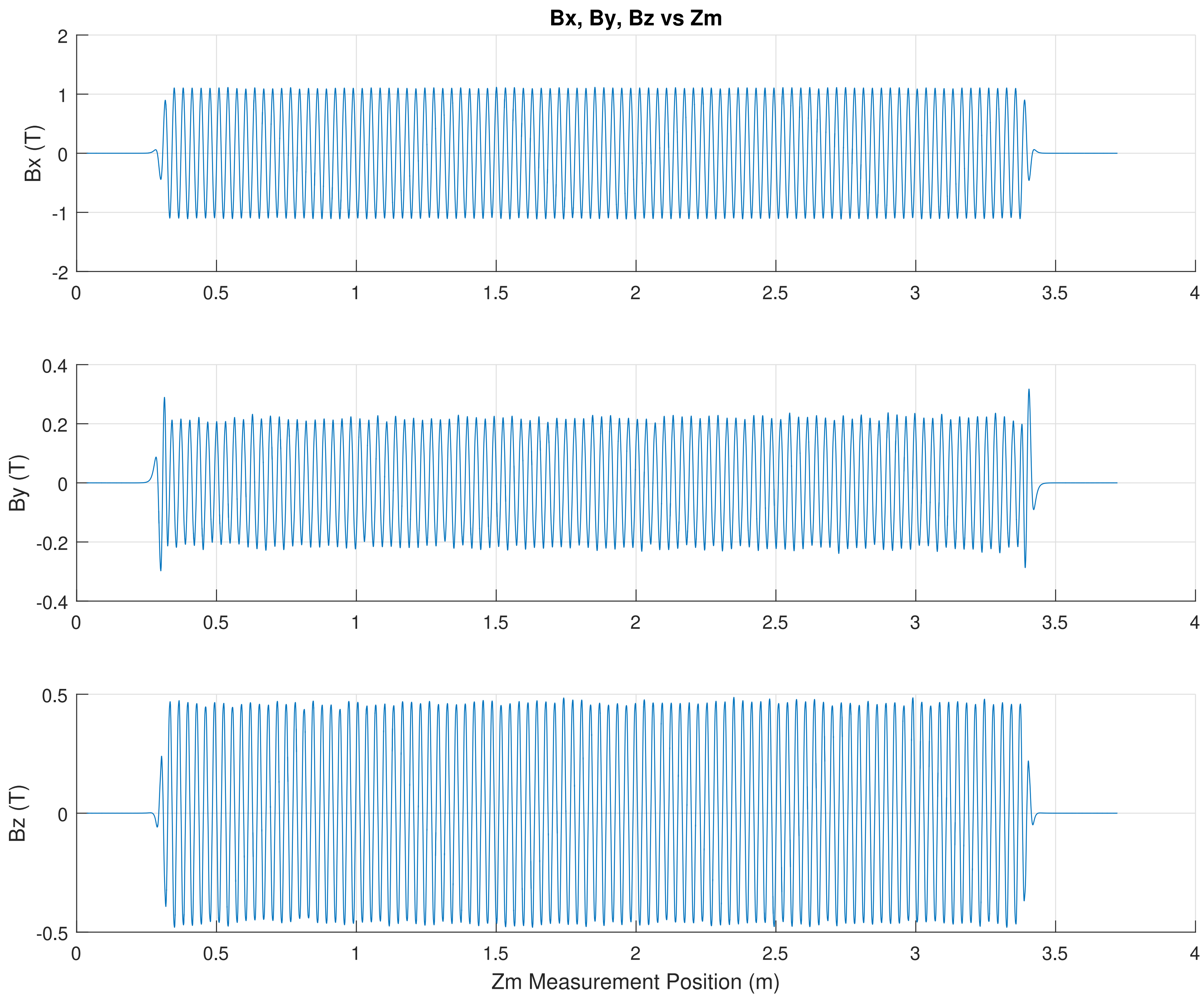
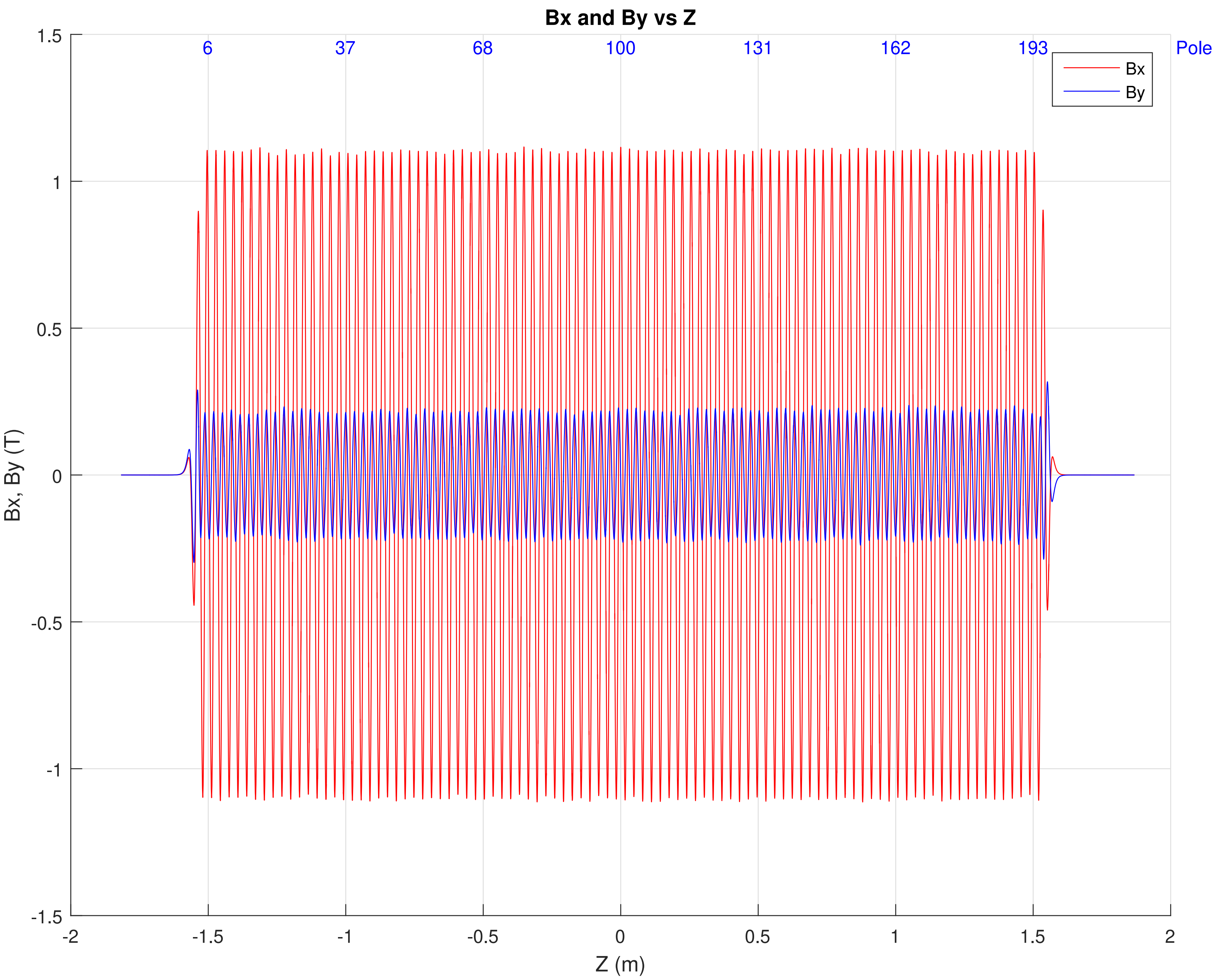
SLAC Magnetic Measurements

