SLAC Magnetic Measurements

EPU Analysis
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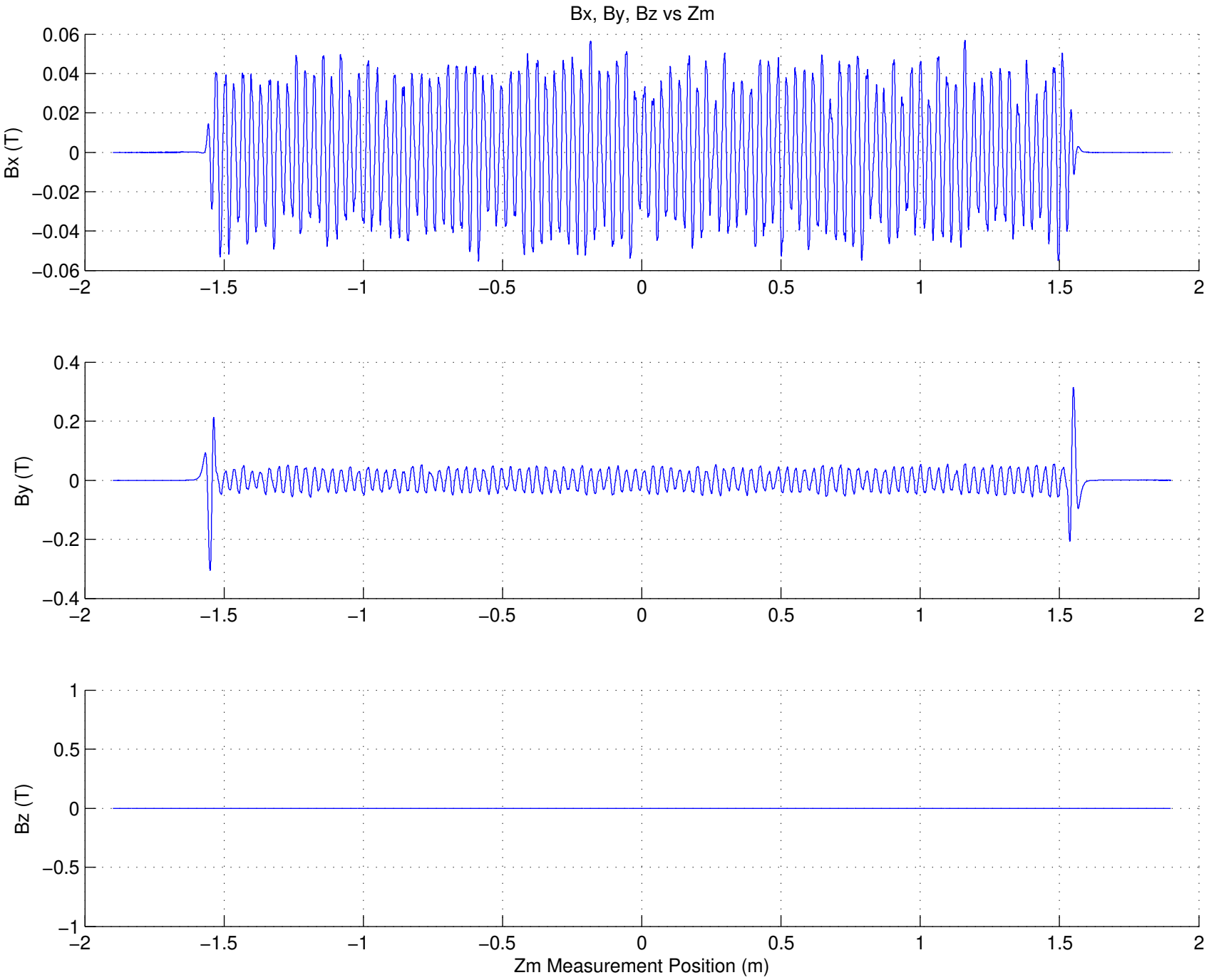
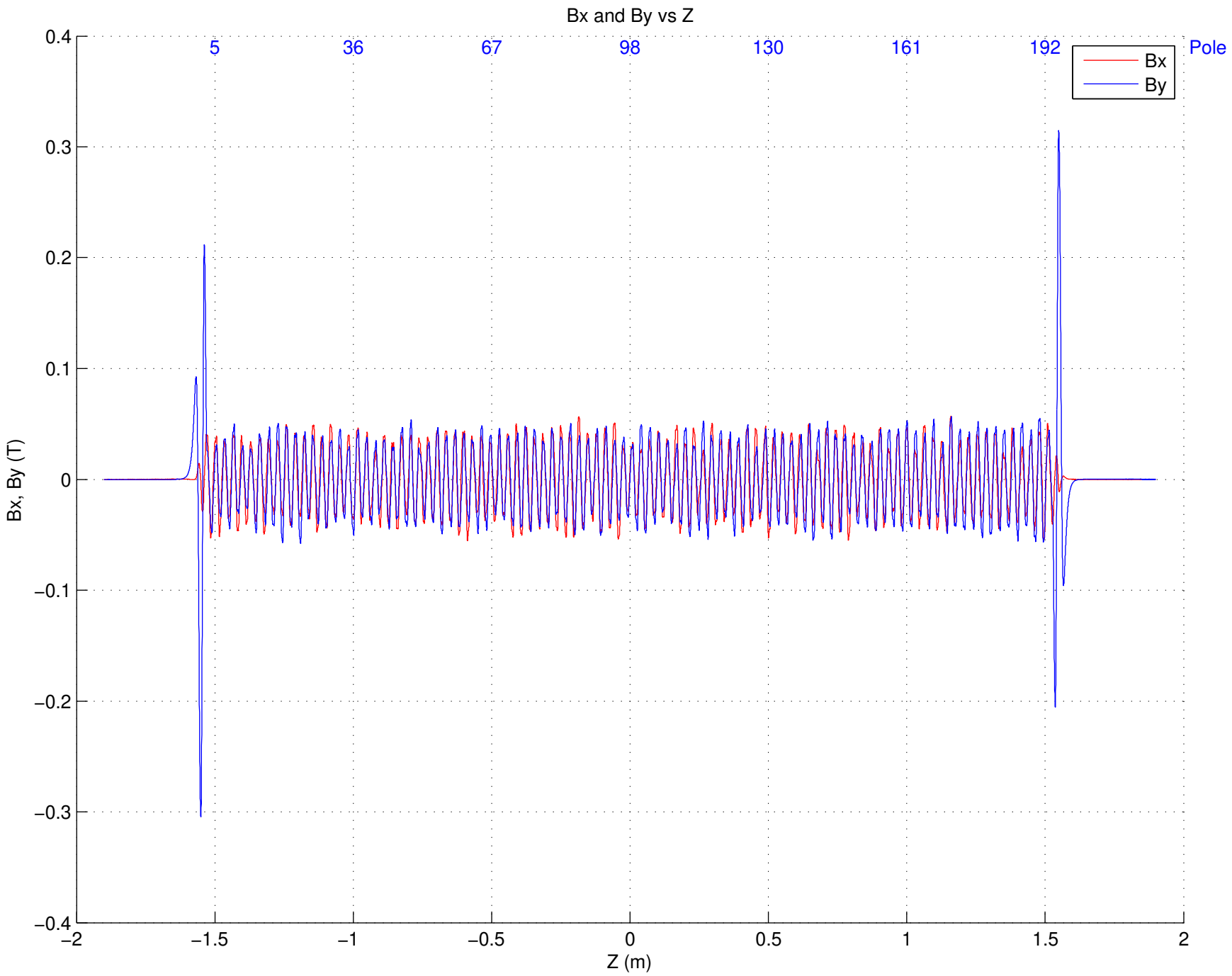
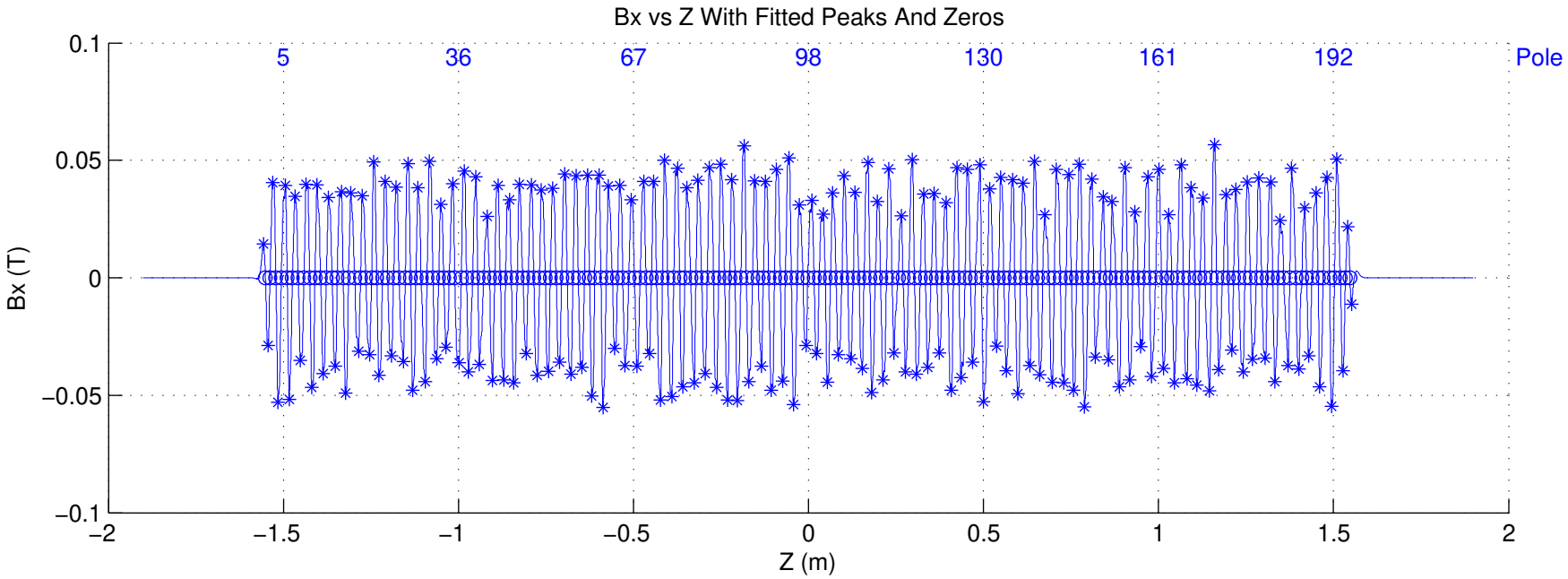
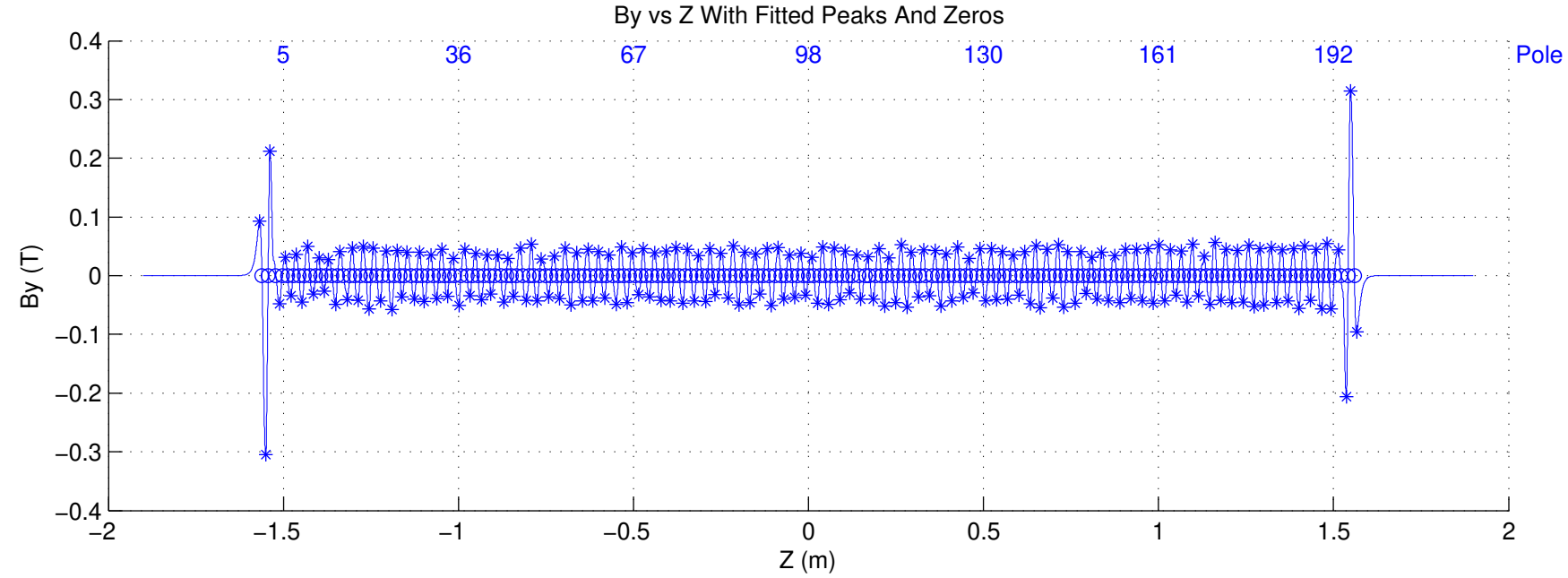
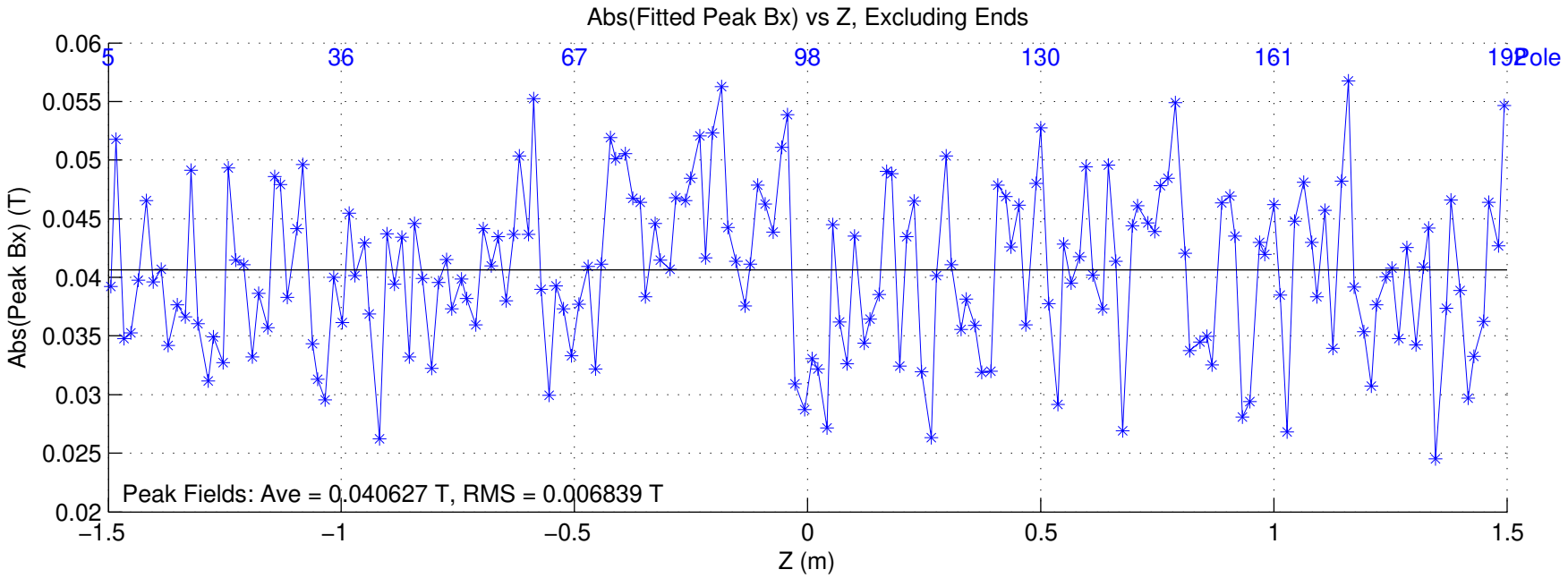
Parameters:
INPUT–FILE–DIR =V:\MET\MagServe\MagData\DELTA\Superpose Quadrants Q1 300microns\LP13F\KR007(
INPUT–FILE–NAME =superpose–quadrants.dat
INPUT–FILE–TYPE =ZBXYZH
CORR–REQUIRED =0
GAMMA =26671.59
NOM–LAMBDA–U =0
NOM–K–VALUE =0
NOM–LAMBDA–R =0
NUM–POLES =196
NUM–END–POLES =4
CELL–LENGTH =3.656

