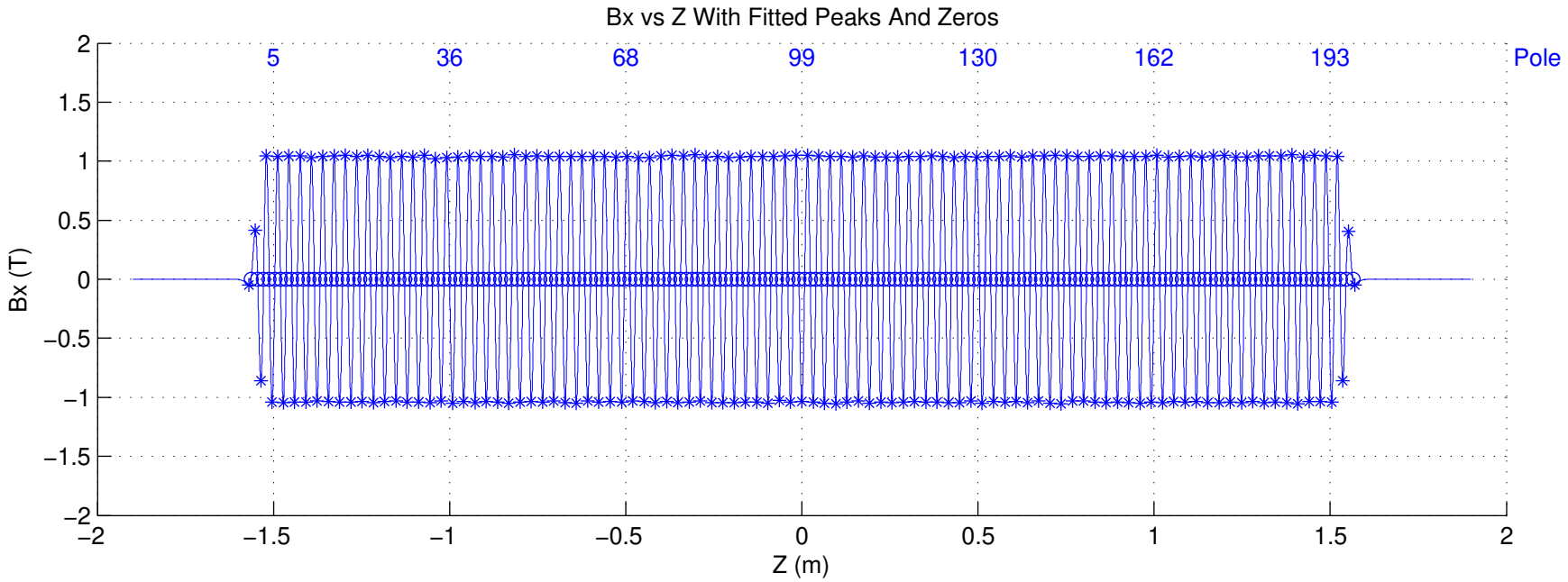
SLAC Magnetic Measurements

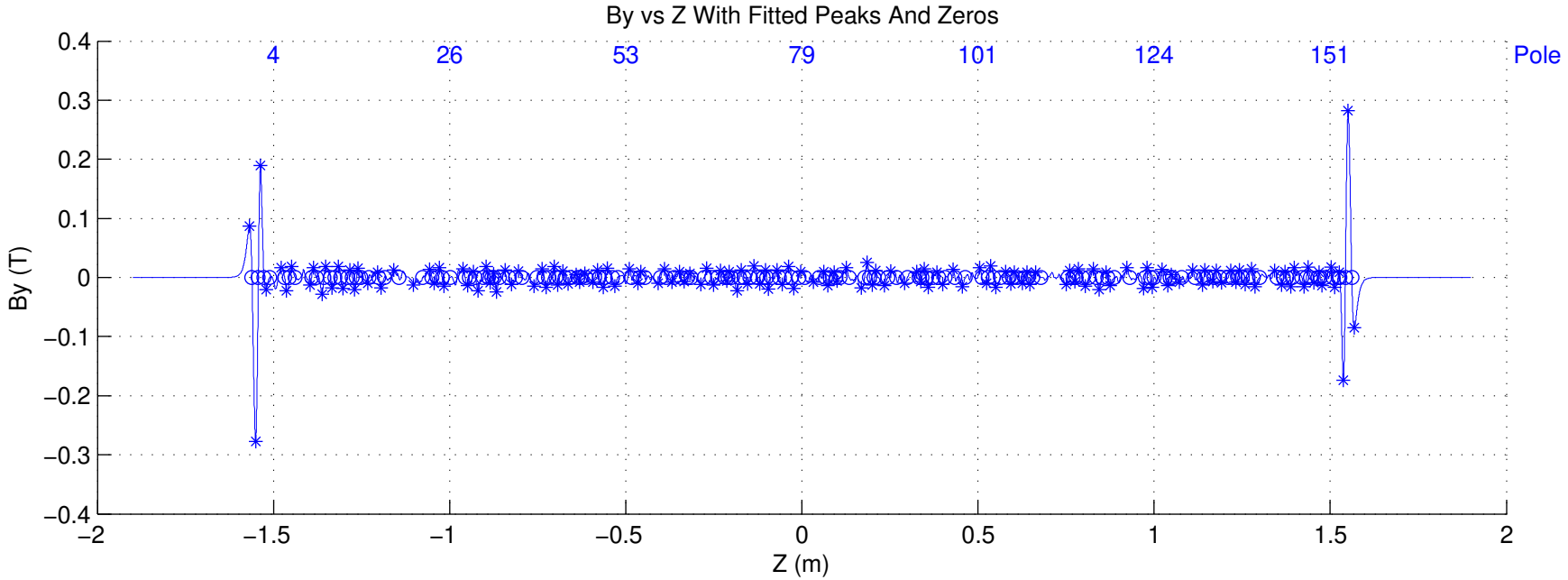
EPU Analysis
−−−−−−−−−−−

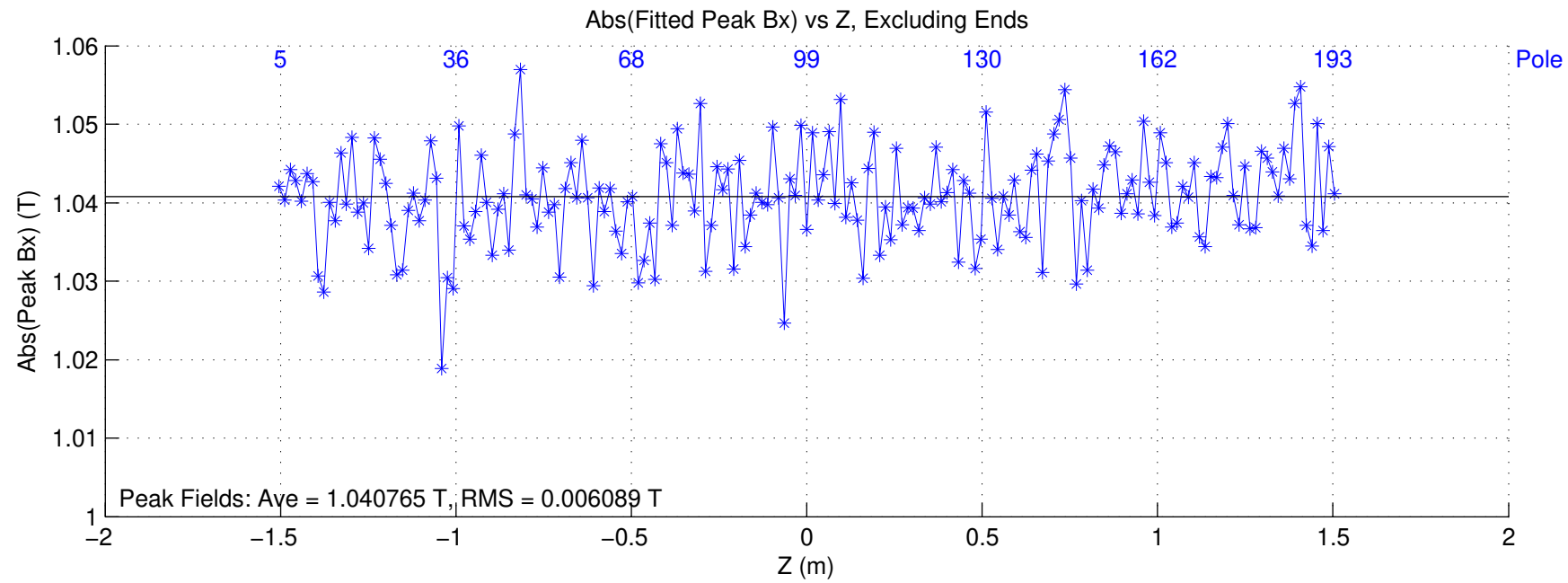
Parameters:
INPUT−FILE−DIR =V:\MET\MagServe\MagData\DELTA\Superpose Quadrants\LPHMF\KR090C
INPUT−FILE−NAME =superpose−quadrants.dat
INPUT−FILE−TYPE =ZBXYZH
CORR−REQUIRED =0
GAMMA =26671.59
NOM−LAMBDA−U =0
NOM−K−VALUE =0
NOM−LAMBDA−R =0
NUM−POLES =196
NUM−END−POLES =4
CELL−LENGTH =3.656

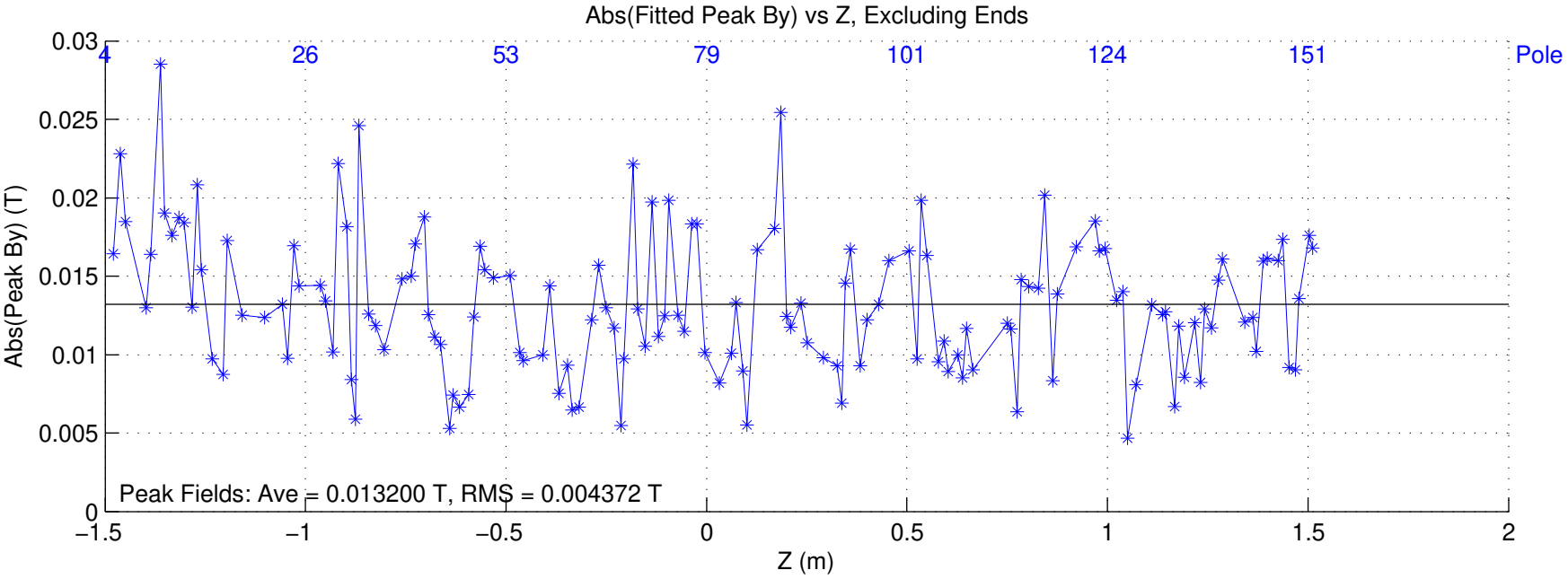

Bx, By, Bz vs Zm
Bx (T)
By (T)
Bz (T)
Zm Measurement Position (m)
1.5
1
0.5
0
−0.5
−1
−1.5
0.4
0.2
−0.2
−0.4
−2
1.5
2