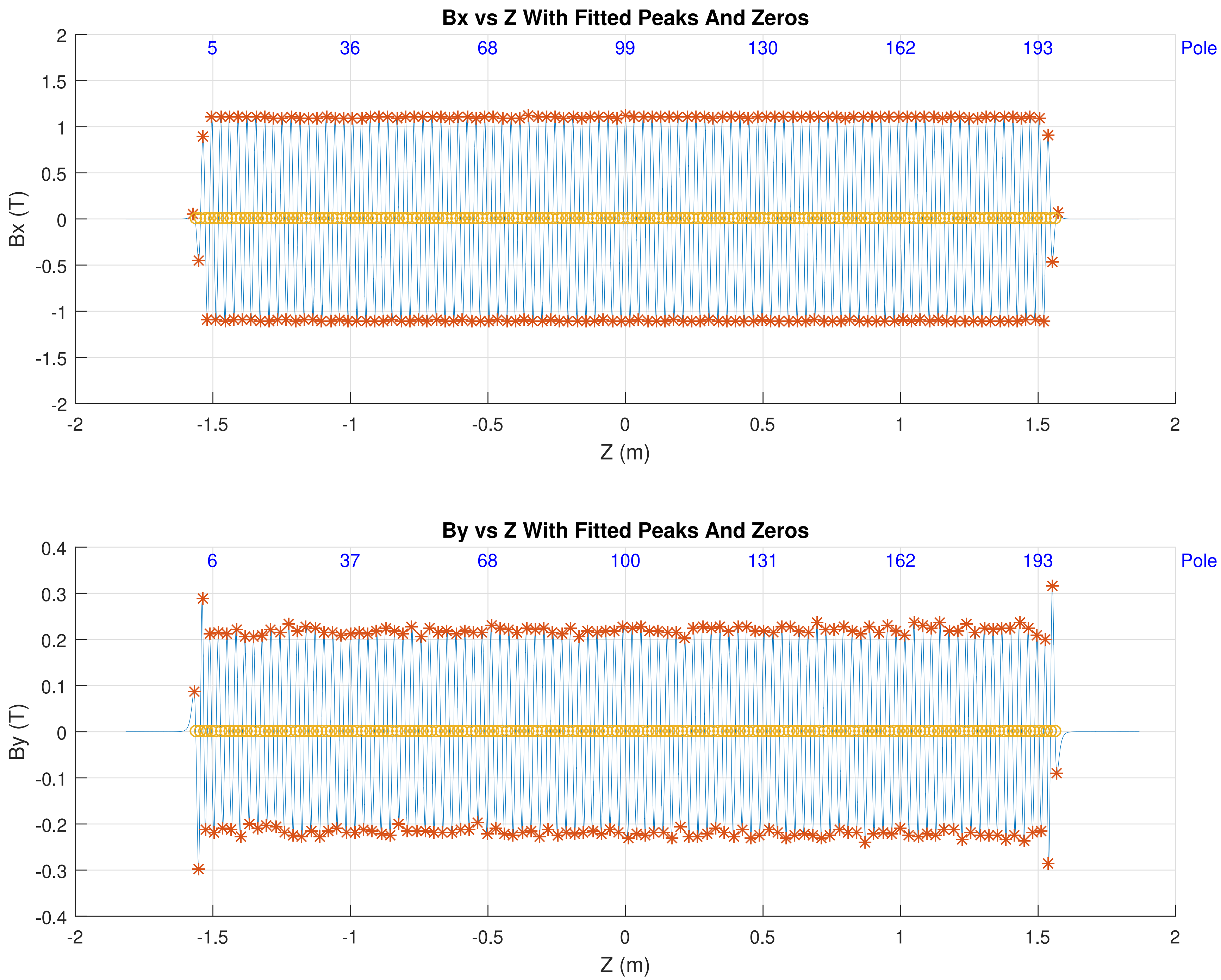
EPU Analysis

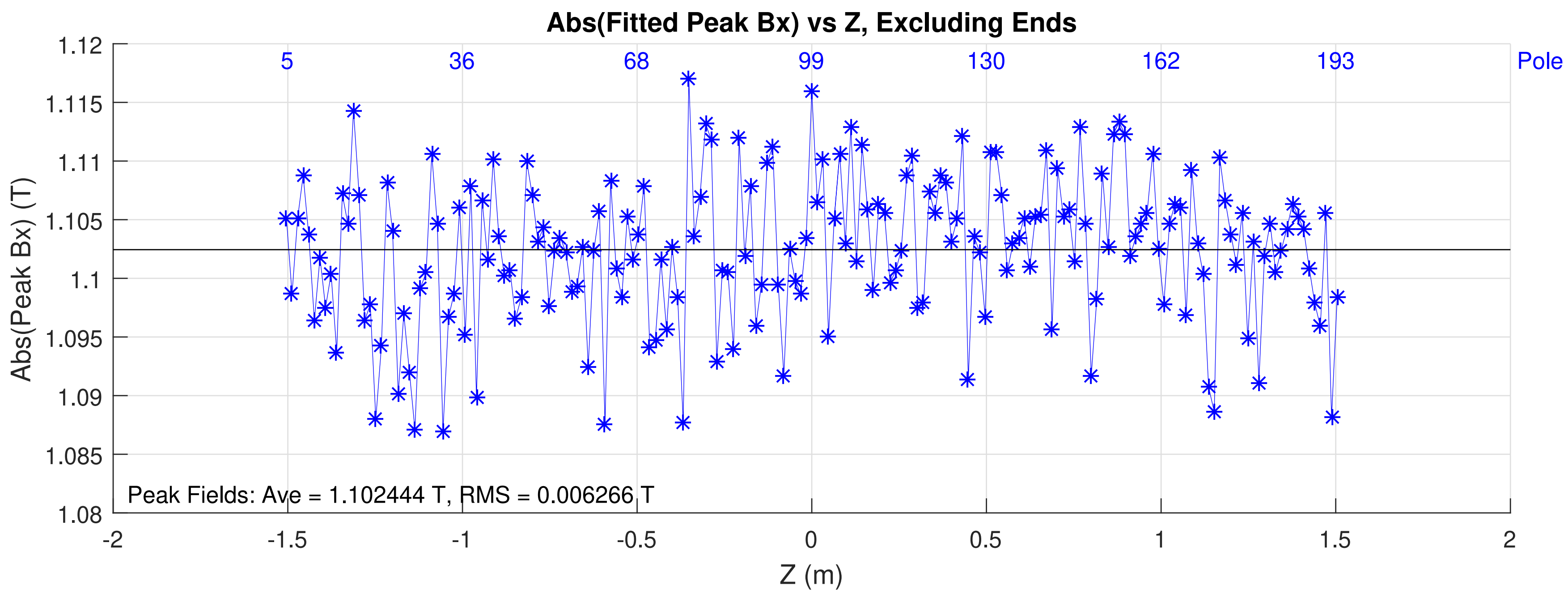
Parameters:
INPUT-FILE-DIR =V:\MET\MagServe\MagData\DELTA\Delta Data 2015\New Measurements\Run 137 HD Spreadsheet 260 Meas\\N082 Elliptical Scan Mode-18 Kd3.3314 Kind 2\
INPUT-FILE-NAME =hall2-anal-probe1-field.dat
INPUT-FILE-TYPE =ZBXYZH
CORR-REQUIRED =0
GAMMA =26671.59
NOM-LAMBDA-U =0
NOM-K-VALUE =0
NOM-LAMBDA-R =0
NUM-POLES =196
NUM-END-POLES =4
CELL-LENGTH =3.656