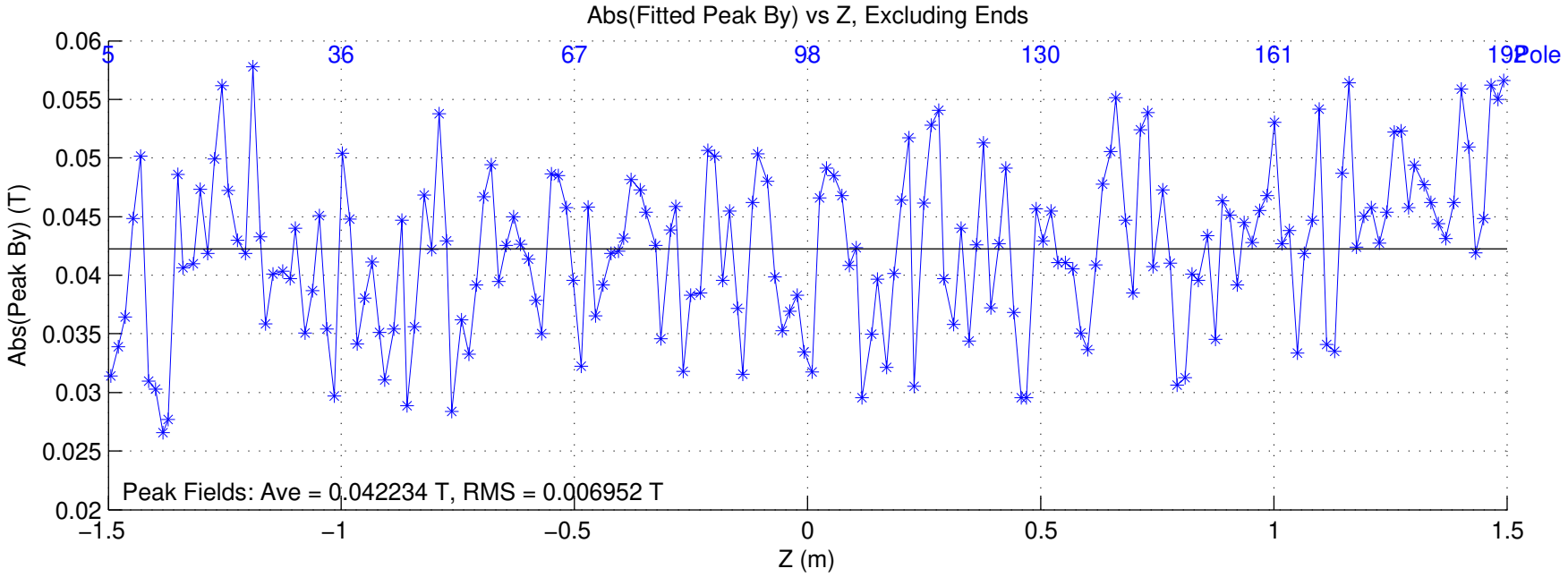

Bx, By, Bz vs Zm
Bx (T)
0.06
0.04
0.02
0
−0.02
−0.04
−0.06
By (T)
0.4
0.2
0
−0.2
−0.4
Bz (T)
1
0.5
0
−0.5
−1
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Zm Measurement Position (m)

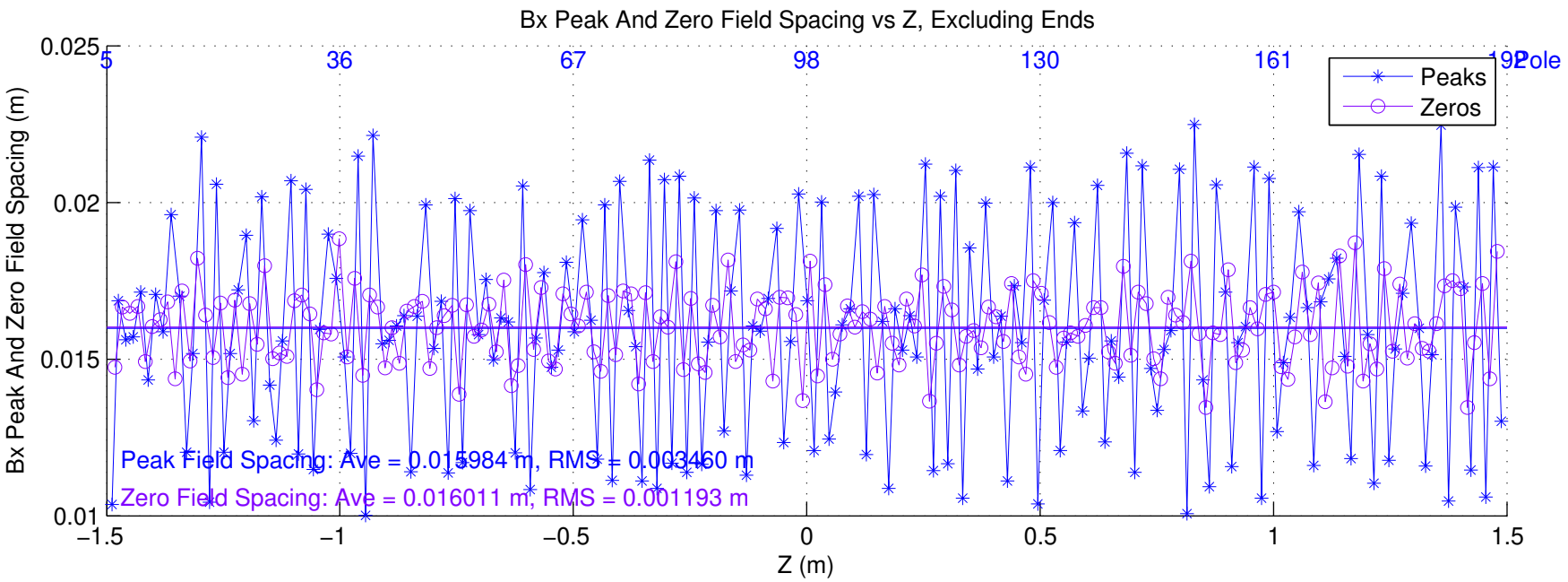

Bx and By vs Z
5
36
67
98
130
161
192
Pole
Bx
By
0.4
0.3
0.2
0.1
0
−0.1
−0.2
−0.3
−0.4
Bx, By (T)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

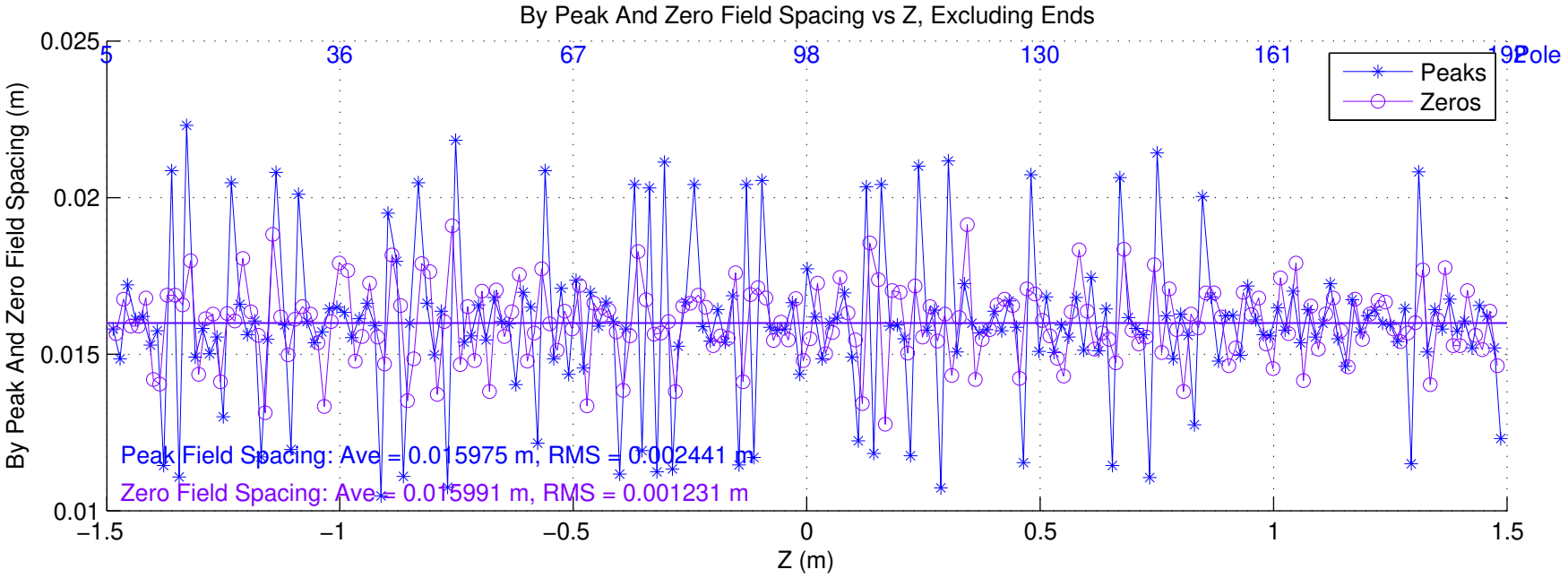

Bx vs Z With Fitted Peaks And Zeros
5
36
67
98
130
161
192
Pole
0.1
0.05
0
−0.05
−0.1
Bx (T)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