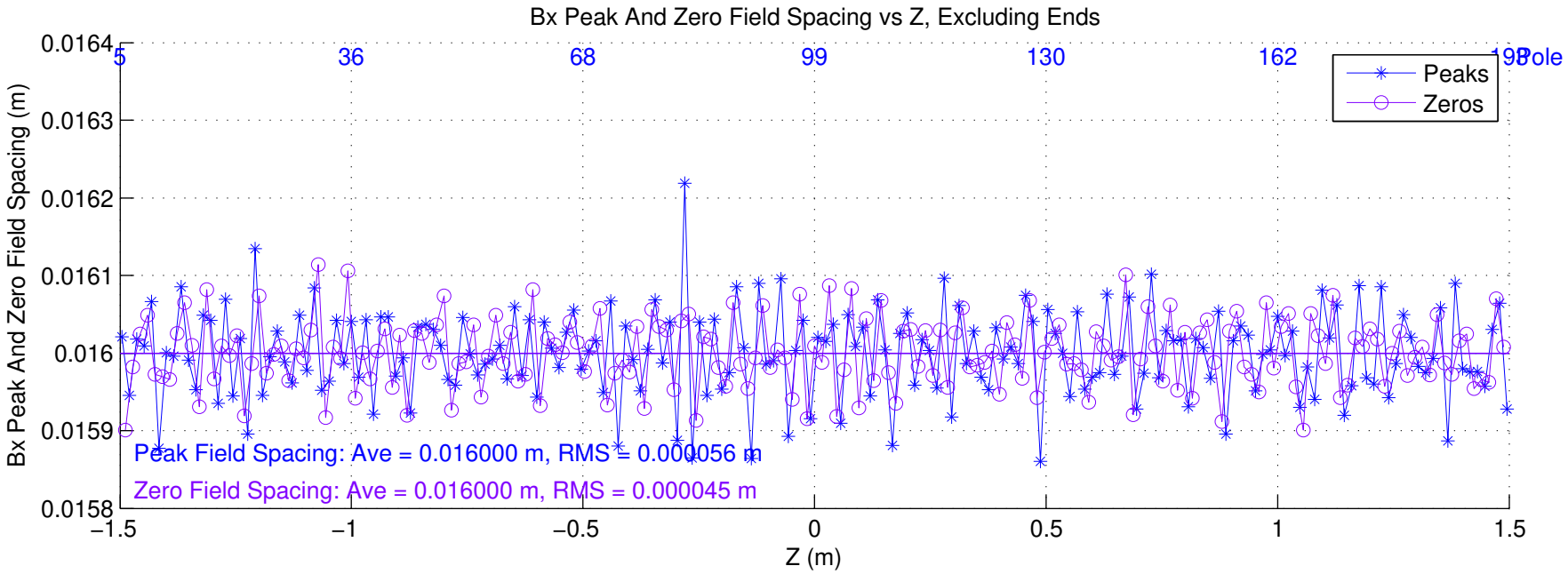

Bx and By vs Z
4
26
53
79
101
124
151
Pole
Bx
By
1.5
1
0.5
0
−0.5
−1
−1.5
Bx, By (T)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

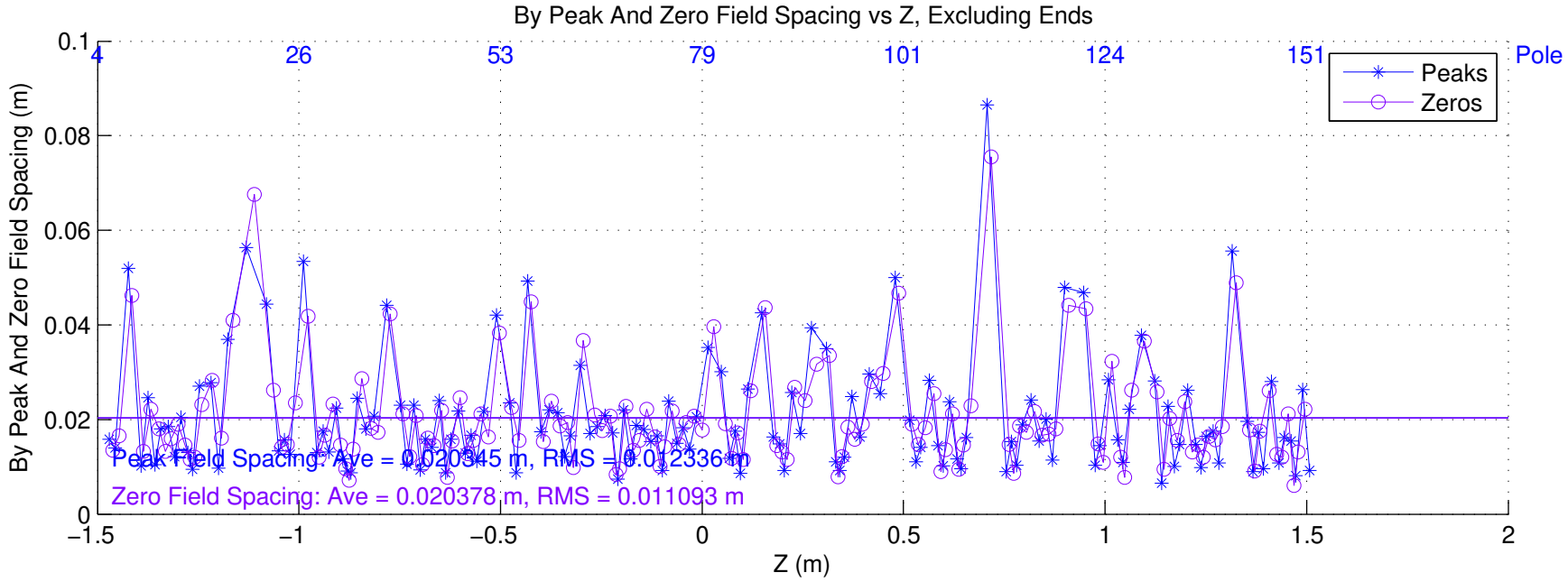

Bx vs Z With Fitted Peaks And Zeros
5
36
68
99
130
162
193
Pole
Bx (T)
Z (m)

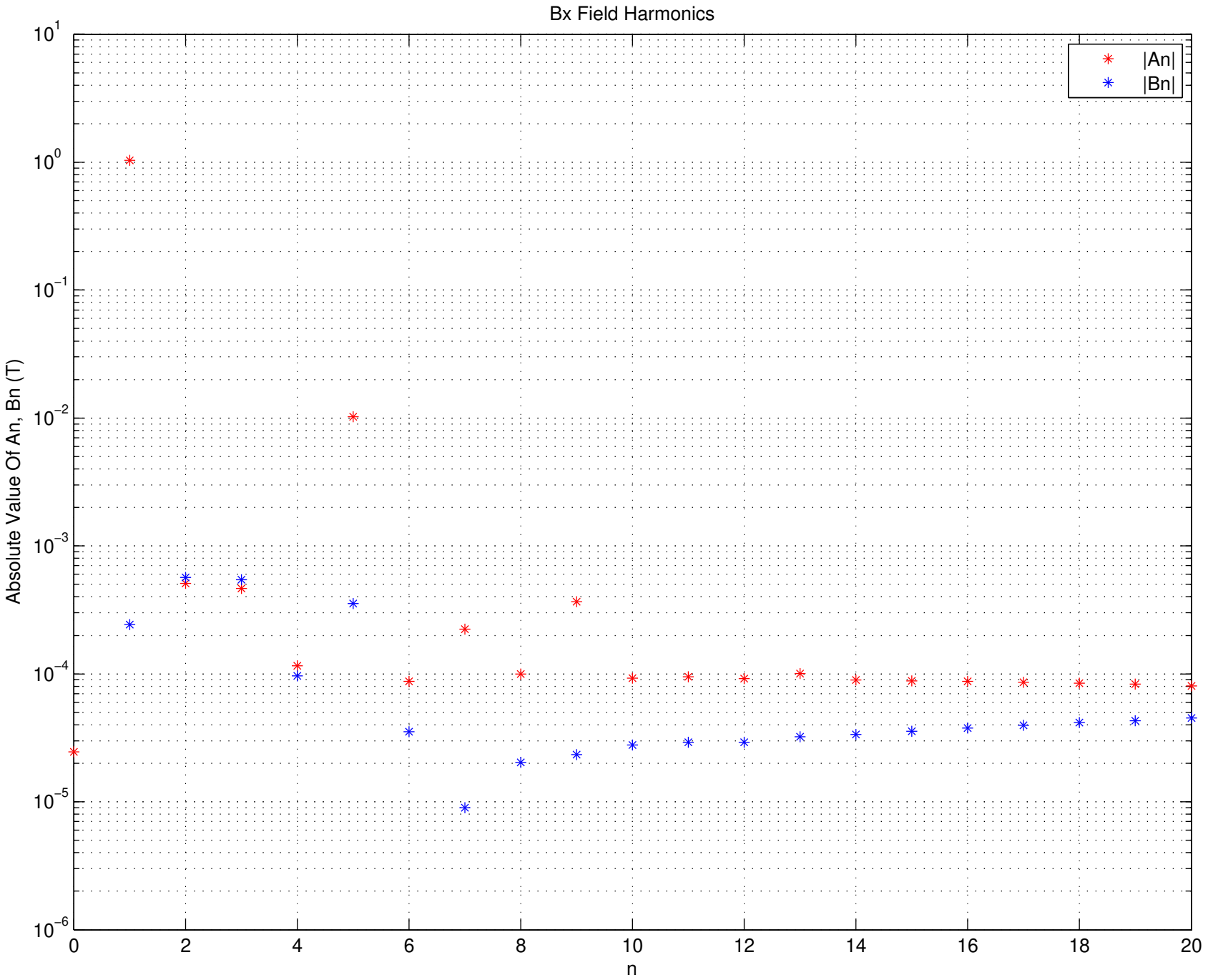

By vs Z With Fitted Peaks And Zeros
4
26
53
79
101
124
151
Pole
By (T)
Z (m)