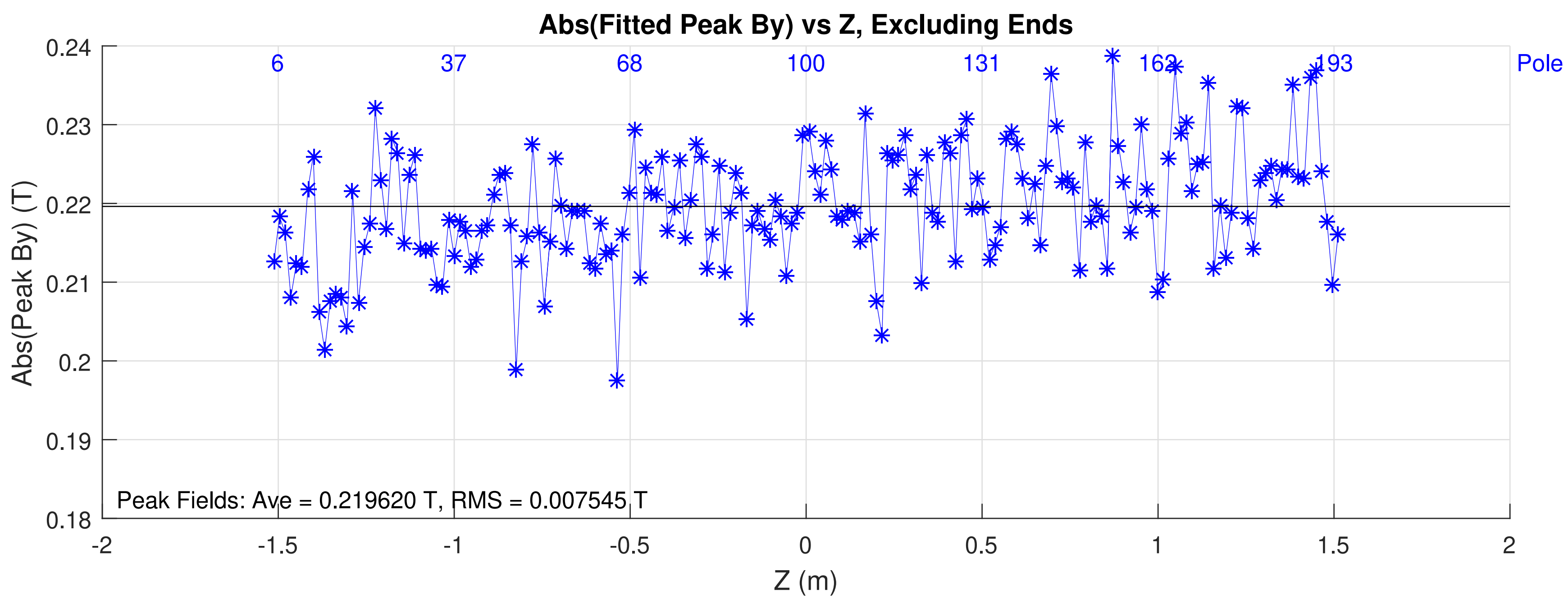

Bx, By, Bz vs Zm
Bx (T)
By (T)
Bz (T)
2
1
0
-1
-2
0.4
0.2
-0.2
-0.4
0.5
-0.5
0
0.5
1
1.5
2
2.5
3
3.5
4
Zm Measurement Position (m)

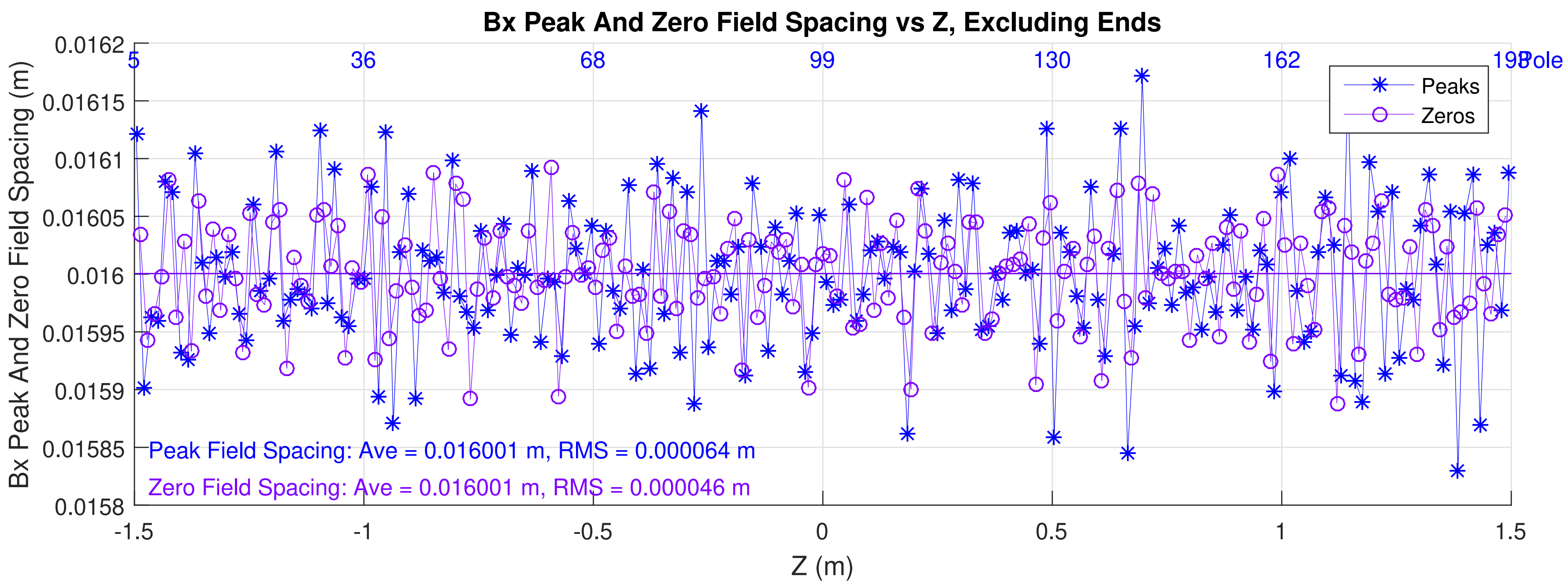


Bx and By vs Z
6
37
68
100
131
162
193
Pole
Bx
By
Bx, By (T)
Z (m)
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