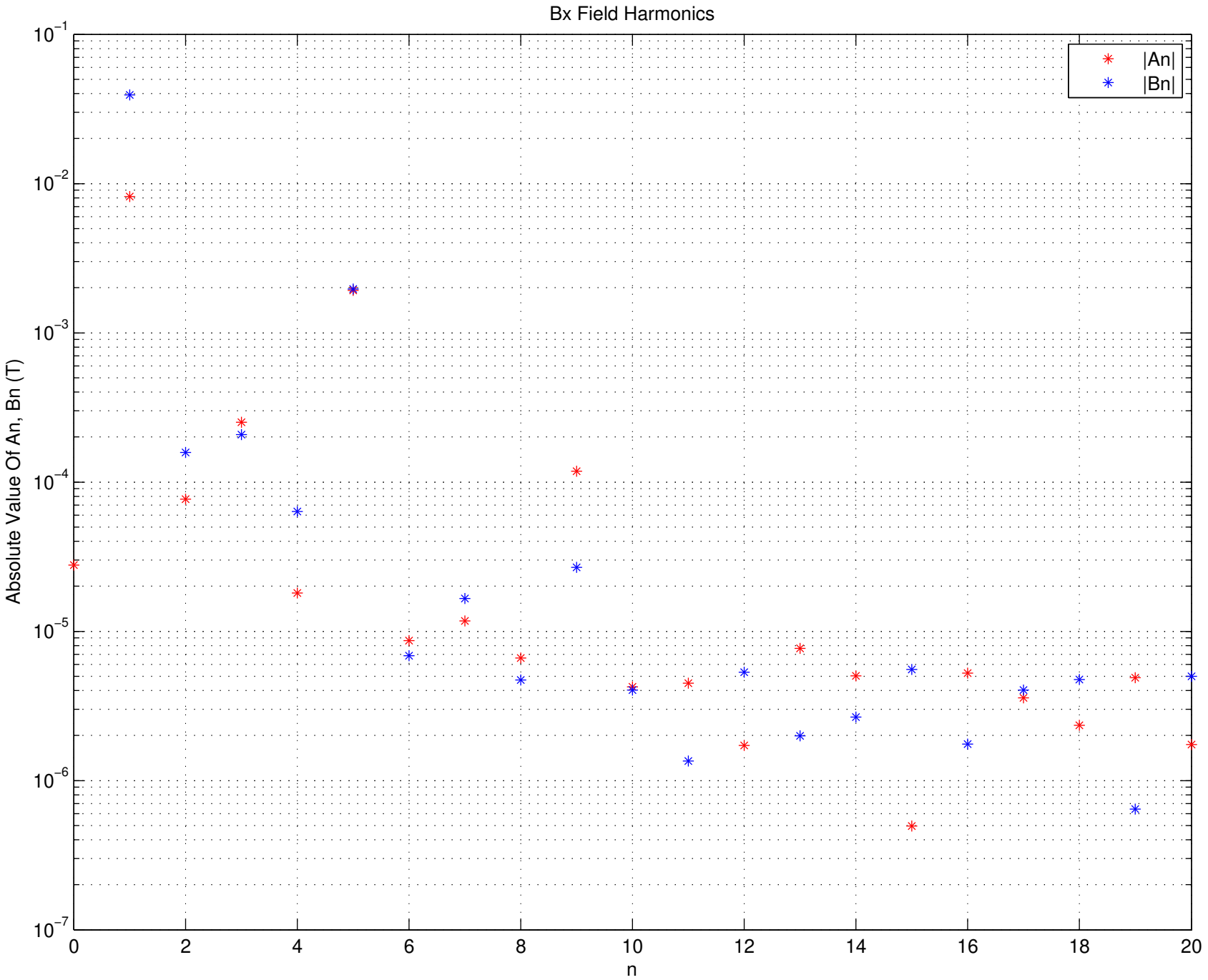

By vs Z With Fitted Peaks And Zeros
5
36
67
98
130
161
192
Pole
0.4
0.3
0.2
0.1
0
−0.1
−0.2
−0.3
−0.4
By (T)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

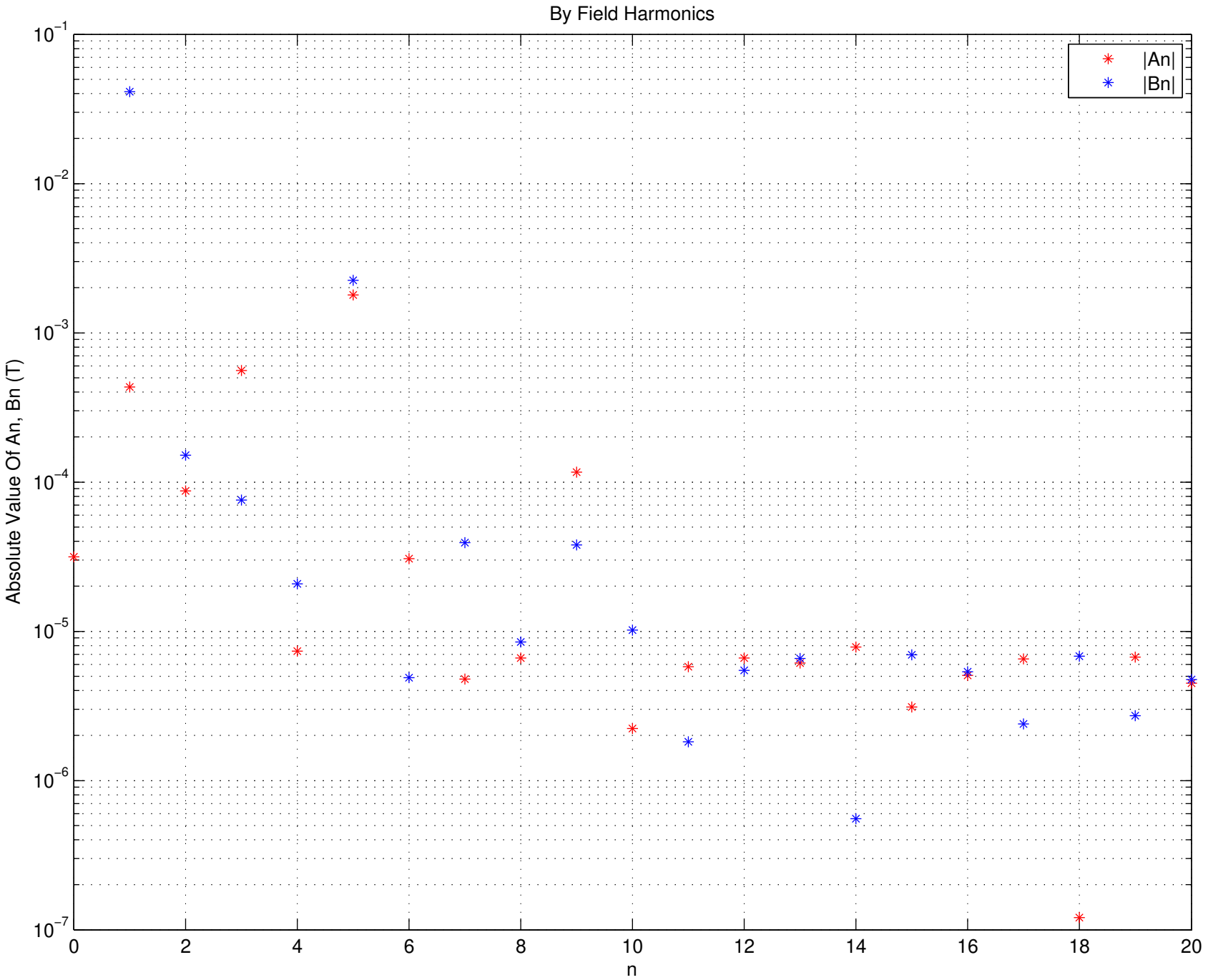

Abs(Fitted Peak Bx) vs Z, Excluding Ends
5
36
67
98
130
161
192
Pole
0.06
0.055
0.05
0.045
0.04
0.035
0.03
0.025
0.02
Abs(Peak Bx) (T)
Peak Fields: Ave = 0.040627 T, RMS = 0.006839 T
−1.5
−1
−0.5
0
0.5
1
1.5
Z (m)

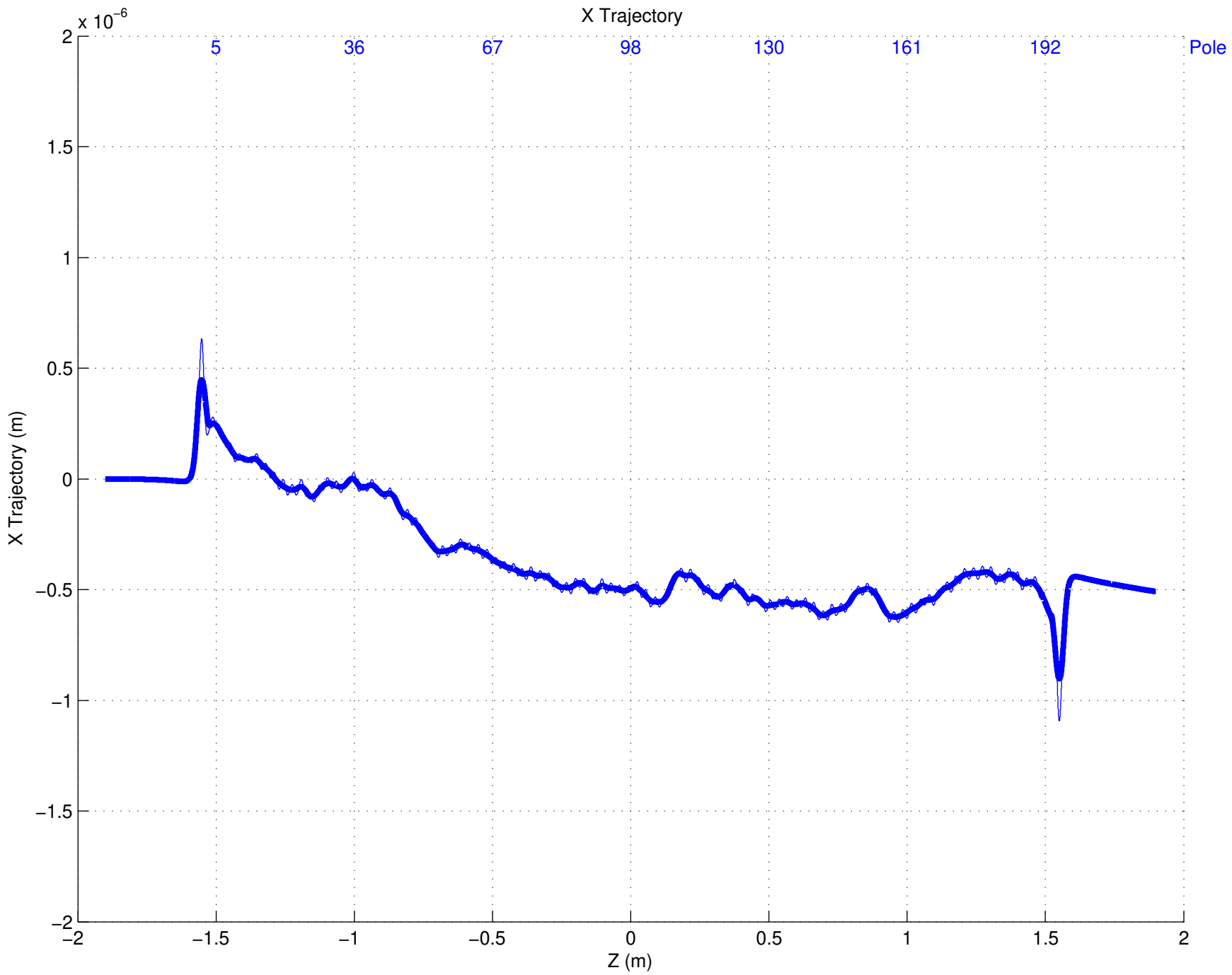

Abs(Fitted Peak By) vs Z, Excluding Ends
5
36
67
98
130
161
192
Pole
0.06
0.055
0.05
0.045
0.04
0.035
0.03
0.025
0.02
Abs(Peak By) (T)
Peak Fields: Ave = 0.042234 T, RMS = 0.006952 T
−1.5
−1
−0.5
0
0.5
1
1.5
Z (m)