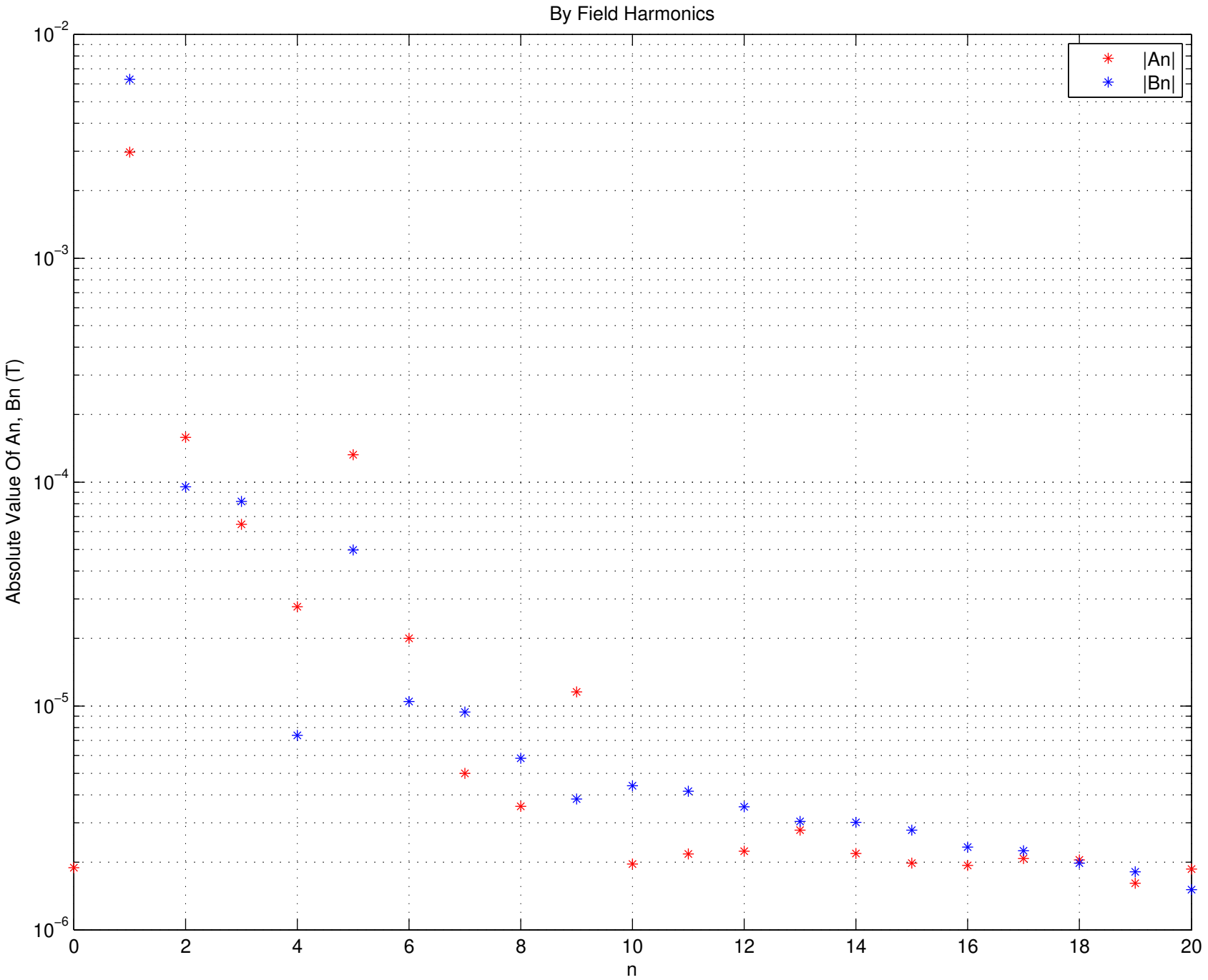

Abs(Fitted Peak Bx) vs Z, Excluding Ends
5
36
68
99
130
162
193
Pole
1.06
1.05
1.04
1.03
1.02
1.01
1
Abs(Peak Bx) (T)
Peak Fields: Ave = 1.040765 T, RMS = 0.006089 T
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

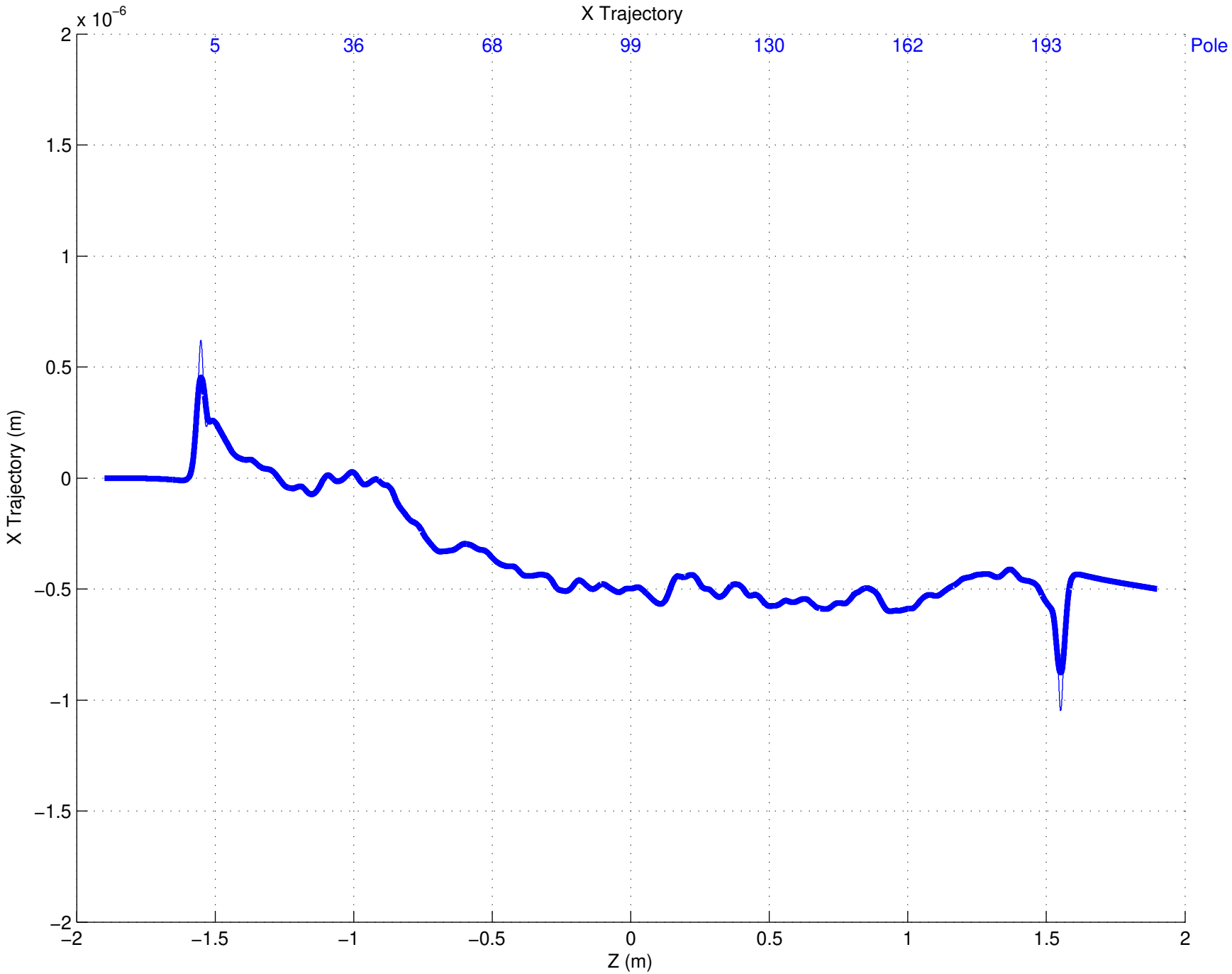

Abs(Fitted Peak By) vs Z, Excluding Ends
4
26
53
79
101
124
151
Pole
0.03
0.025
0.02
0.015
0.01
0.005
0
Abs(Peak By) (T)
Peak Fields: Ave = 0.013200 T, RMS = 0.004372 T
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

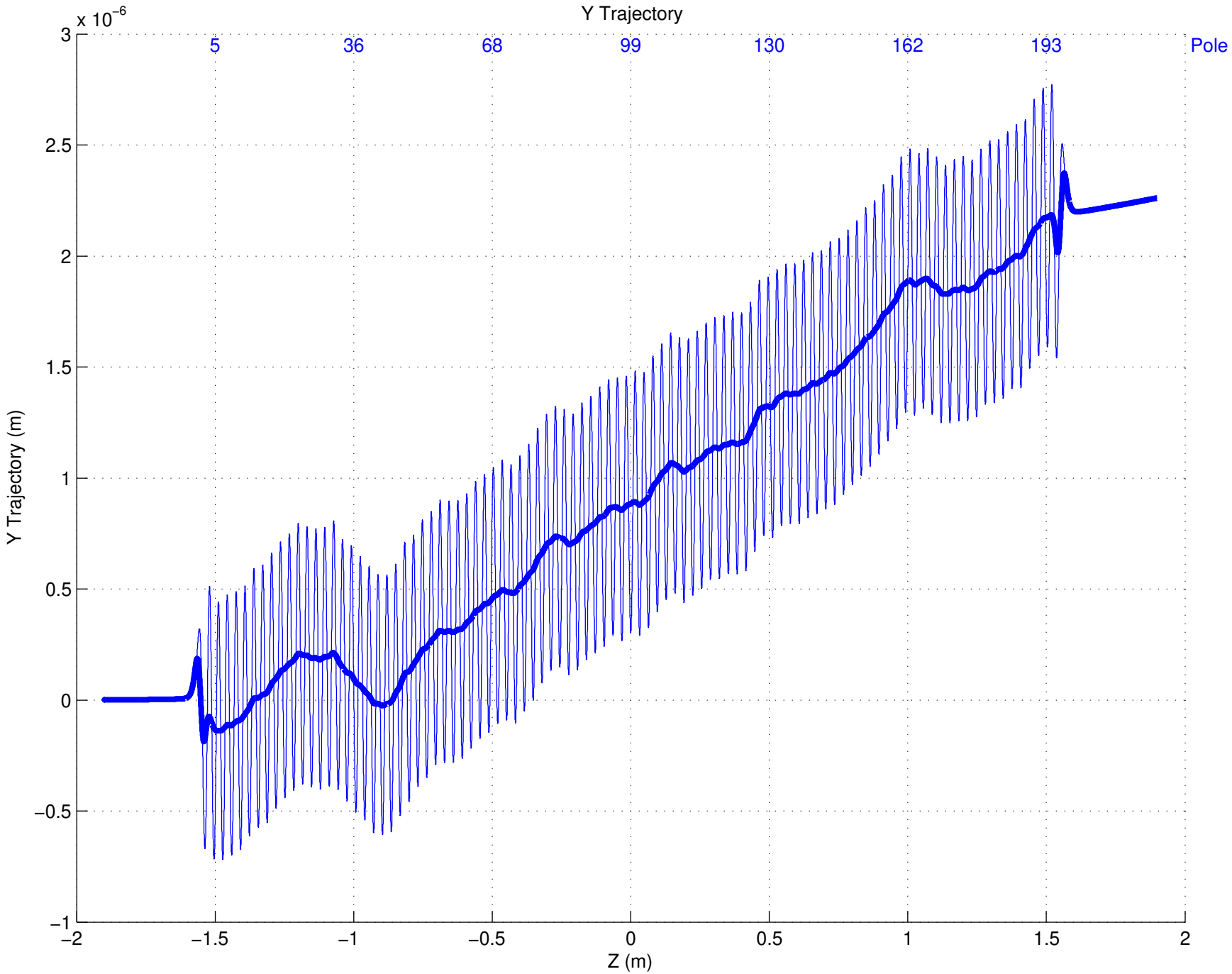

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Peaks
Zeros
Pole
Peak Field Spacing: Ave = 0.016000 m, RMS = 0.000056 m
Zero Field Spacing: Ave = 0.016000 m, RMS = 0.000045 m