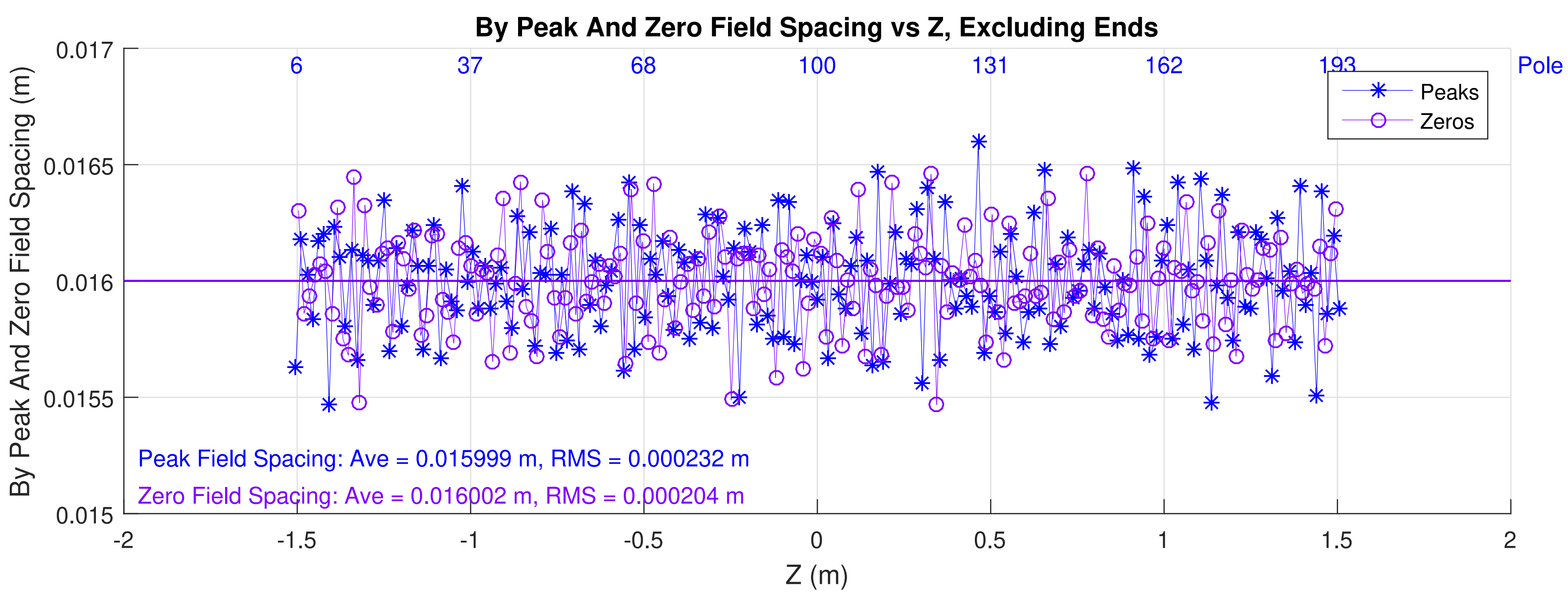

Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
Pole
5
36
68
99
130
162
193
By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
Pole
6
37
68
100
131
162
193


Abs(Fitted Peak Bx) vs Z, Excluding Ends
Abs(Peak Bx) (T)
Z (m)
Pole
5
36
68
99
130
162
193
1.12
1.115
1.11
1.105
1.1
1.095
1.09
1.085
1.08
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Peak Fields: Ave = 1.102444 T, RMS = 0.006266 T

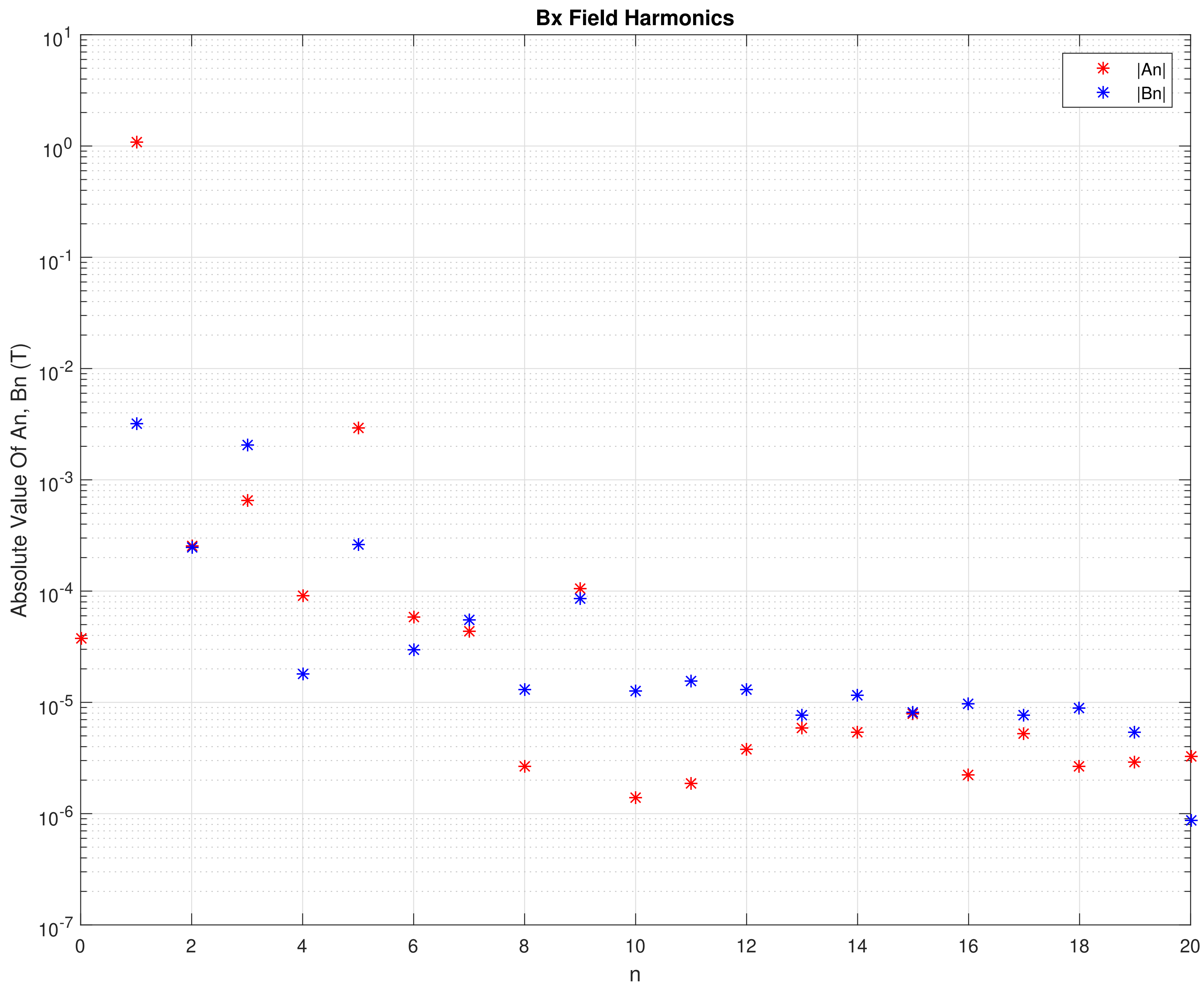

Abs(Fitted Peak By) vs Z, Excluding Ends
Abs(Peak By) (T)
Z (m)
Pole
6
37
68
100
131
162
193
0.24
0.23
0.22
0.21
0.2
0.19
0.18
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Peak Fields: Ave = 0.219620 T, RMS = 0.007545 T