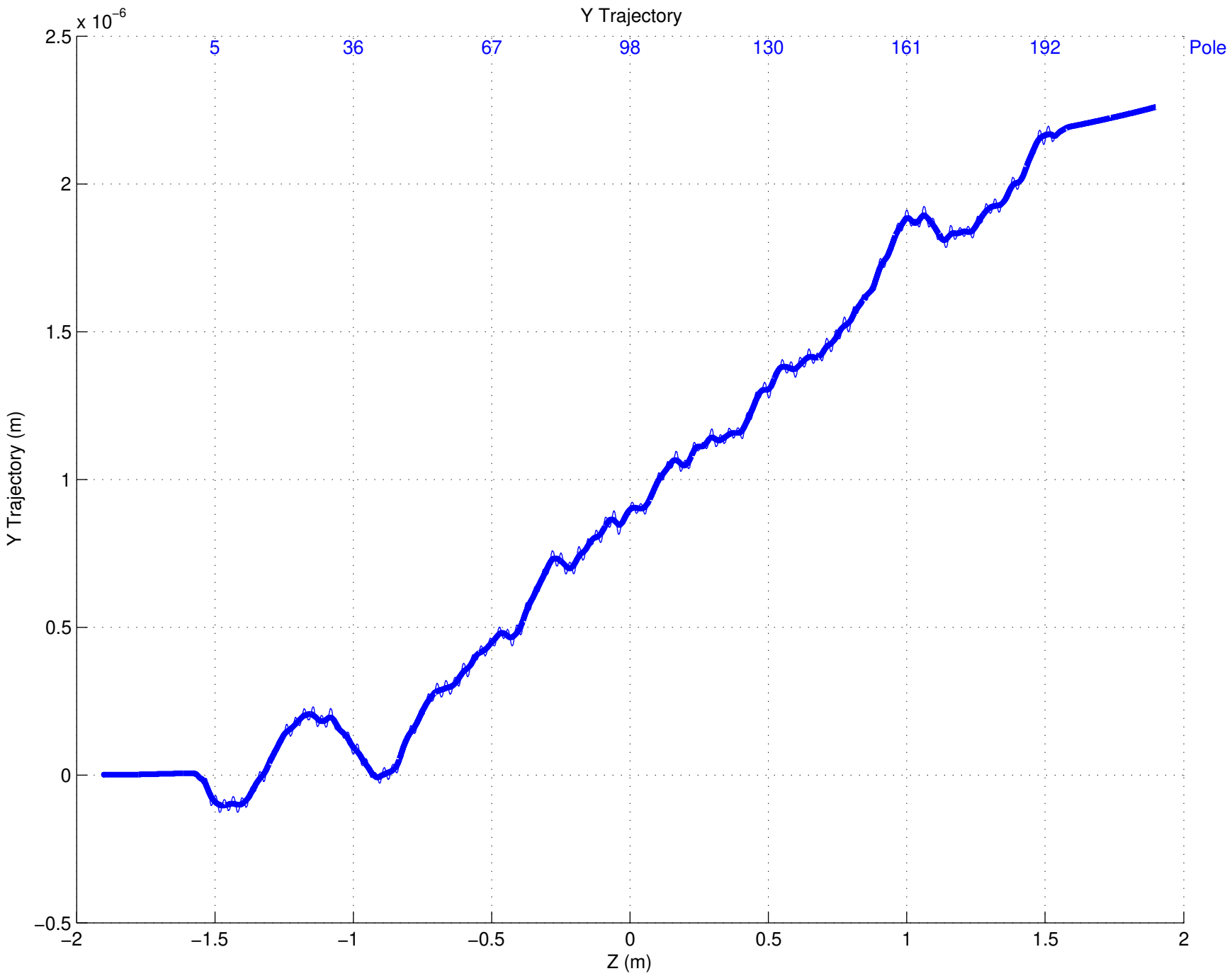

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
5
36
67
98
130
161
192
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.015984 m, RMS = 0.003460 m
Zero Field Spacing: Ave = 0.016011 m, RMS = 0.001193 m
0.025
0.02
0.015
0.01
−1.5
−1
−0.5
0
0.5
1
1.5

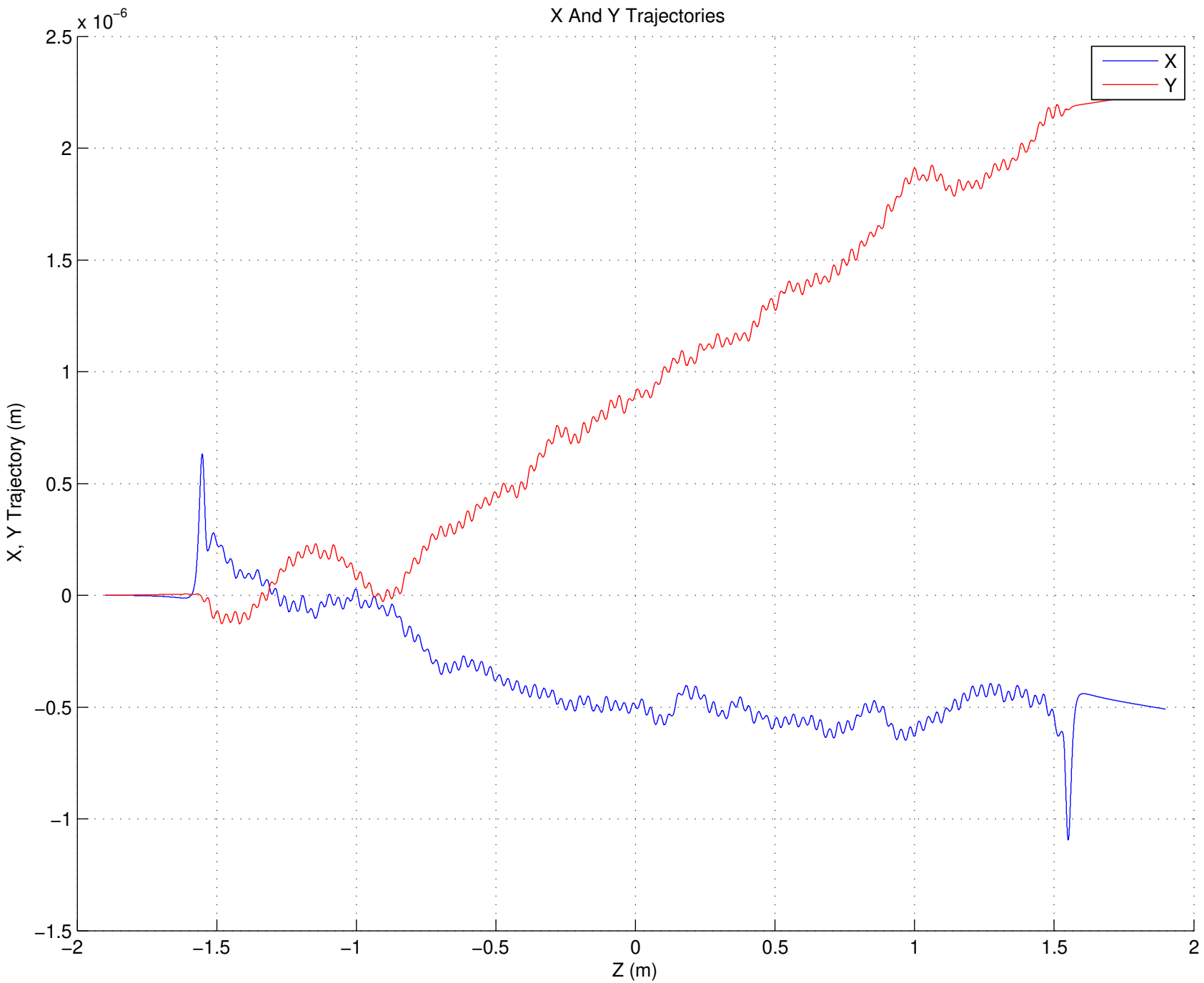

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
5
36
67
98
130
161
192
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.015975 m, RMS = 0.002441 m
Zero Field Spacing: Ave = 0.015991 m, RMS = 0.001231 m
0.025
0.02
0.015
0.01
−1.5
−1
−0.5
0
0.5
1
1.5

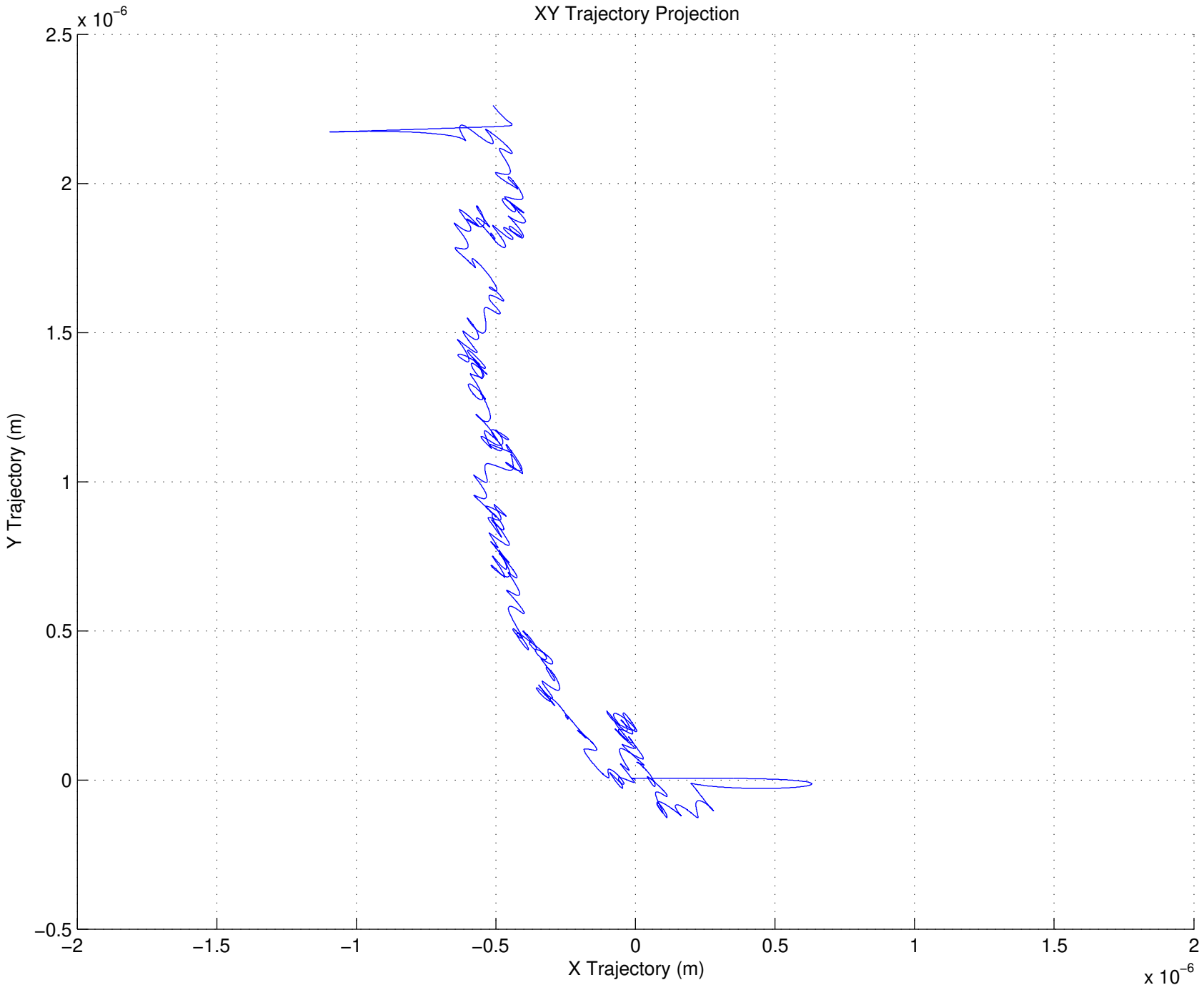

Bx Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
0
2
4
6
8
10
12
14
16
18
20