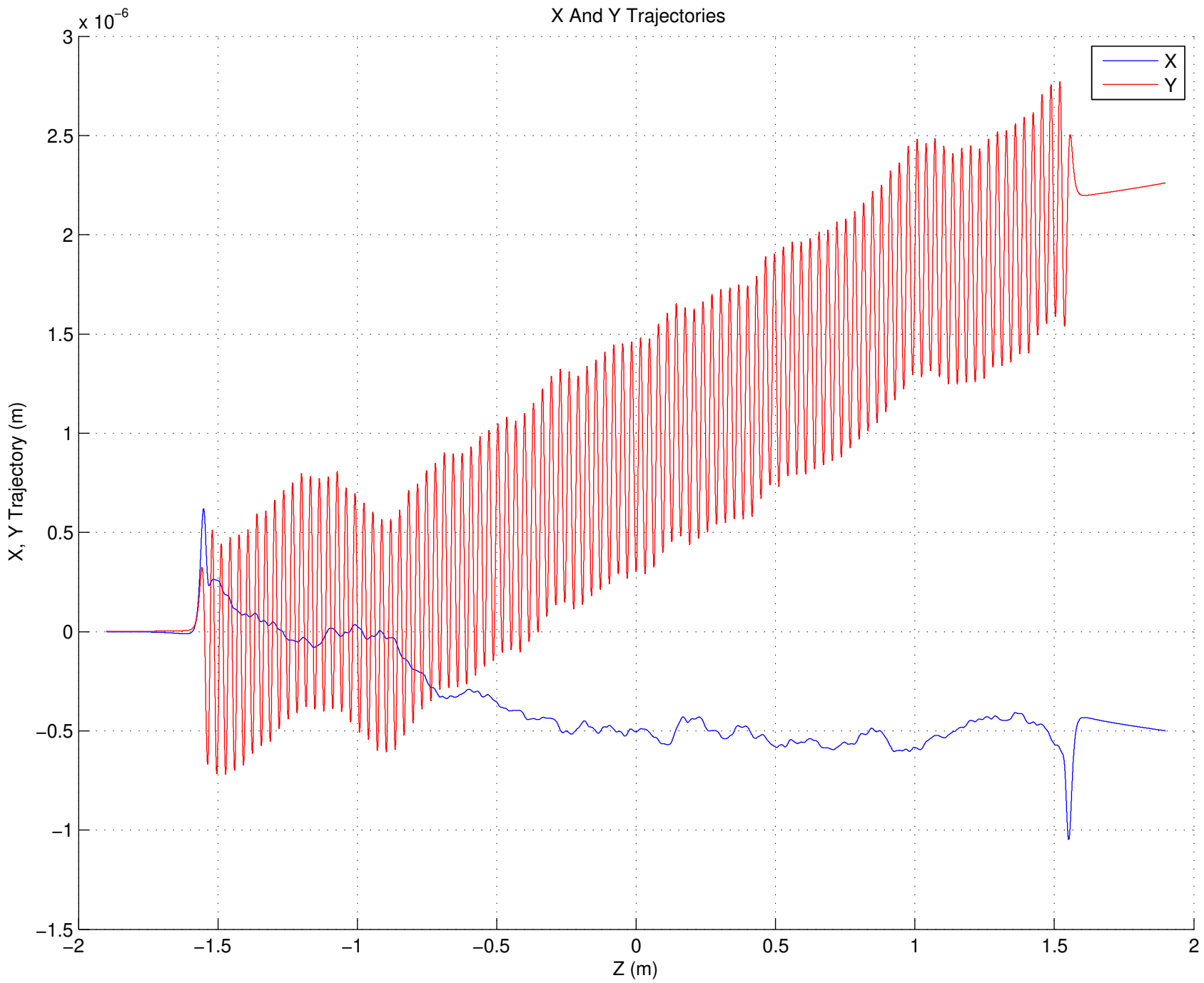

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
Peaks
Zeros
Pole
Peak Field Spacing: Ave = 0.020345 m, RMS = 0.012336 m
Zero Field Spacing: Ave = 0.020378 m, RMS = 0.011093 m

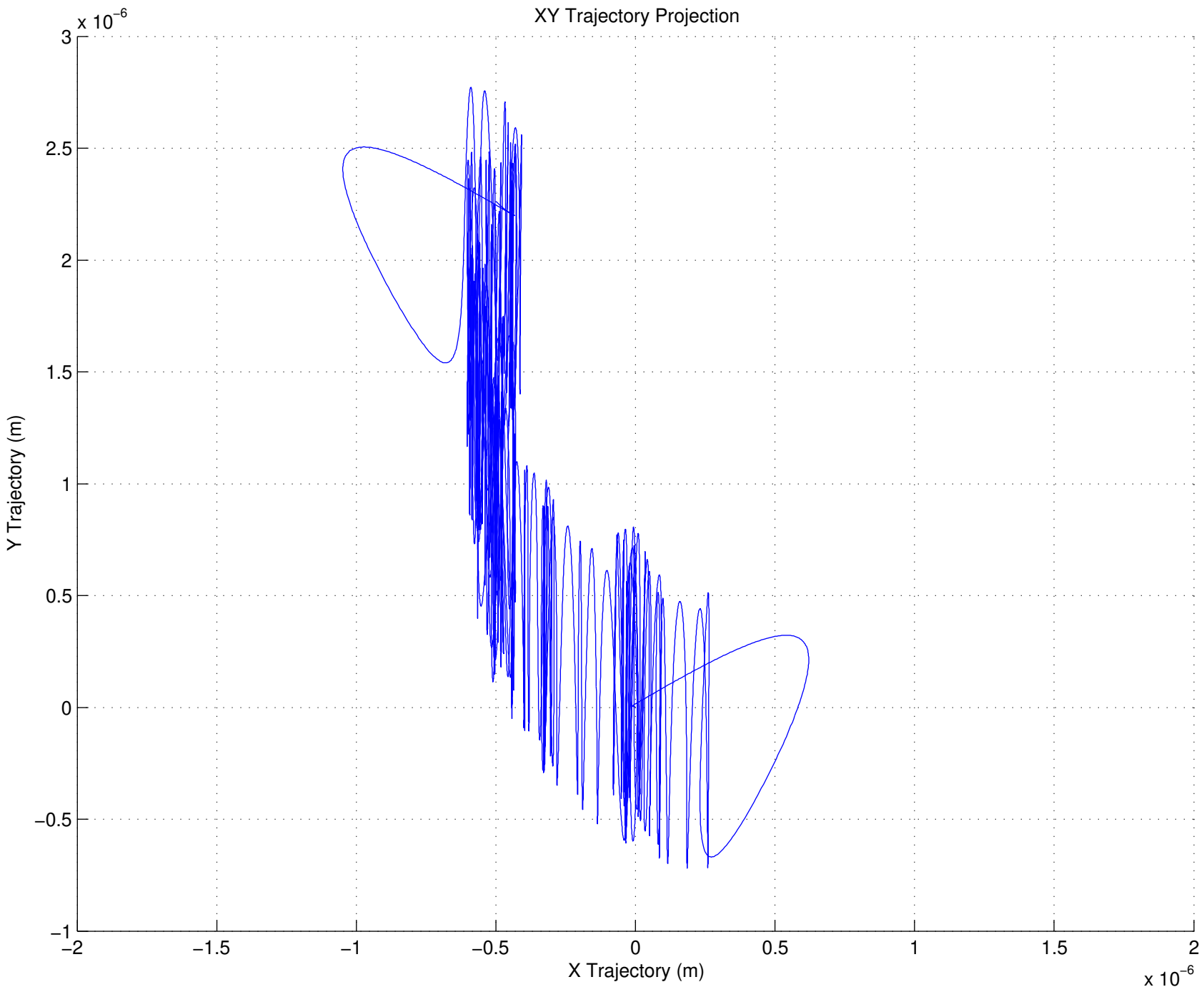

Bx Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
0
2
4
6
8
10
12
14
16
18
20

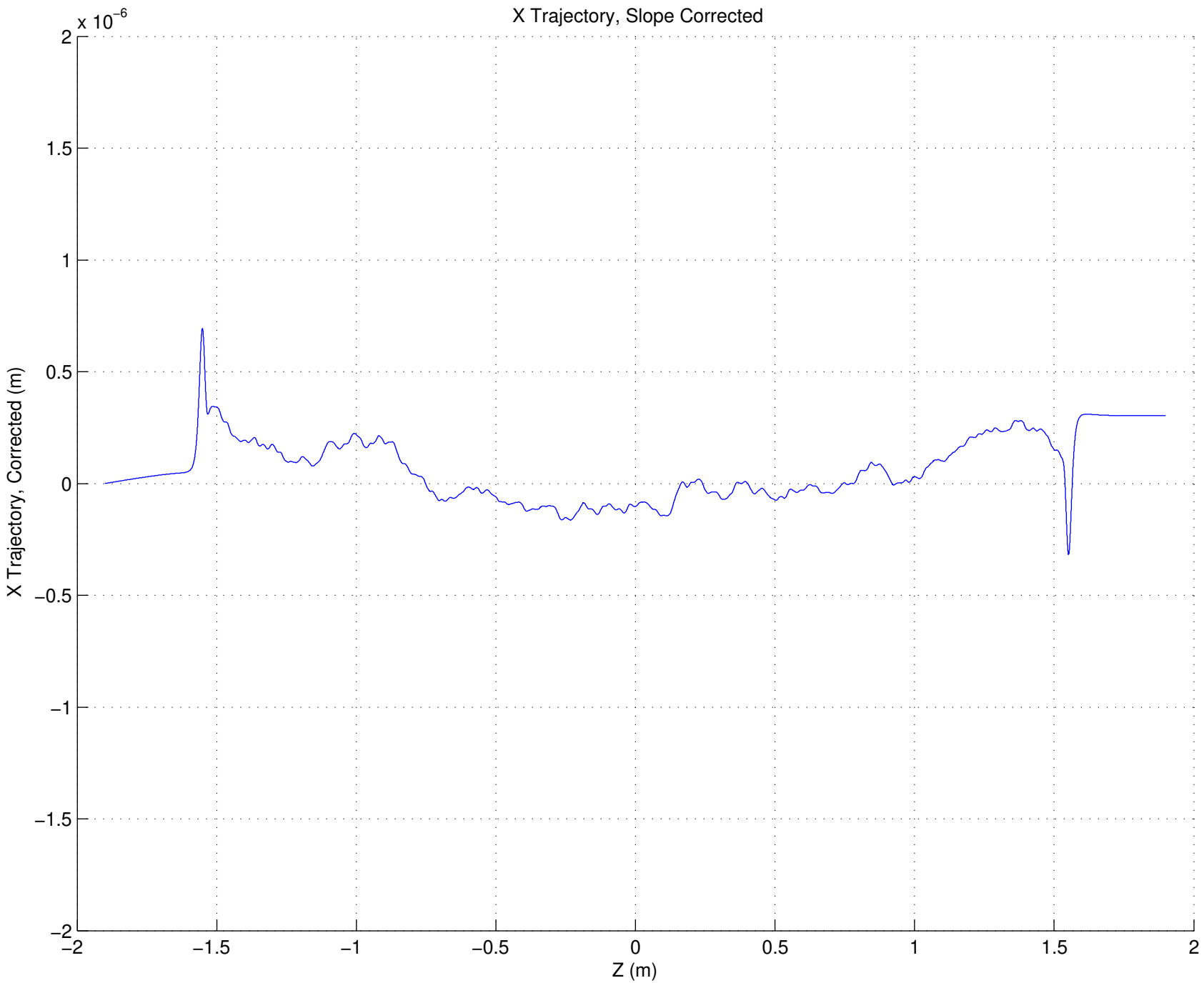

By Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
0
2
4
6
8
10
12
14
16
18
20