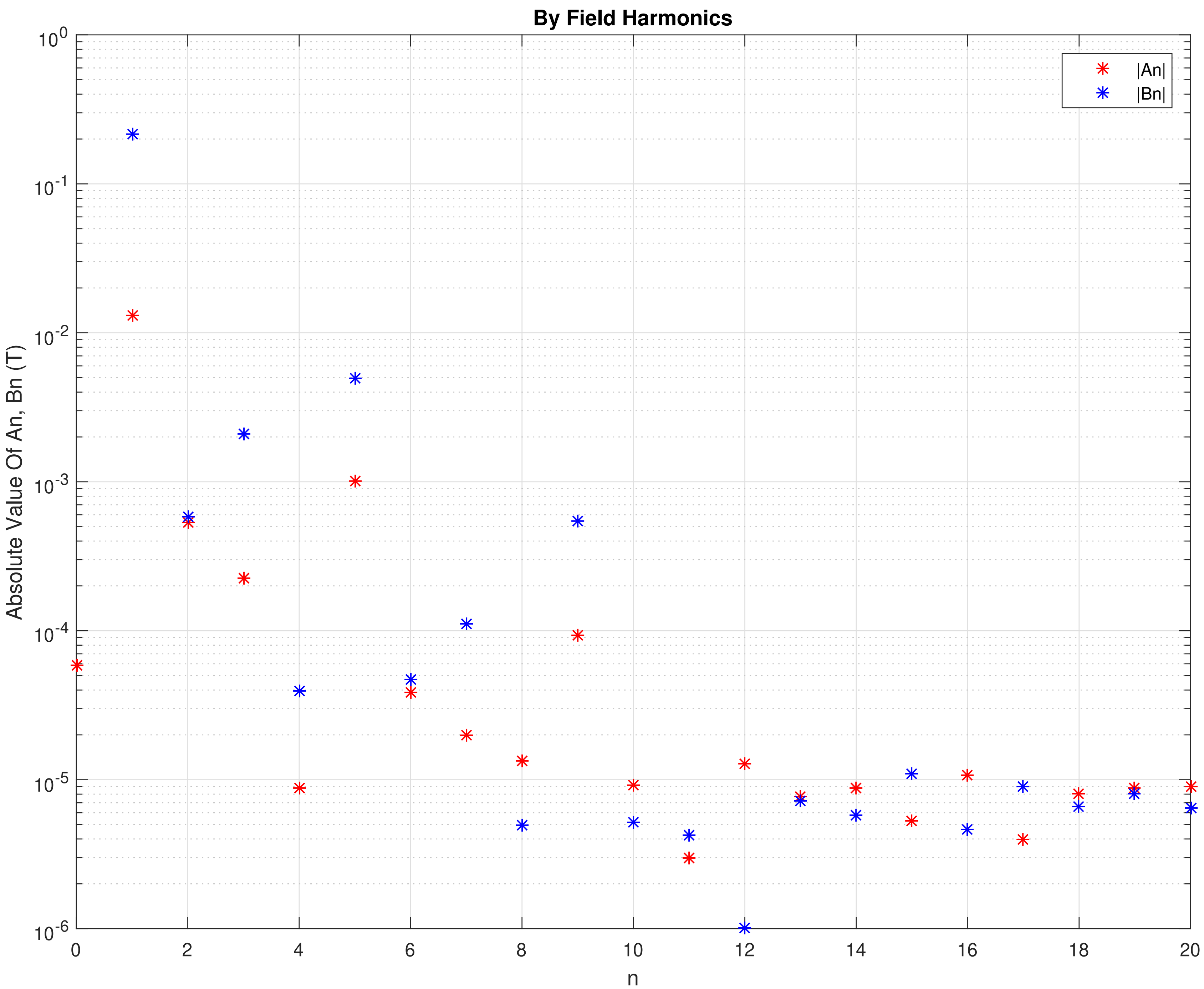
Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.016001 m, RMS = 0.000064 m
Zero Field Spacing: Ave = 0.016001 m, RMS = 0.000046 m



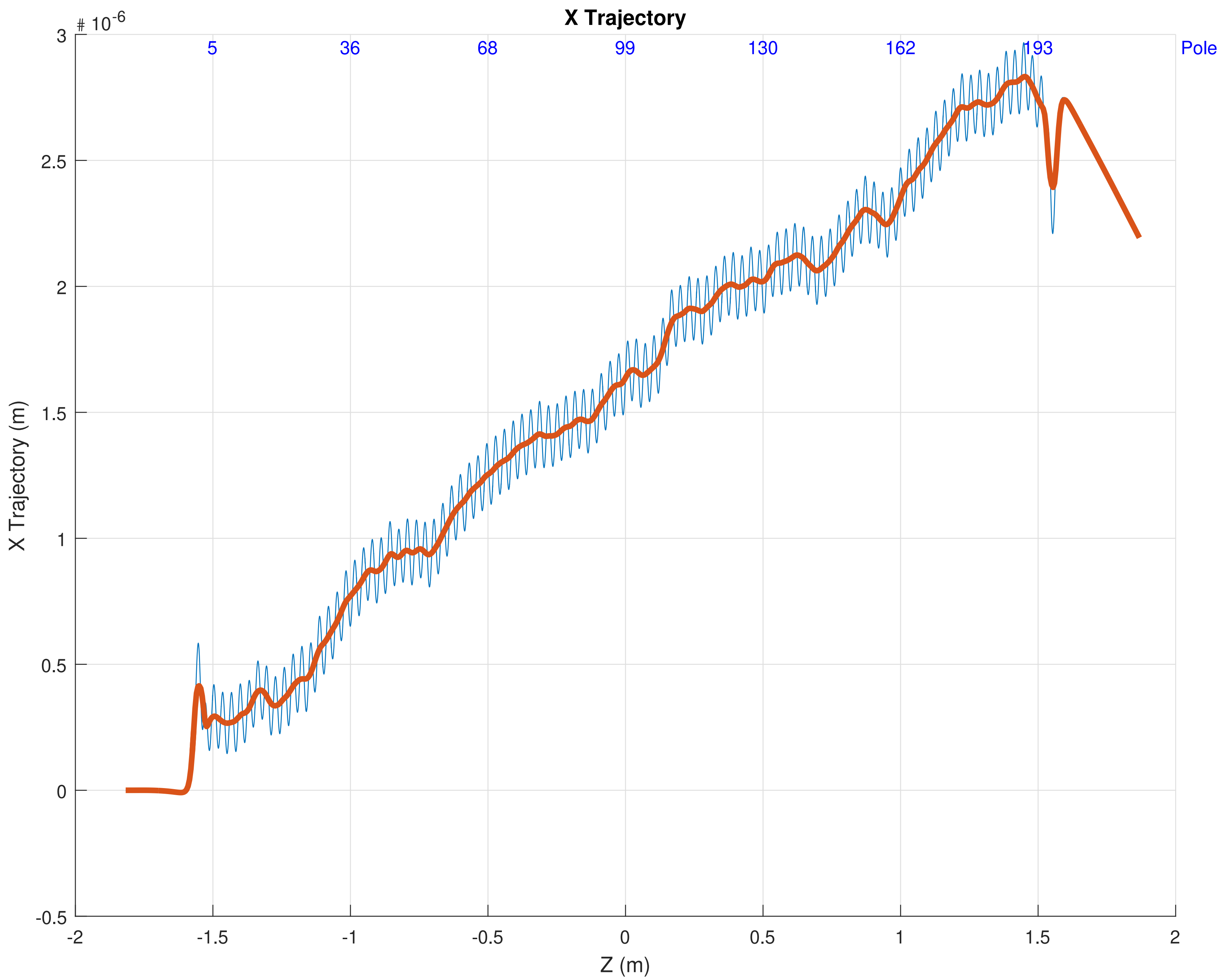
By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.015999 m, RMS = 0.000232 m
Zero Field Spacing: Ave = 0.016002 m, RMS = 0.000204 m