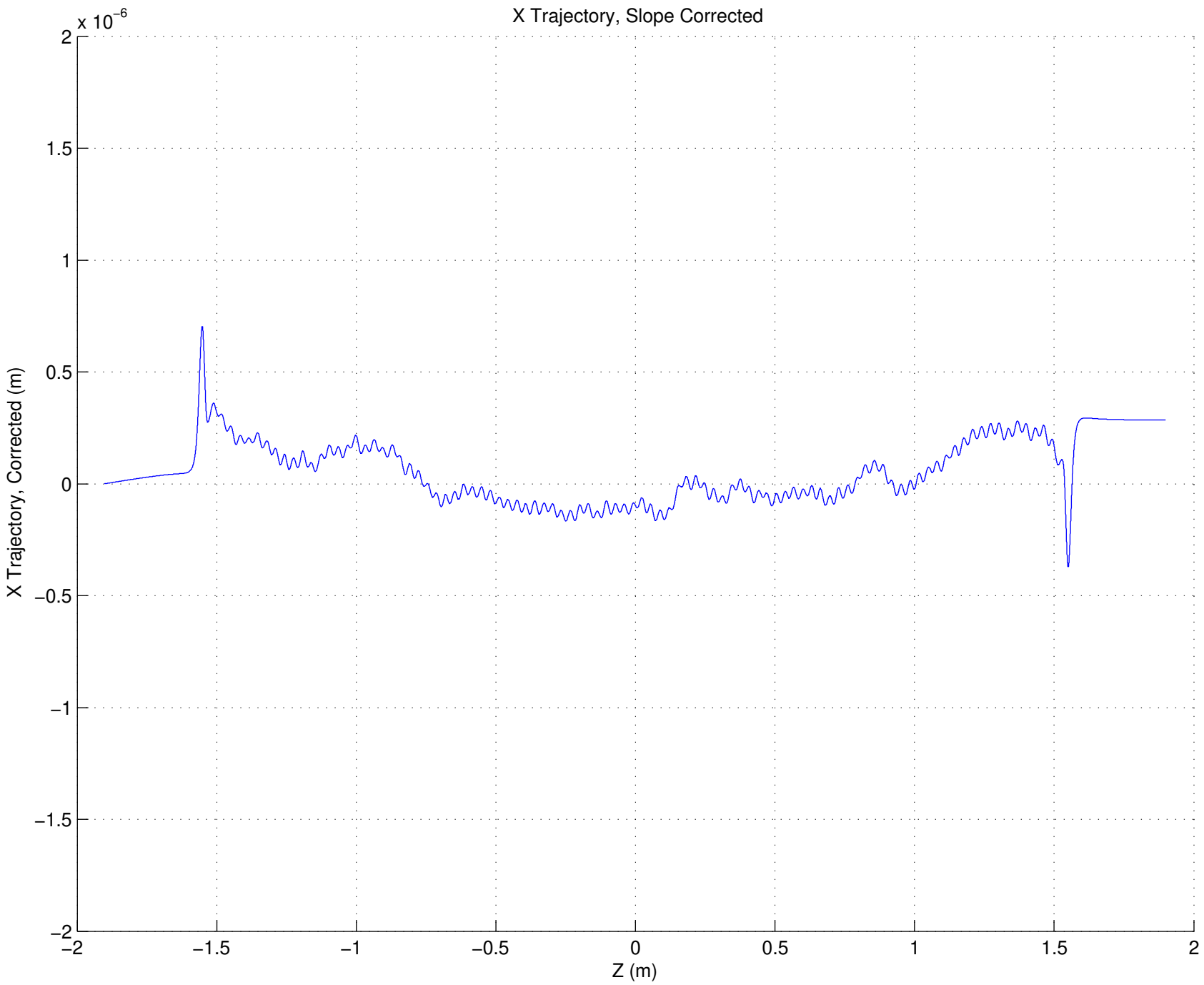

By Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
0
2
4
6
8
10
12
14
16
18
20

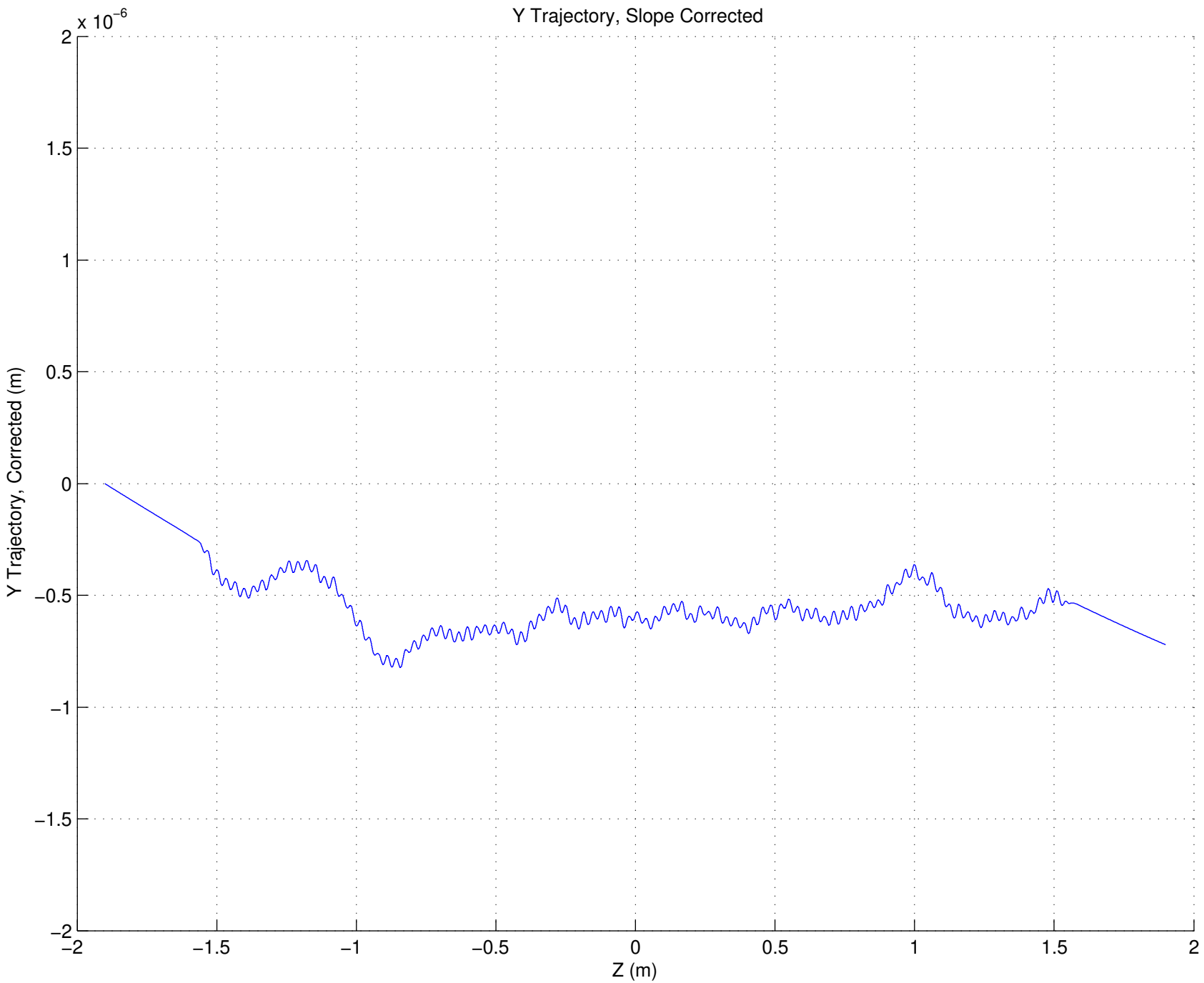

X Trajectory
x 10^-6
5
36
67
98
130
161
192
Pole
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
X Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

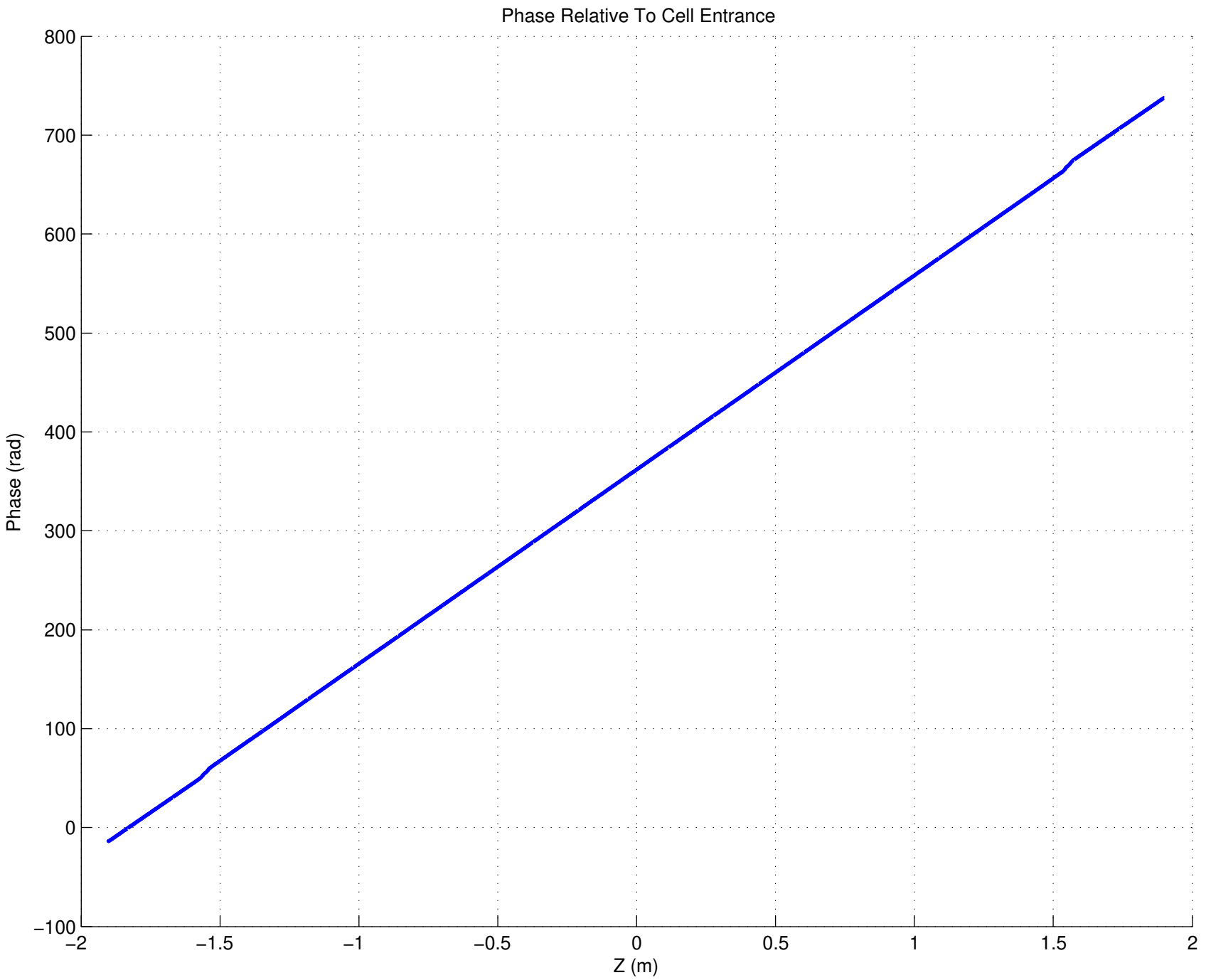

Y Trajectory
x 10^-6
5
36
67
98
130
161
192
Pole
2.5
2
1.5
1
0.5
0
−0.5
Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