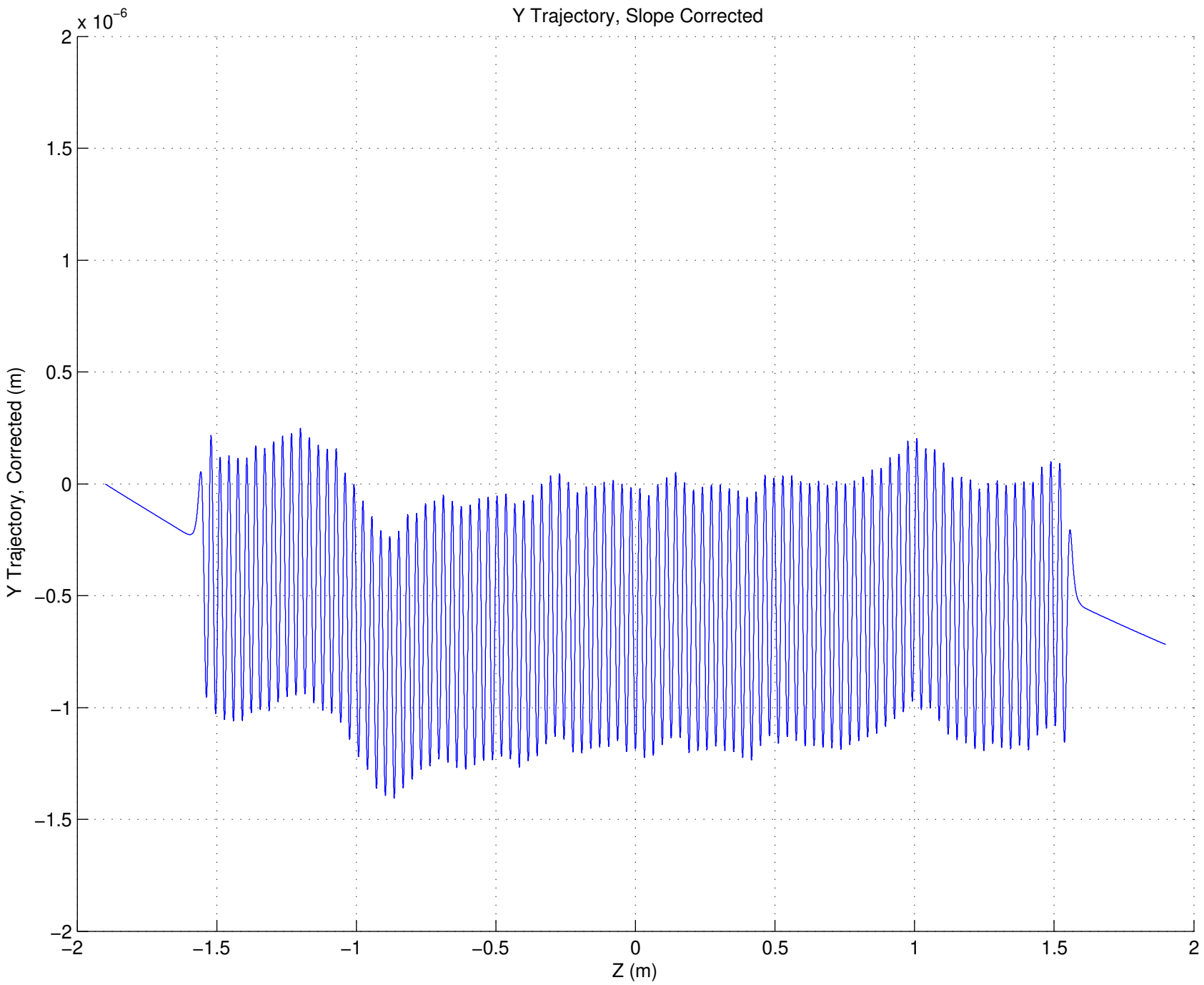

X Trajectory
x 10^-6
5
36
68
99
130
162
193
Pole
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
X Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

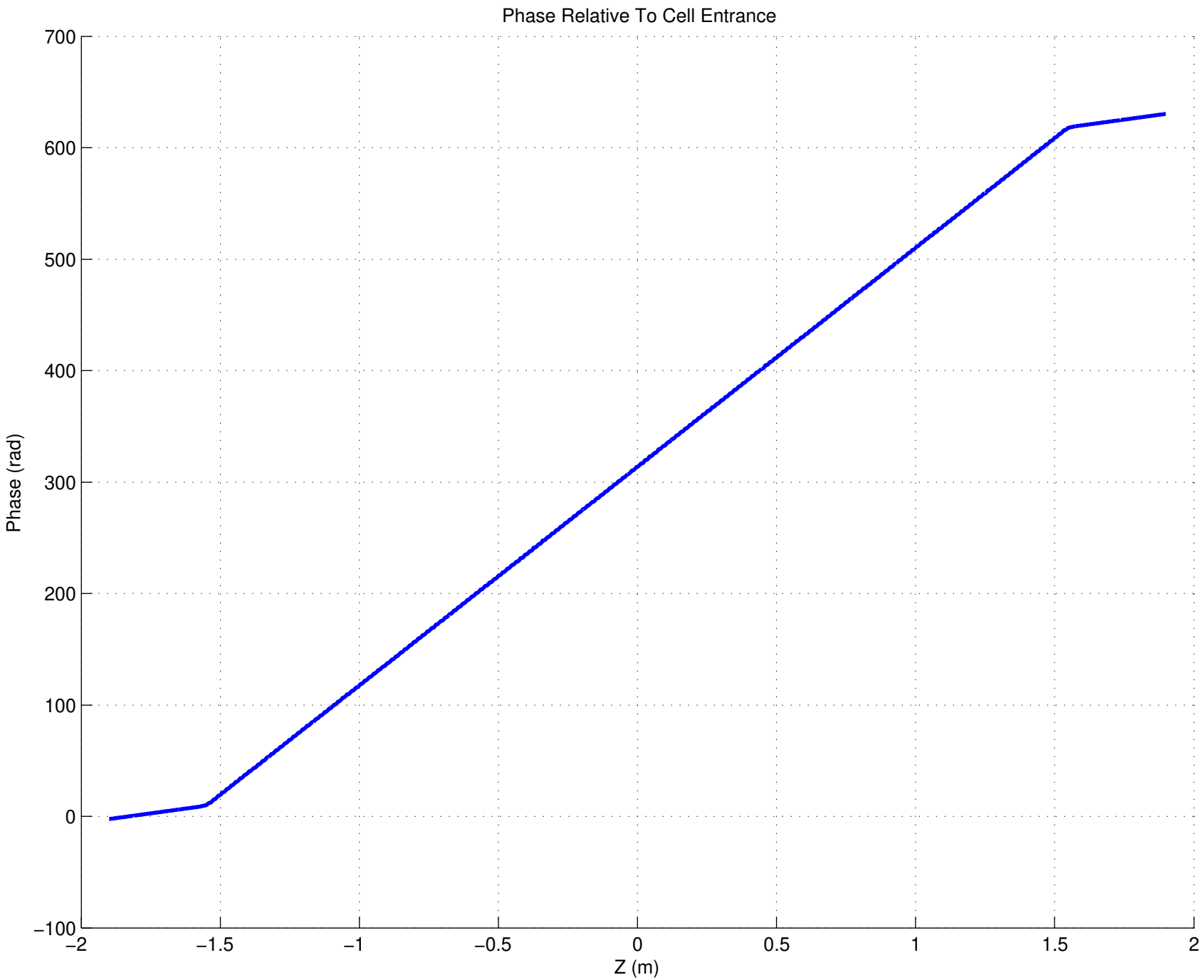

Y Trajectory
x 10^-6
5
36
68
99
130
162
193
Pole
3
2.5
2
1.5
1
0.5
0
−0.5
−1
Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