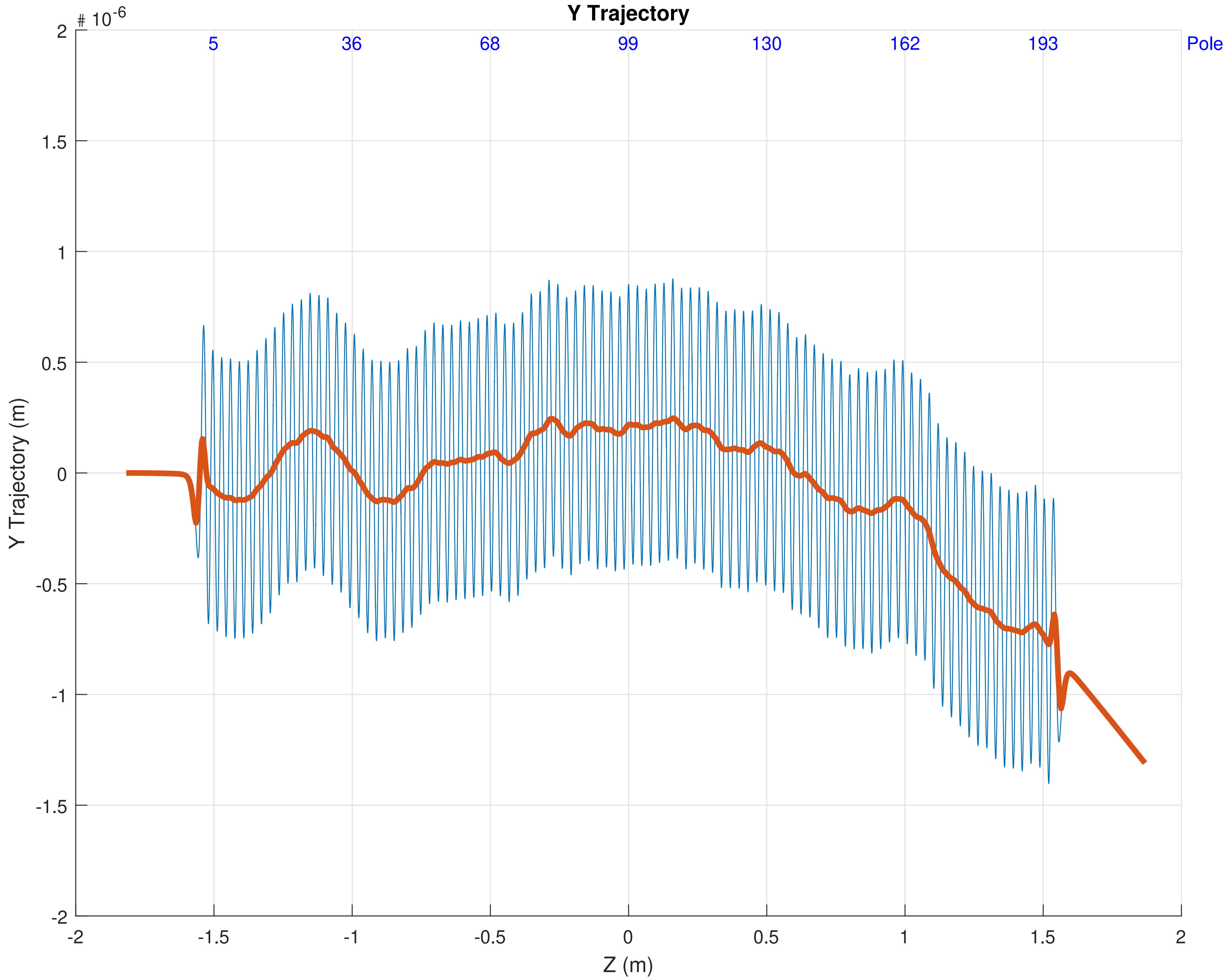


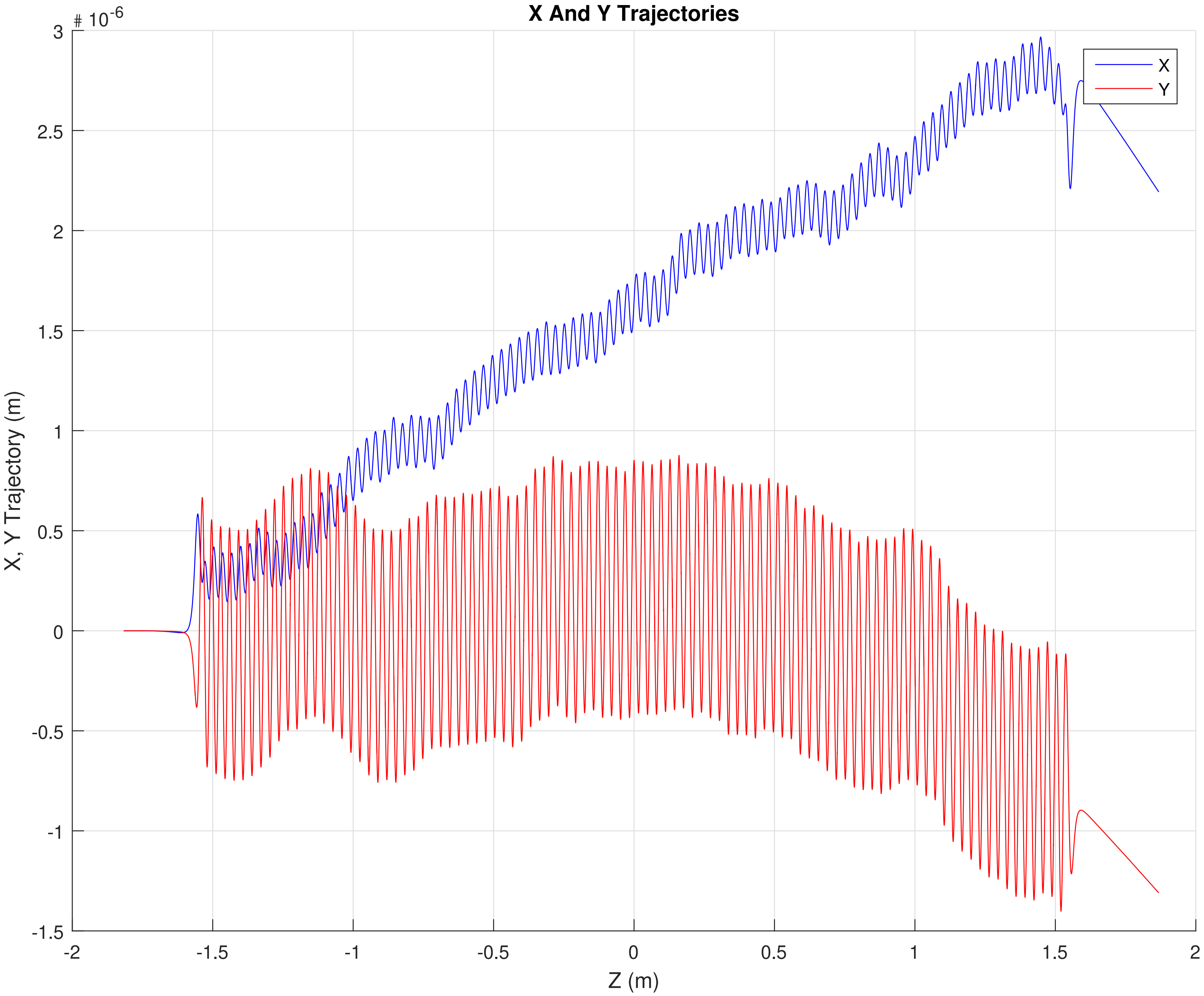
Bx Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n