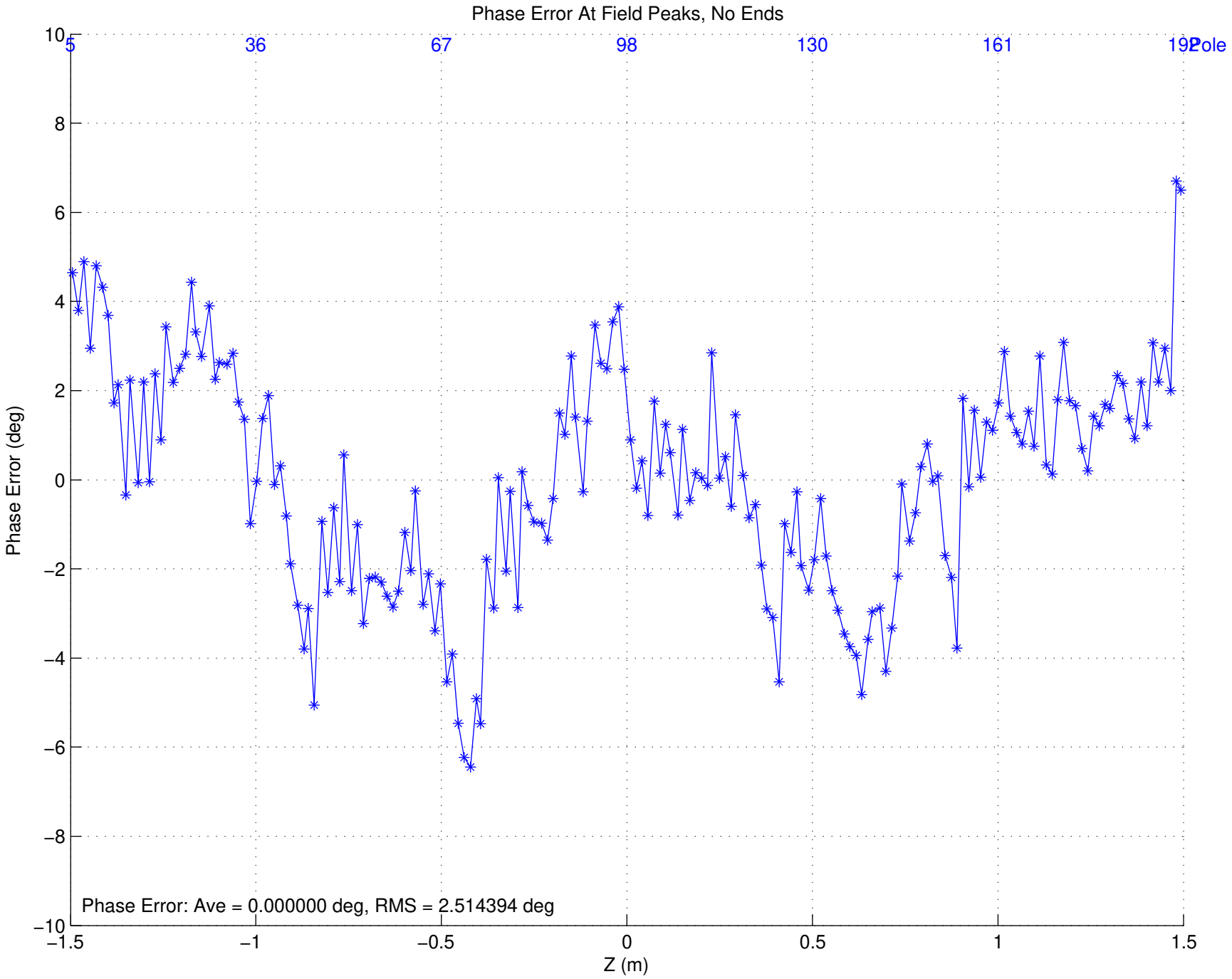

X And Y Trajectories
x 10^-6
2.5
2
1.5
1
0.5
0
−0.5
−1
−1.5
X, Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)
X
Y

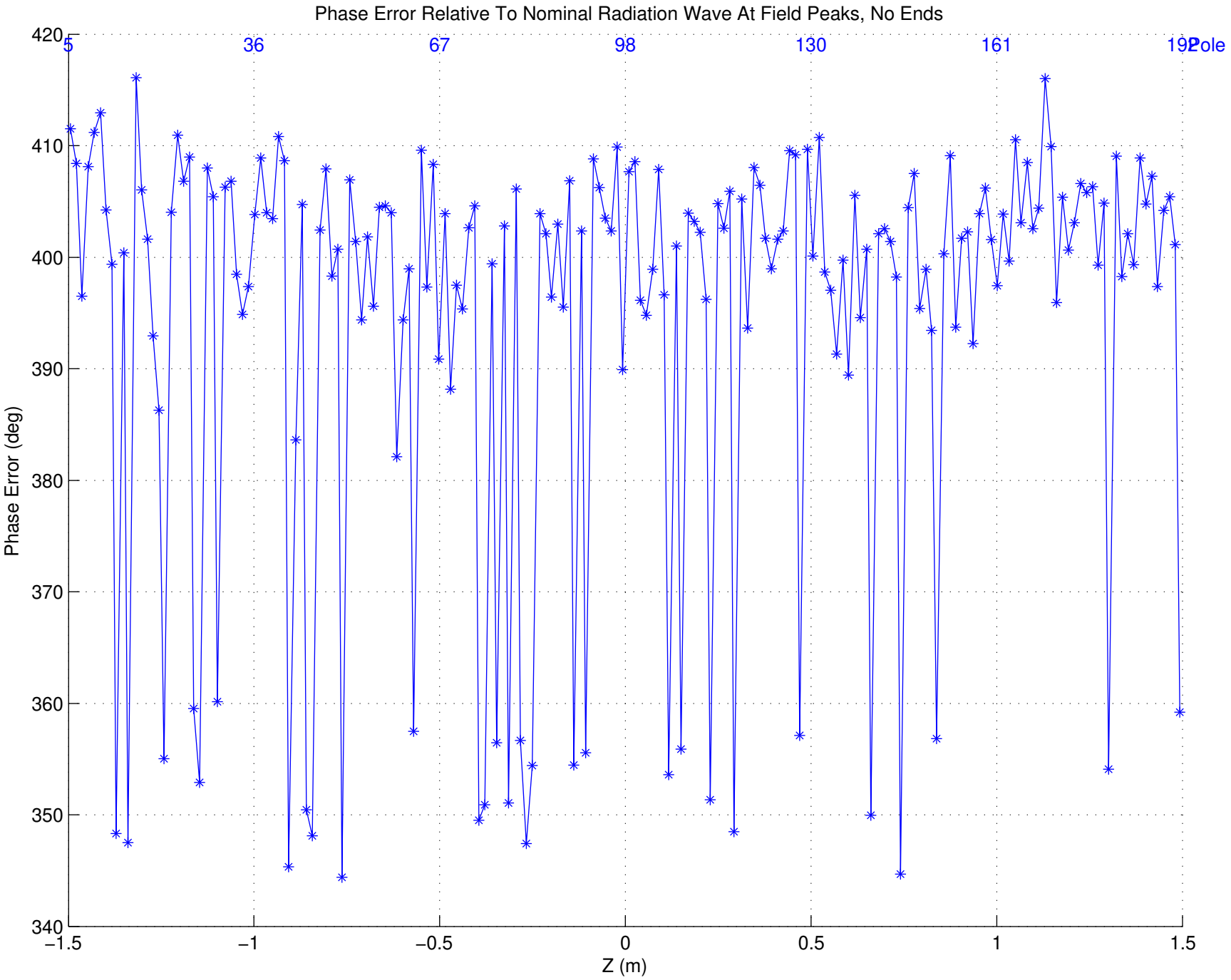

XY Trajectory Projection
x 10^-6
2.5
2
1.5
1
0.5
0
−0.5
Y Trajectory (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
X Trajectory (m)
x 10^-6

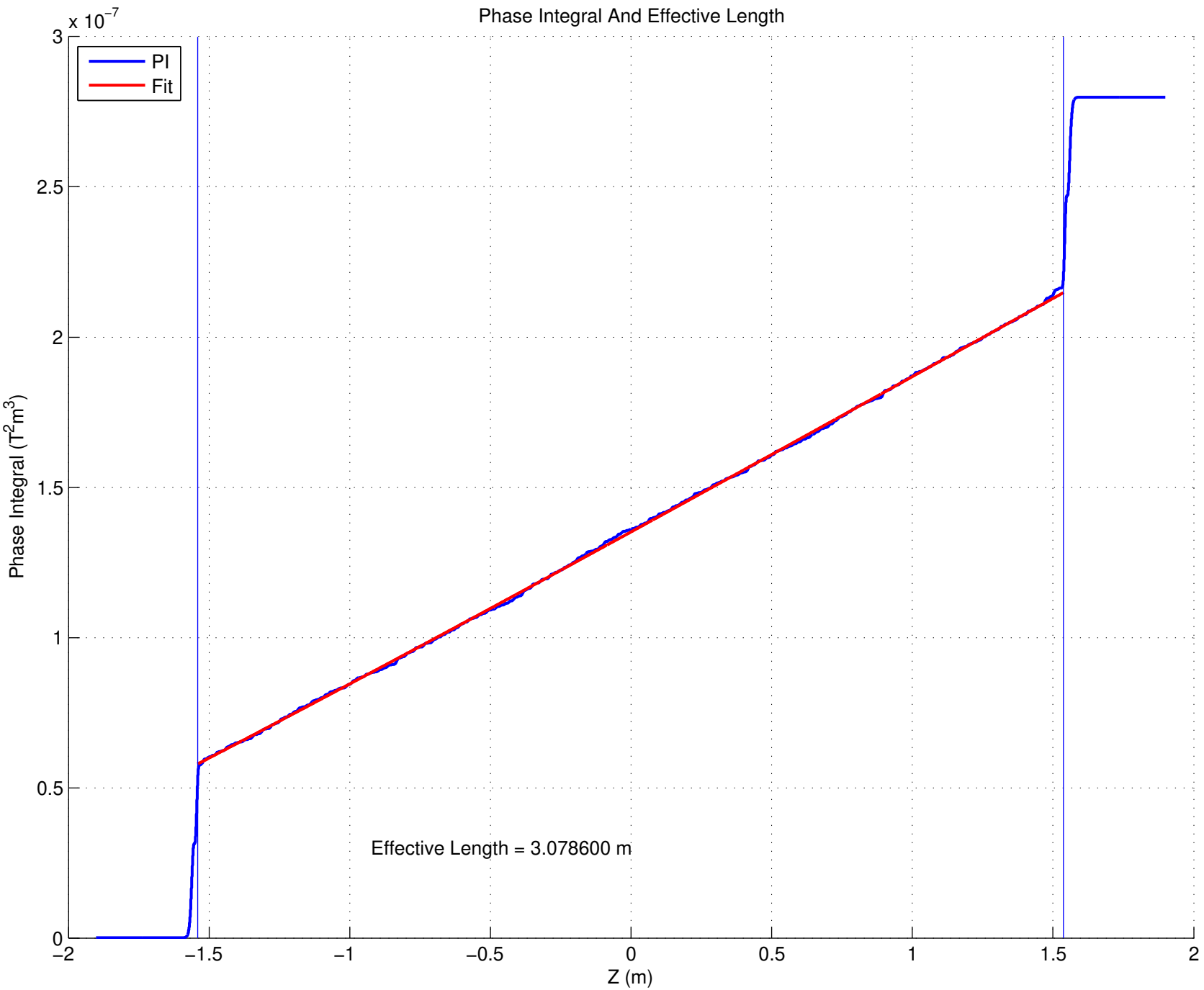

X Trajectory, Slope Corrected
x 10^-6
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
X Trajectory, Corrected (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