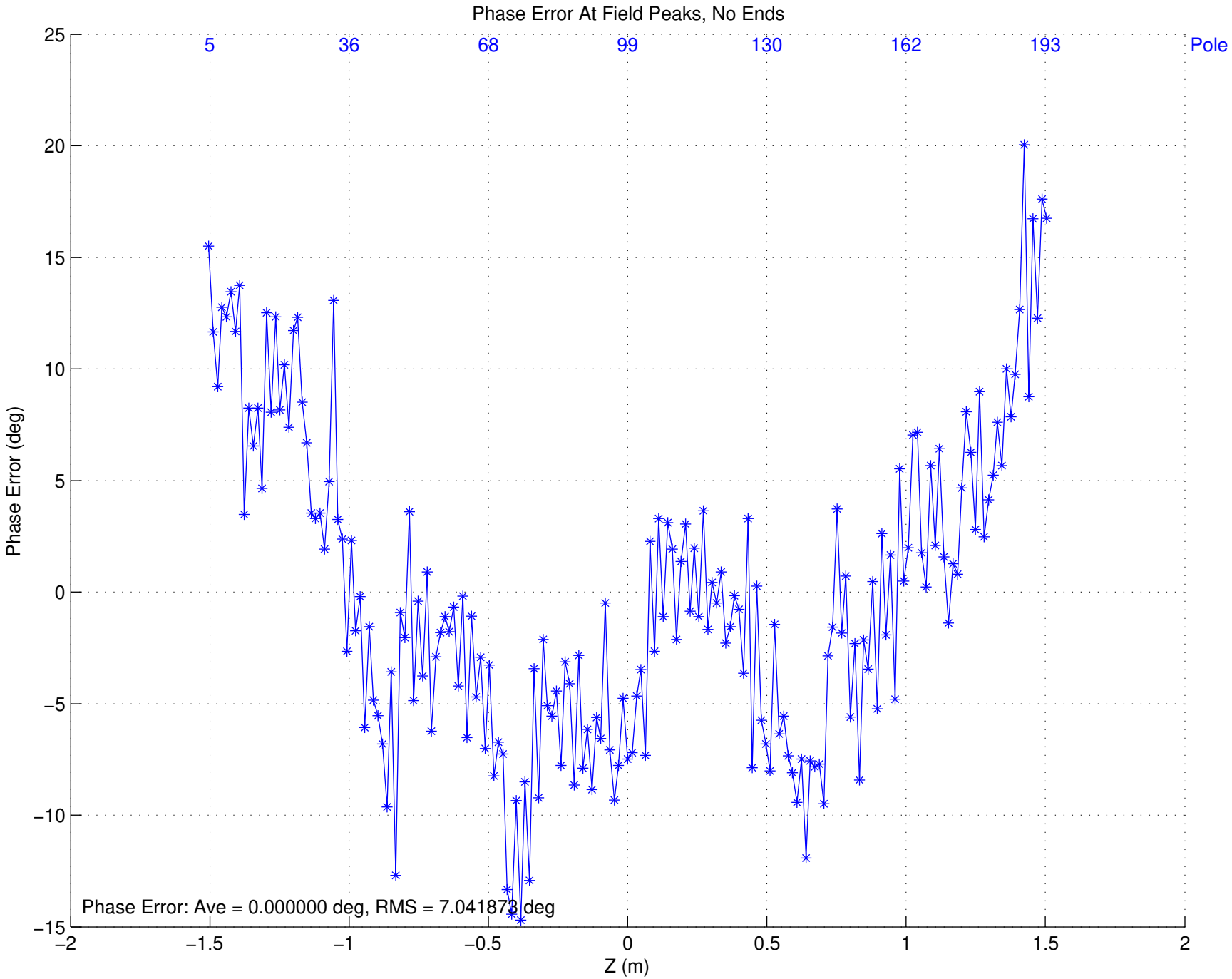

X And Y Trajectories
x 10^-6
3
2.5
2
1.5
1
0.5
0
−0.5
−1
−1.5
X, Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)
X
Y

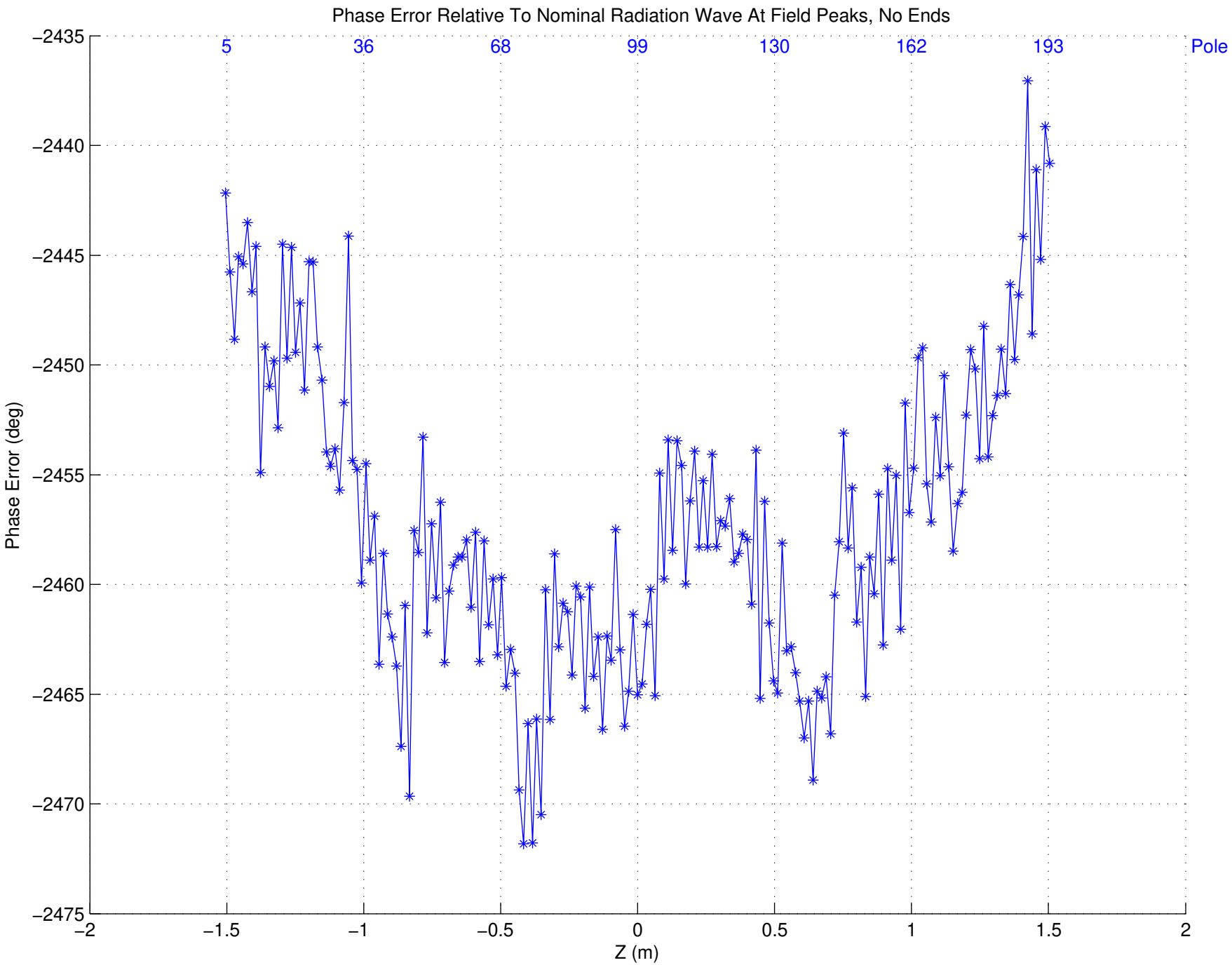

XY Trajectory Projection
x 10^-6
3
2.5
2
1.5
1
0.5
0
−0.5
−1
Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
X Trajectory (m)
x 10^-6

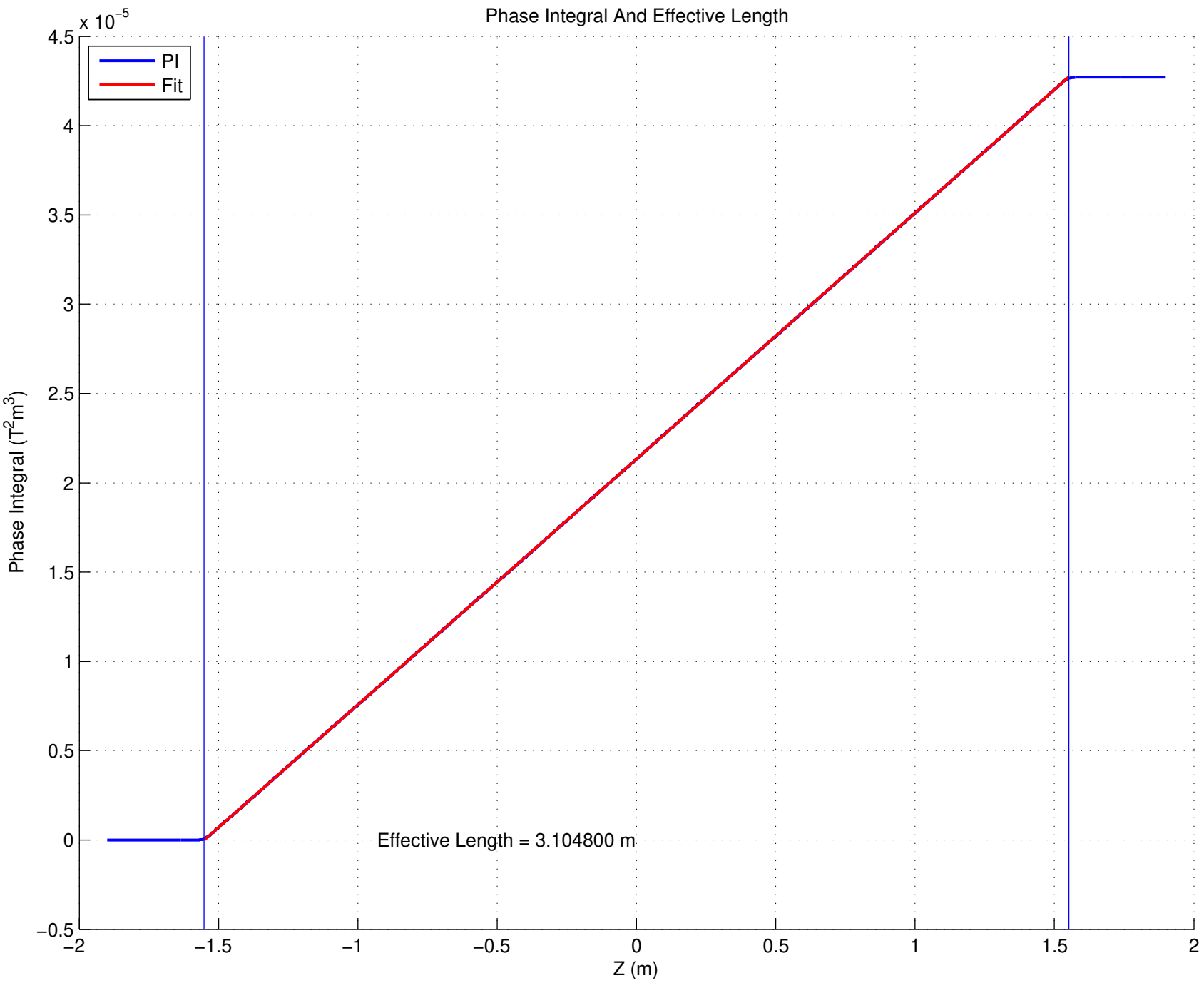

X Trajectory, Slope Corrected
x 10^-6
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
X Trajectory, Corrected (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