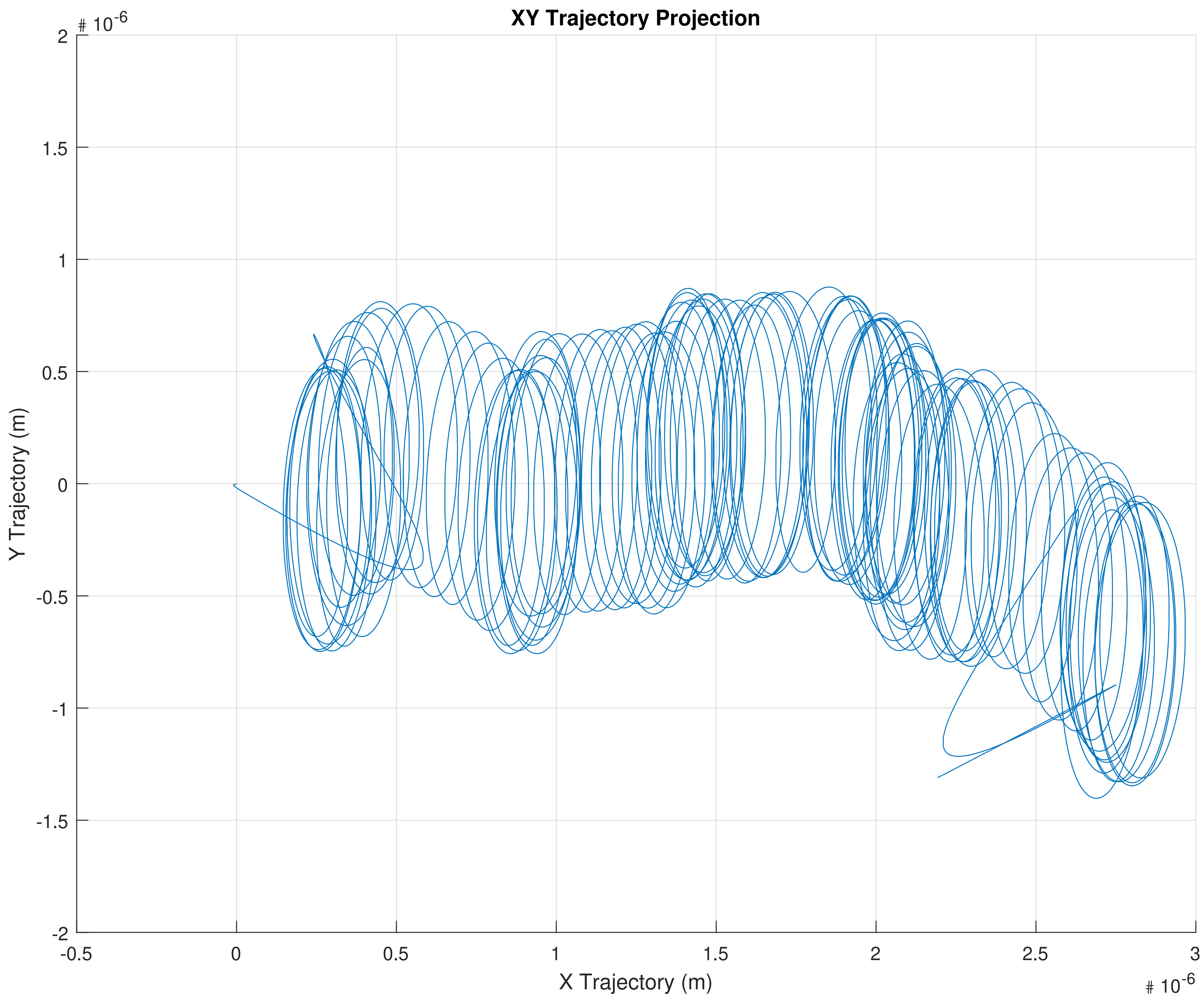


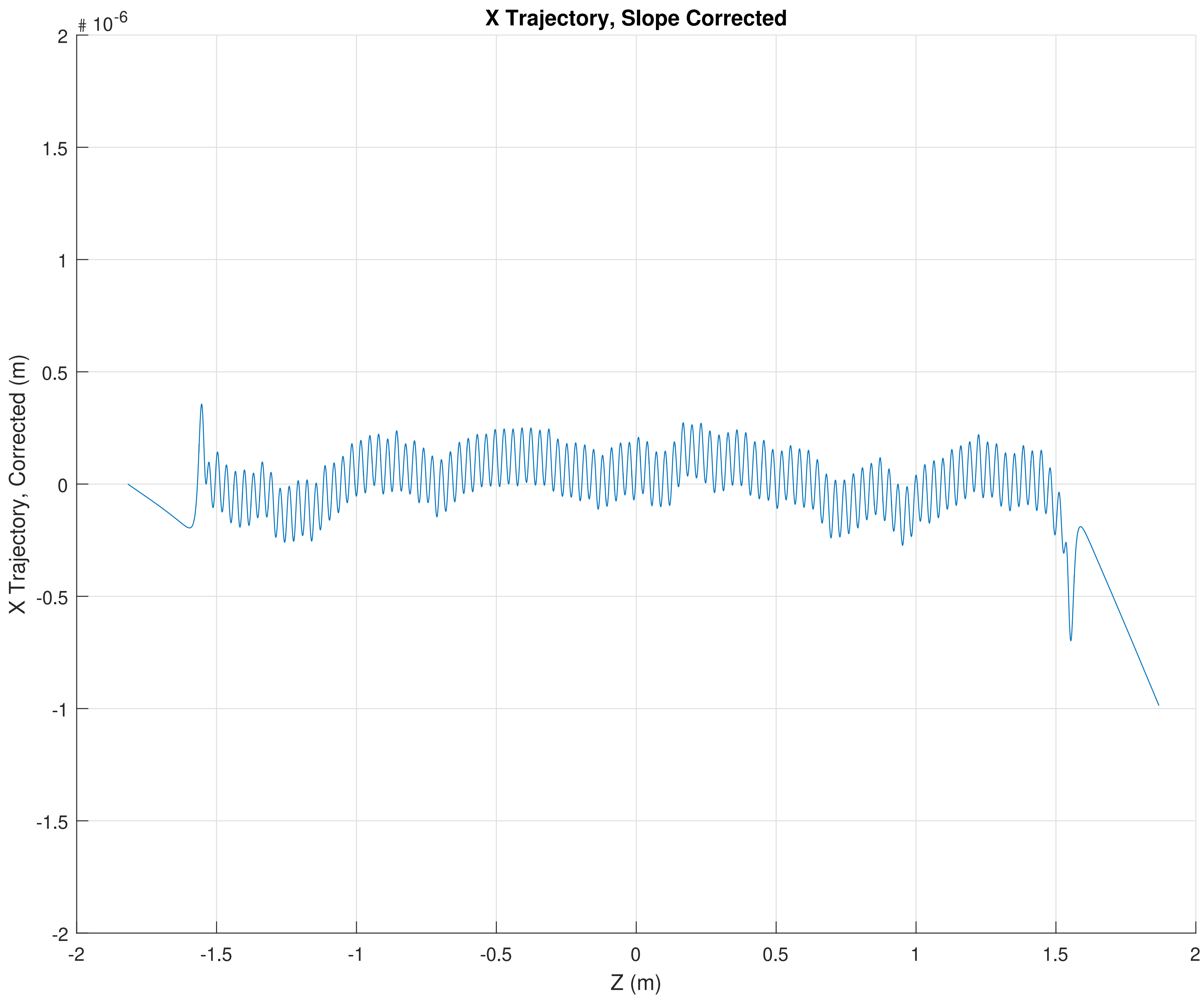
By Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
0
2
4
6
8
10
12
14
16
18
20