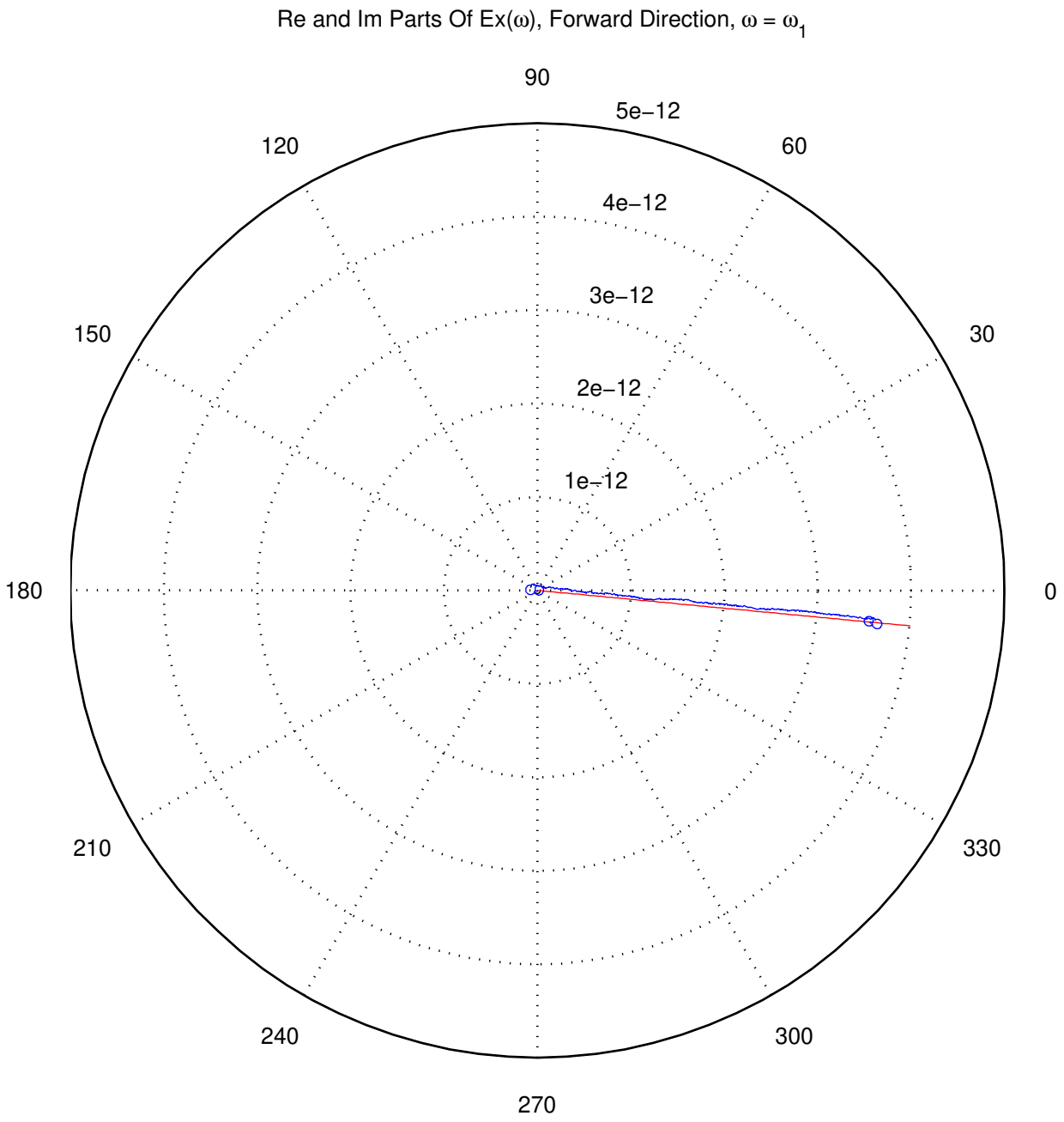

Y Trajectory, Slope Corrected
x 10^-6
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
Y Trajectory, Corrected (m)
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

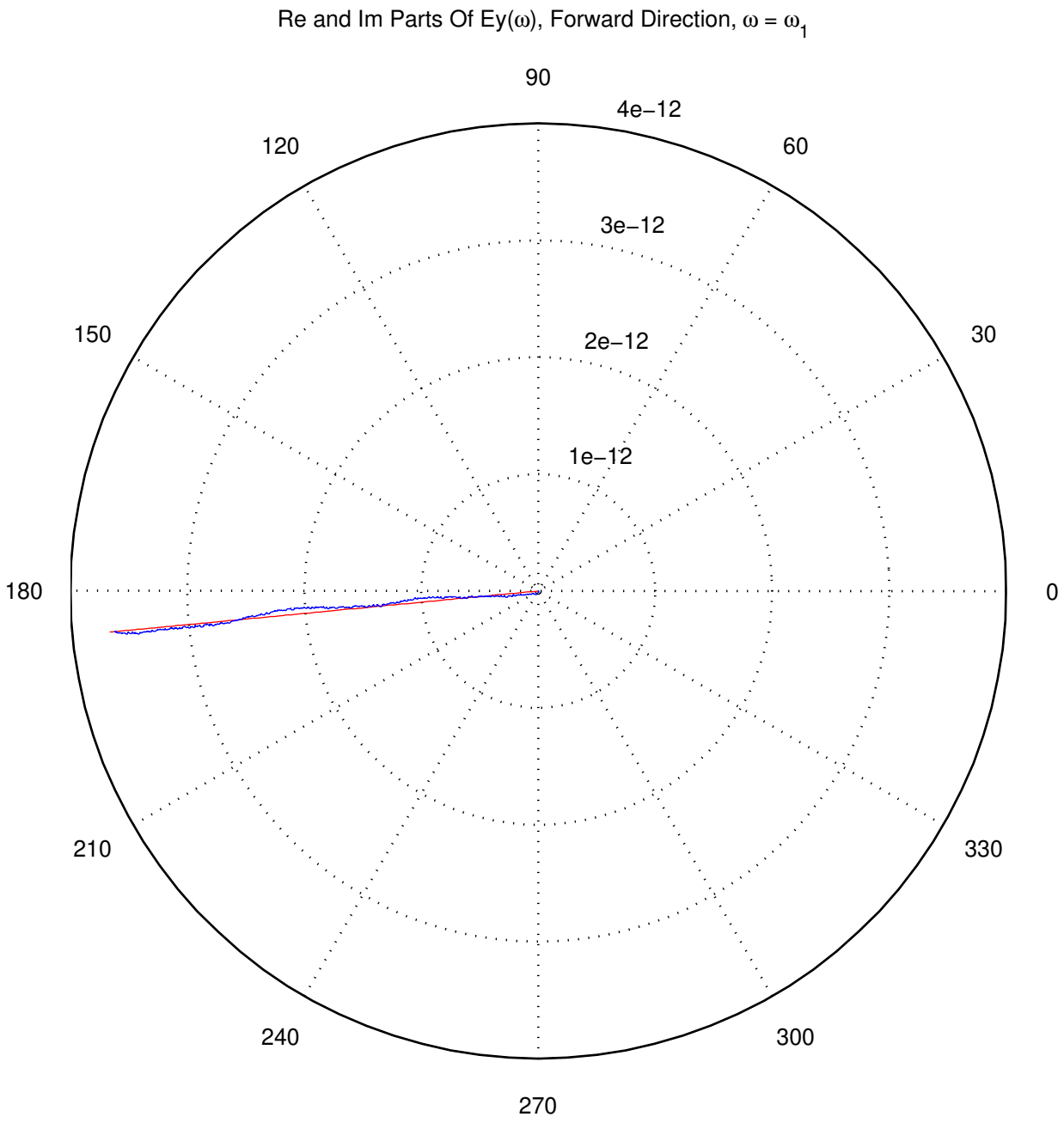

Phase Relative To Cell Entrance
Phase (rad)
800
700
600
500
400
300
200
100
0
−100
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z (m)

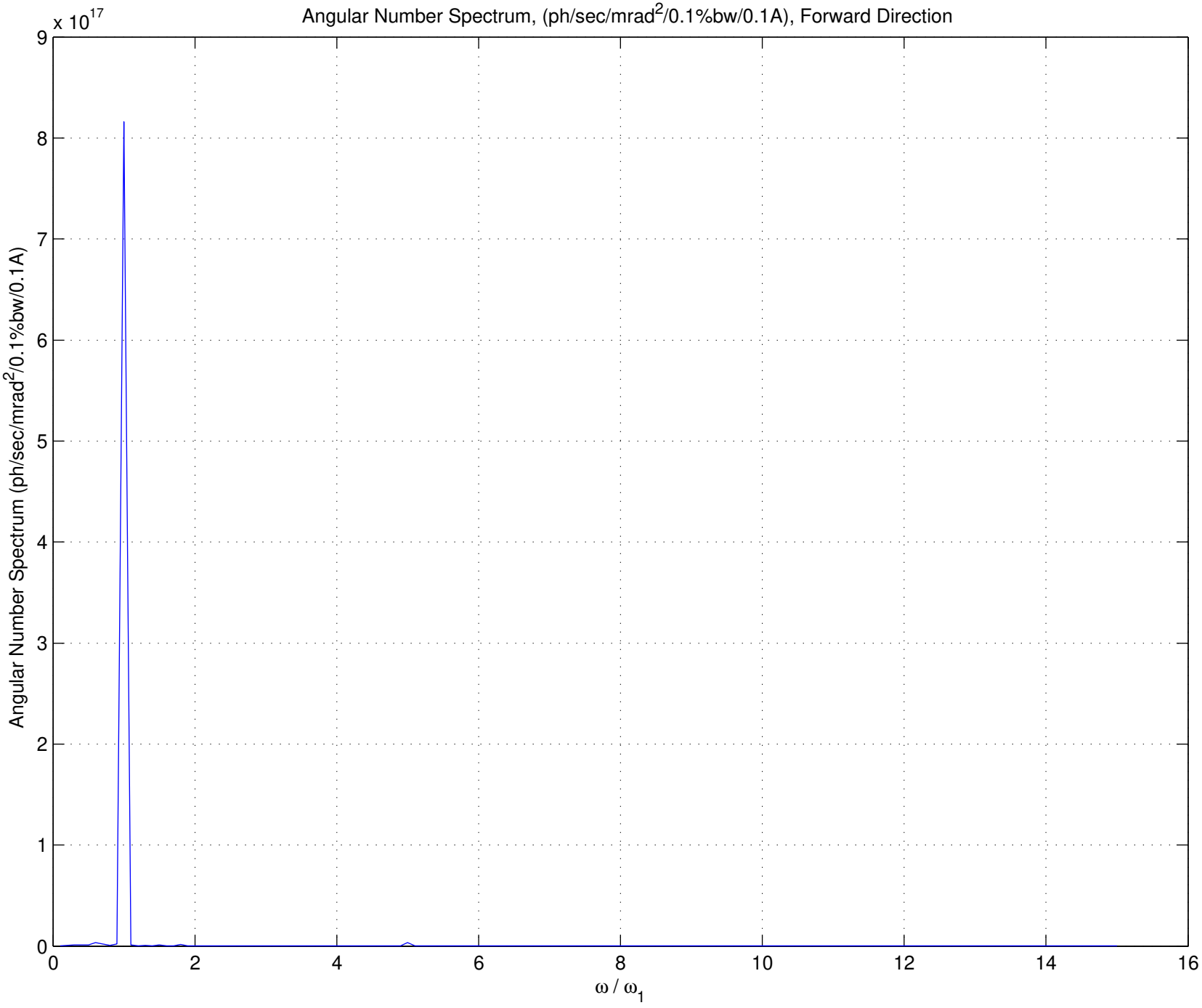

Phase Error At Field Peaks, No Ends
5
36
67
98
130
161
192
Pole
10
8
6
4
2
0
−2
−4
−6
−8
−10
Phase Error (deg)
Phase Error: Ave = 0.000000 deg, RMS = 2.514394 deg
−1.5
−1
−0.5
0
0.5
1
1.5
Z (m)