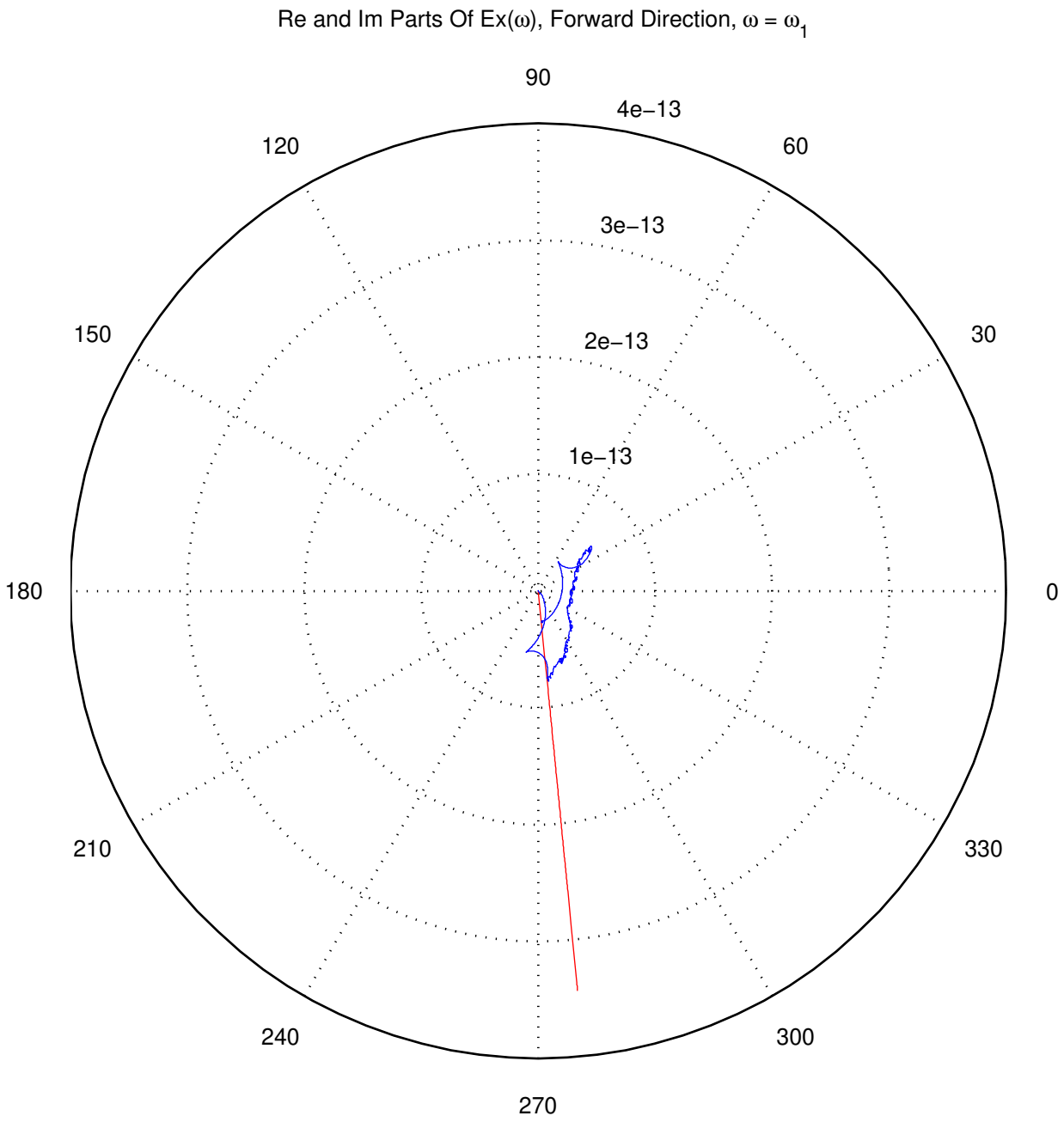

Y Trajectory, Slope Corrected
x 10^-6
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
Y Trajectory, Corrected (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

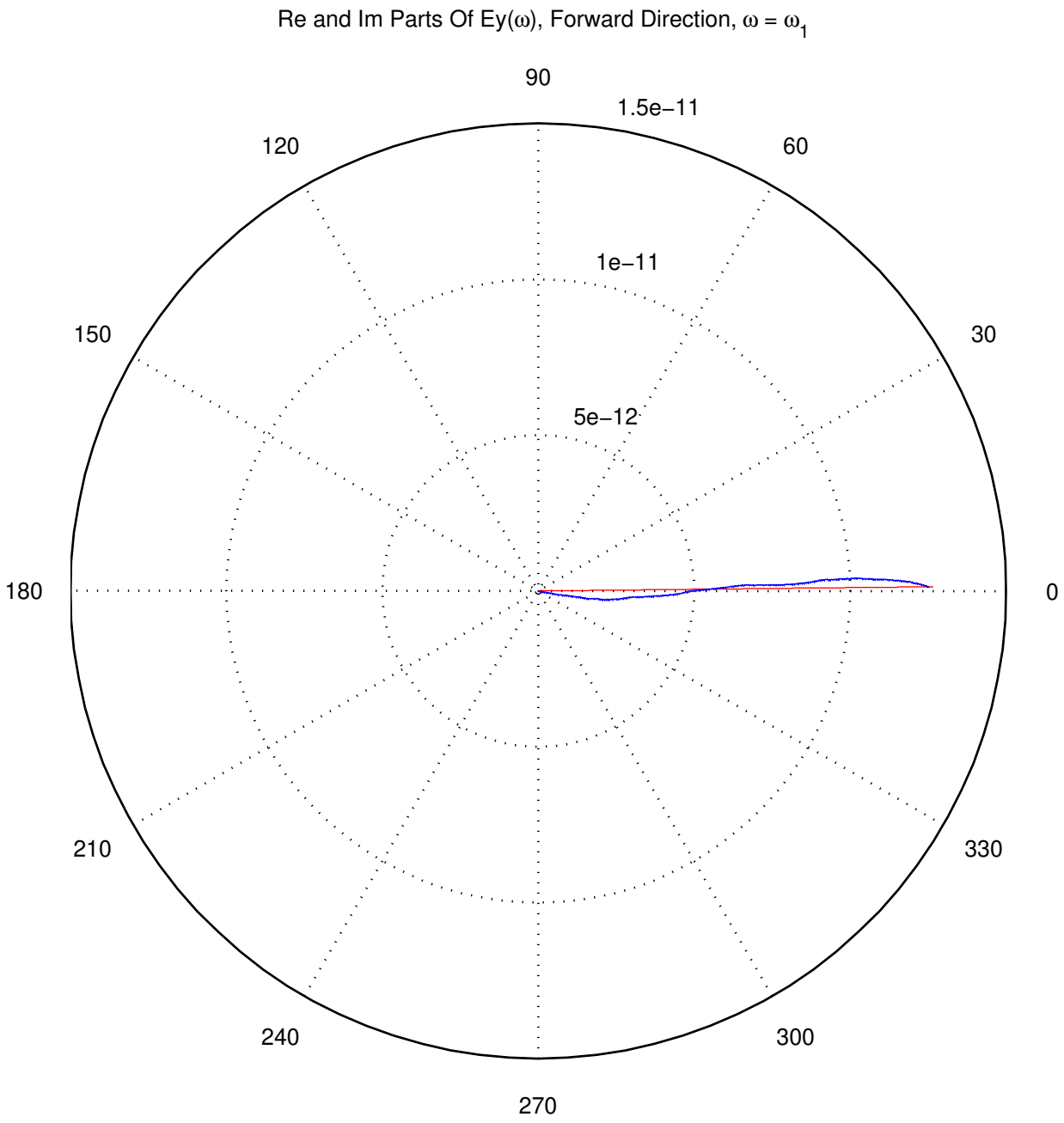

Phase Relative To Cell Entrance
Phase (rad)
700
600
500
400
300
200
100
0
−100
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

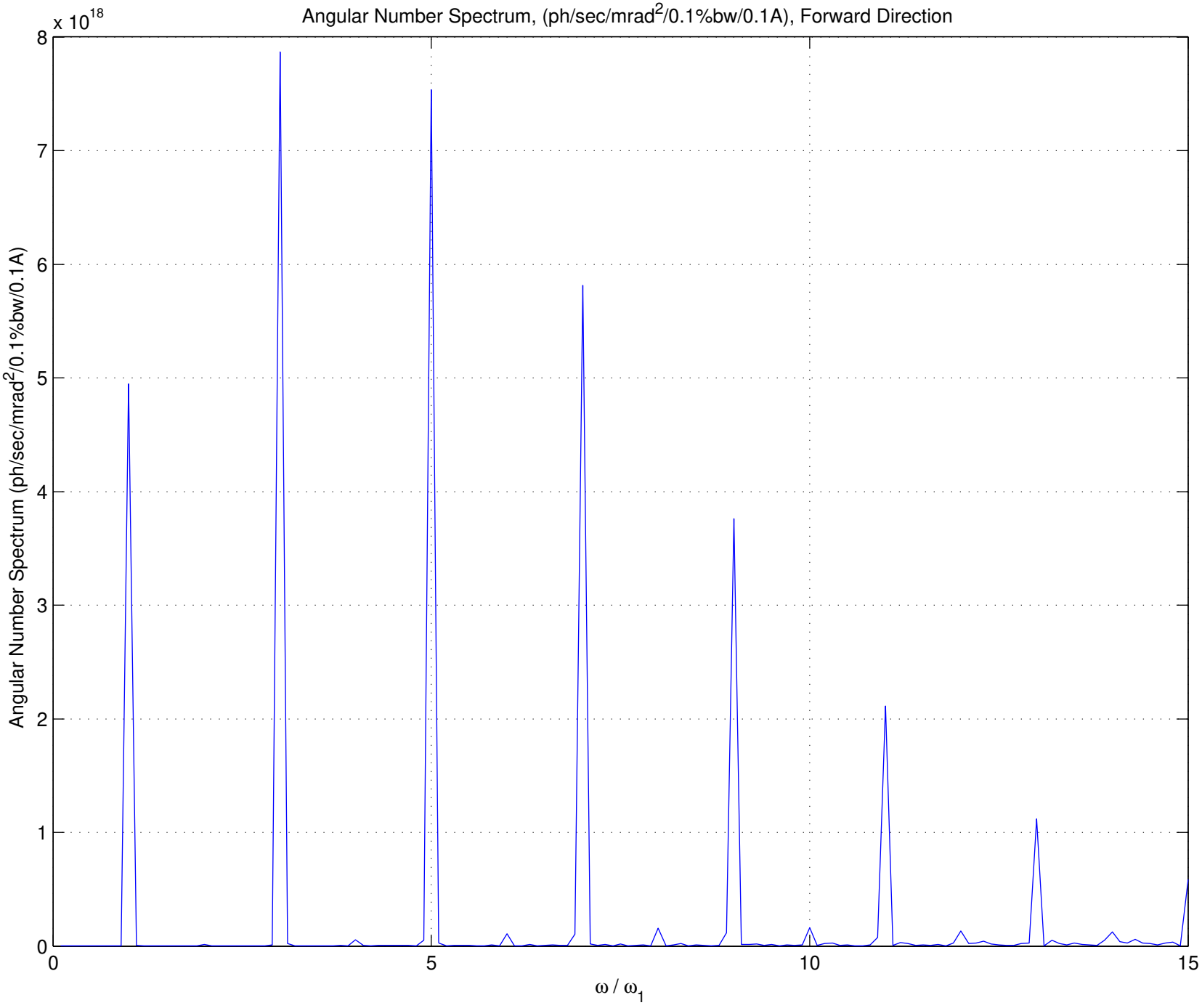

Phase Error At Field Peaks, No Ends
5
36
68
99
130
162
193
Pole
25
20
15
10
5
0
−5
−10
−15
Phase Error (deg)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)
Phase Error: Ave = 0.000000 deg, RMS = 7.041873 deg

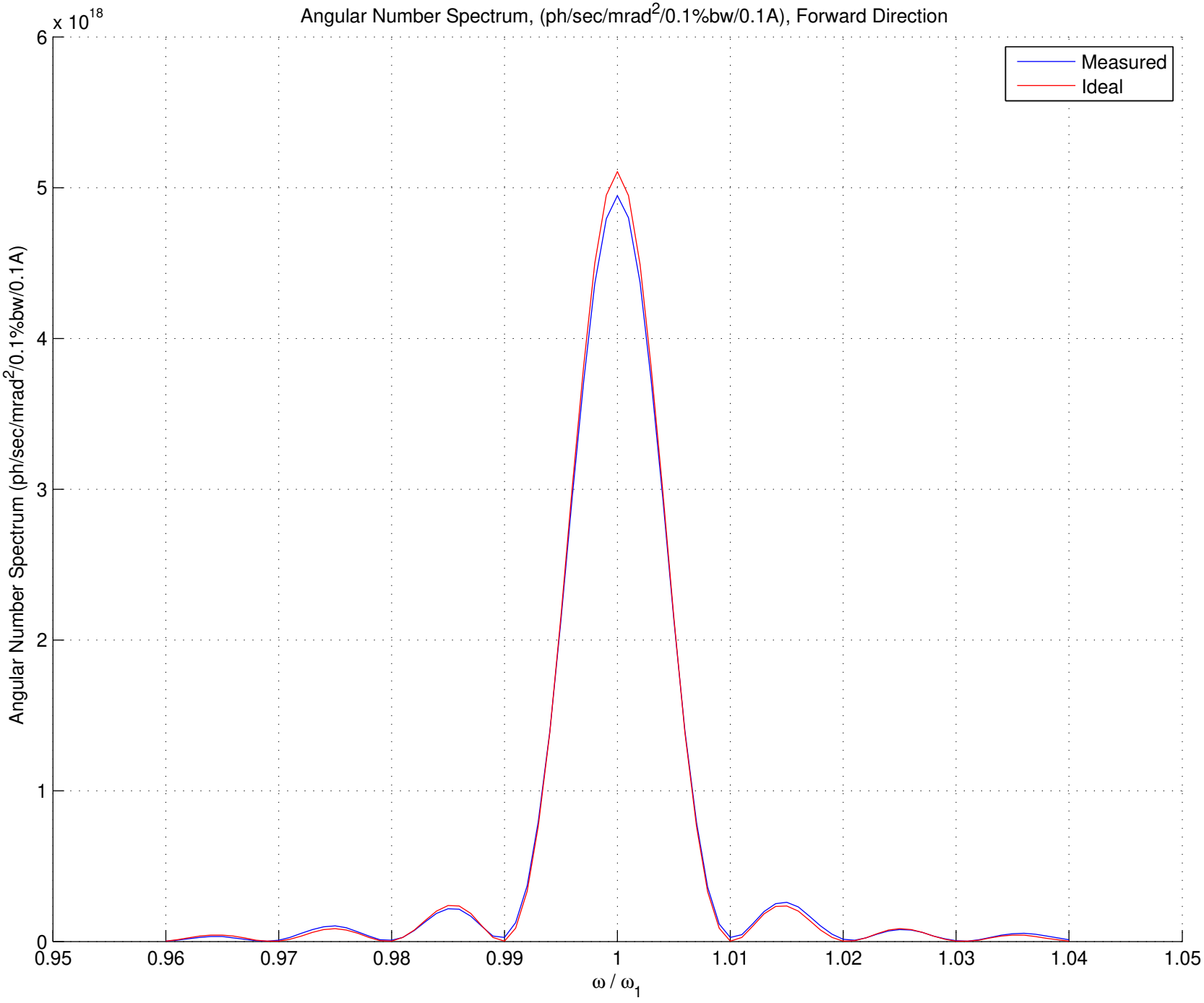

Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
5
36
68
99
130
162
193
Pole
−2435
−2440
−2445
−2450
−2455
−2460
−2465
−2470
−2475
Phase Error (deg)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

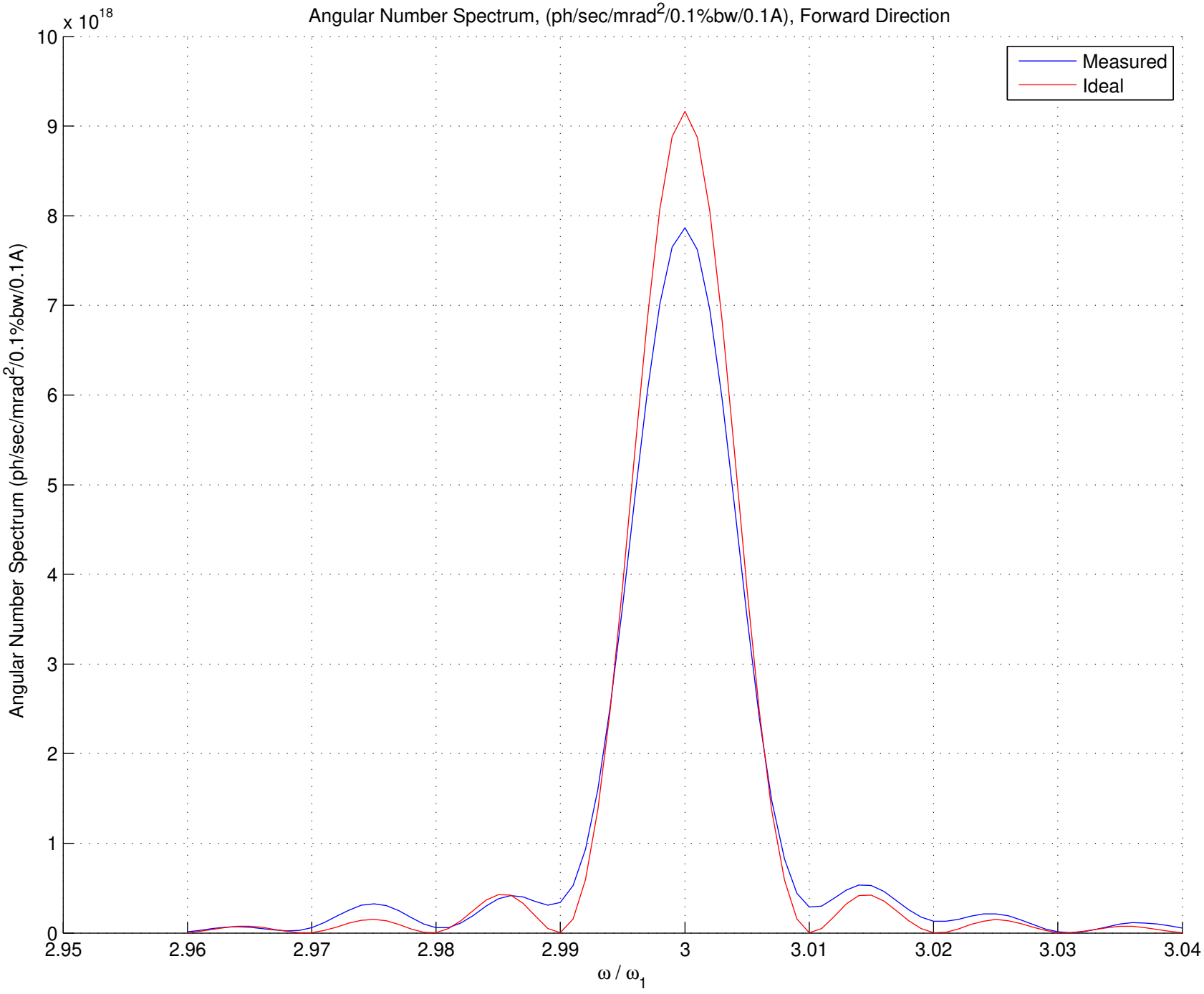

Phase Integral And Effective Length
x 10^-5
PI
Fit
Effective Length = 3.104800 m
Phase Integral (T^2m^3)
Z (m)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
−0.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2

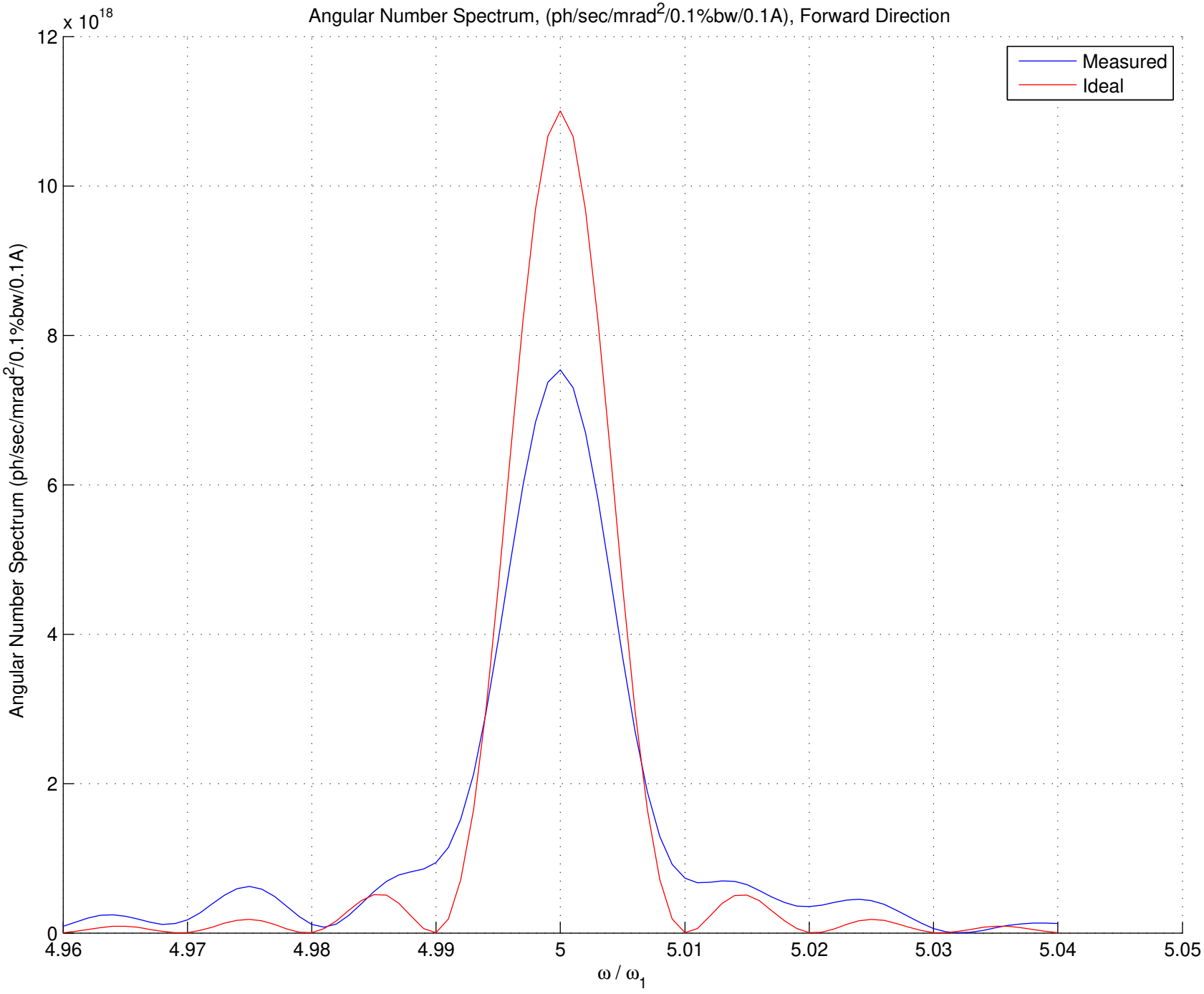

Re and Im Parts Of Ex(ω), Forward Direction, ω = ω1
90
4e−13
120
60
3e−13
150
30
2e−13
1e−13
180
0
210
330
240
300
270


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


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


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
10
9
8
7
6
5
4
3
2
1
0
2.95
2.96
2.97
2.98
2.99
3
3.01
3.02
3.03
3.04


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
2
4
6
8
10
12
4.96
4.97
4.98
4.99
5
5.01
5.02
5.03
5.04
5.05