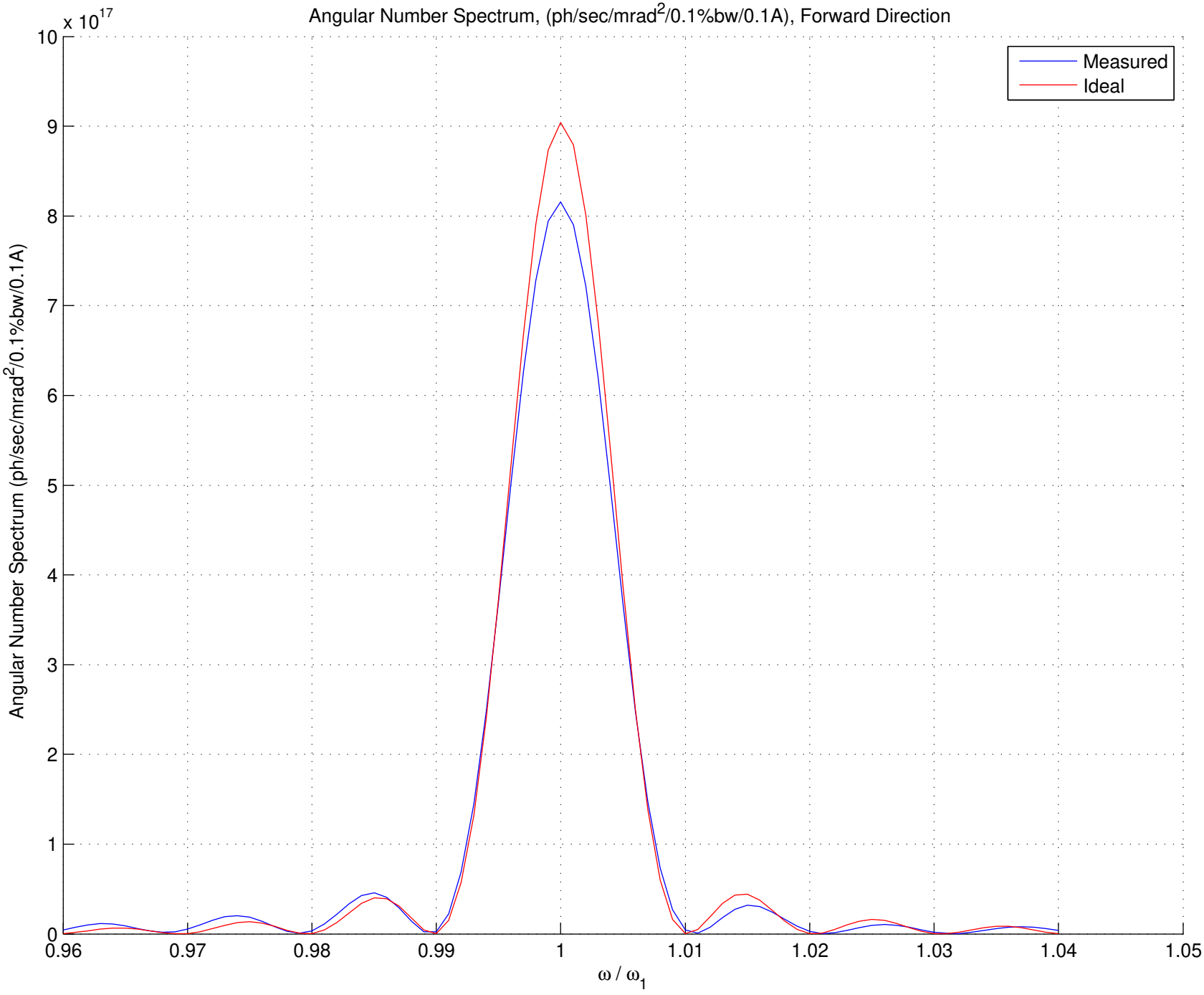

Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
Phase Error (deg)
Z (m)
Pole
5
36
67
98
130
161
192
420
410
400
390
380
370
360
350
340
−1.5
−1
−0.5
0
0.5
1
1.5

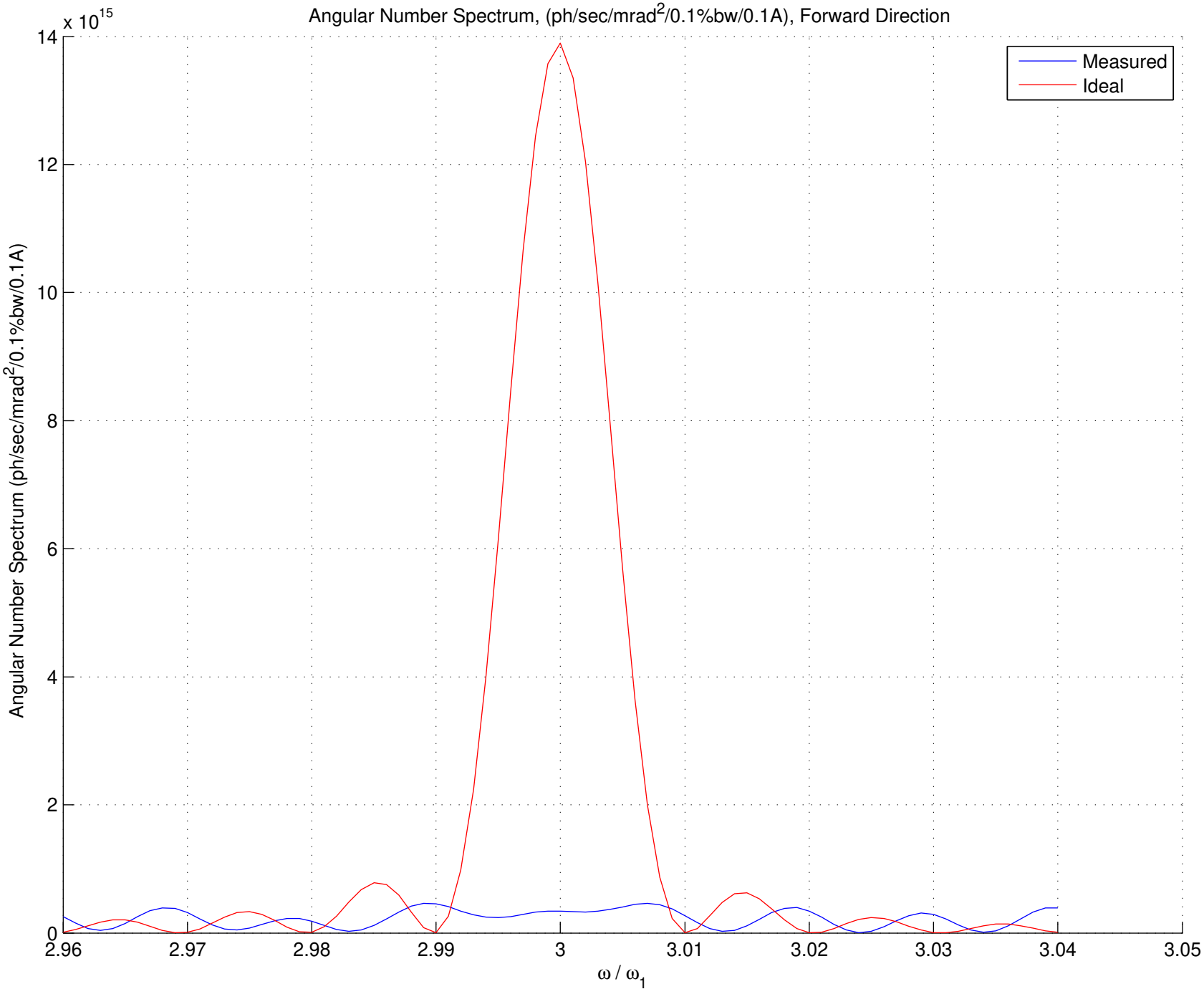

Phase Integral And Effective Length
x 10^-7
PI
Fit
Phase Integral (T^2m^3)
Z (m)
Effective Length = 3.078600 m
3
2.5
2
1.5
1
0.5
0
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2

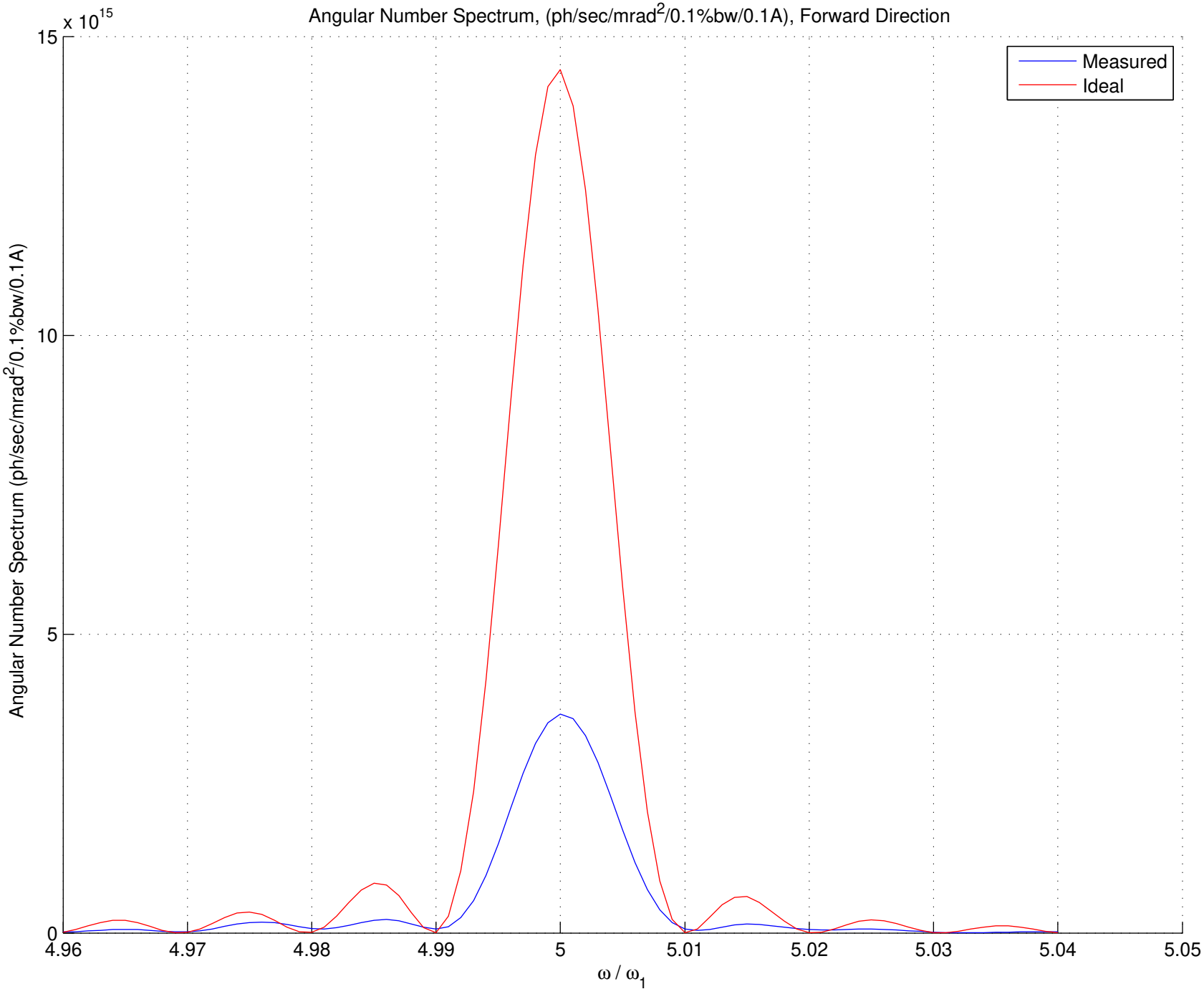

Re and Im Parts Of Ex(ω), Forward Direction, ω = ω1
90
5e−12
120
60
4e−12
3e−12
150
30
2e−12
1e−12
180
0
210
330
240
300
270


Re and Im Parts Of Ey(ω), Forward Direction, ω = ω1
90
4e−12
120
60
3e−12
150
30
2e−12
1e−12
180
0
210
330
240
300
270


Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
x 10^17
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
ω / ω1
0
1
2
3
4
5
6
7
8
9
0
2
4
6
8
10
12
14
16


Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
x 10^17
10
9
8
7
6
5
4
3
2
1
0
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
Measured
Ideal
0.96
0.97
0.98
0.99
1
1.01
1.02
1.03
1.04
1.05
ω / ω1


Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
x 10^15
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
ω / ω1
Measured
Ideal
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 10^15
15
10
5
0
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
4.96
4.97
4.98
4.99
5
5.01
5.02
5.03
5.04
5.05
ω / ω1
Measured
Ideal