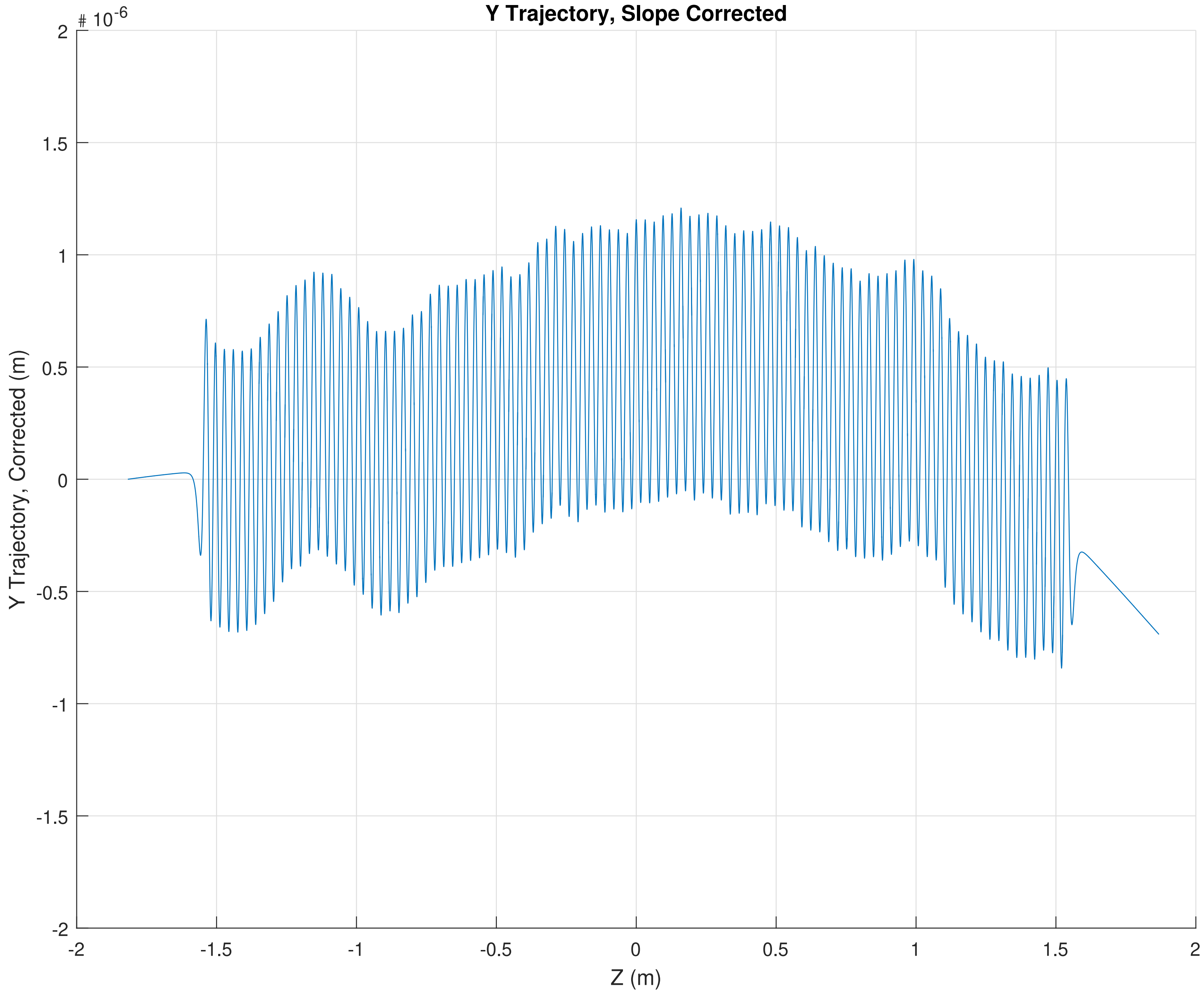

X Trajectory
10^-6
X Trajectory (m)
Z (m)
5
36
68
99
130
162
193
Pole
3
2.5
2
1.5
1
0.5
0
-0.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2


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

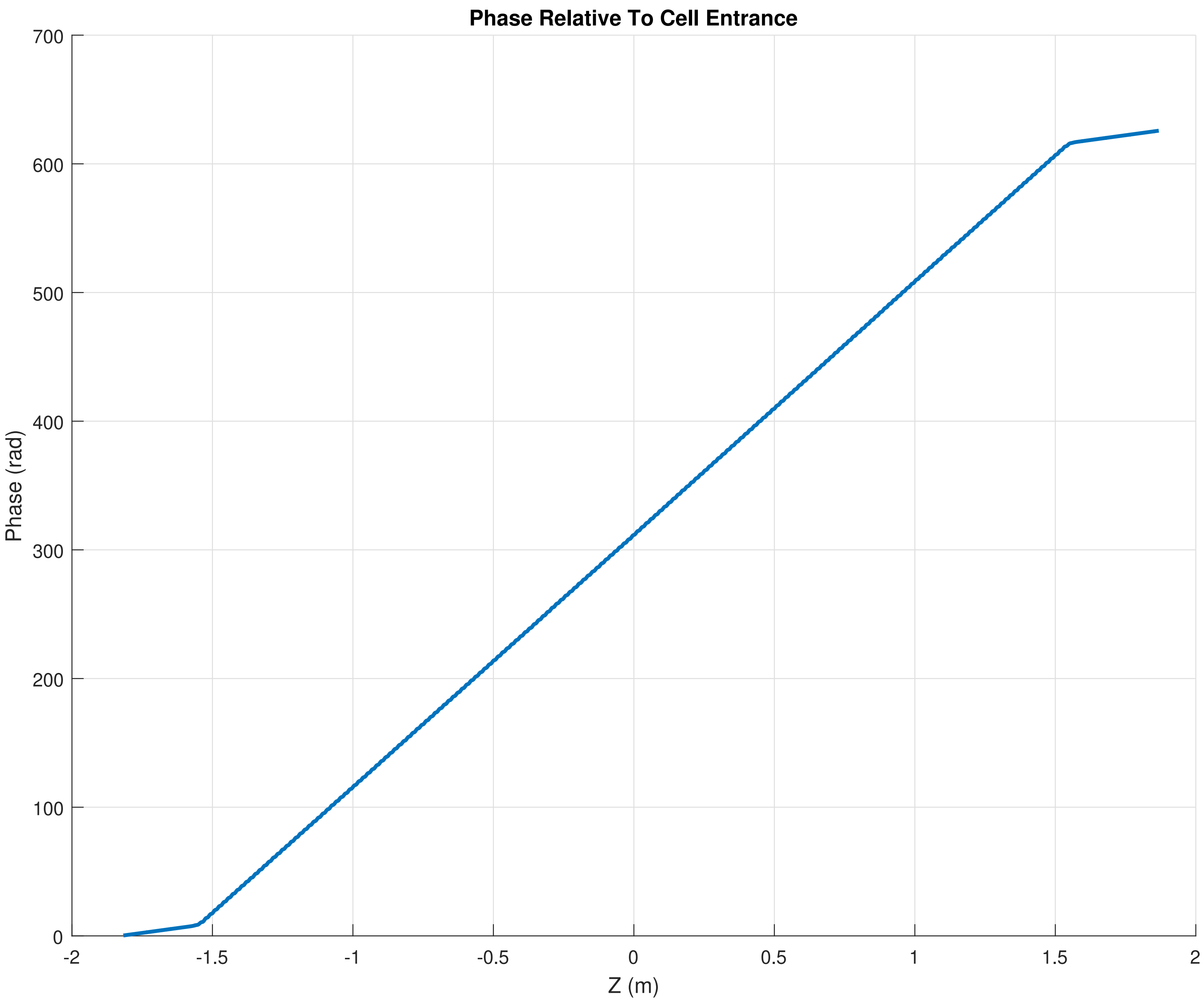

X And Y Trajectories
10^-6
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
X, Y Trajectory (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)
X
Y


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

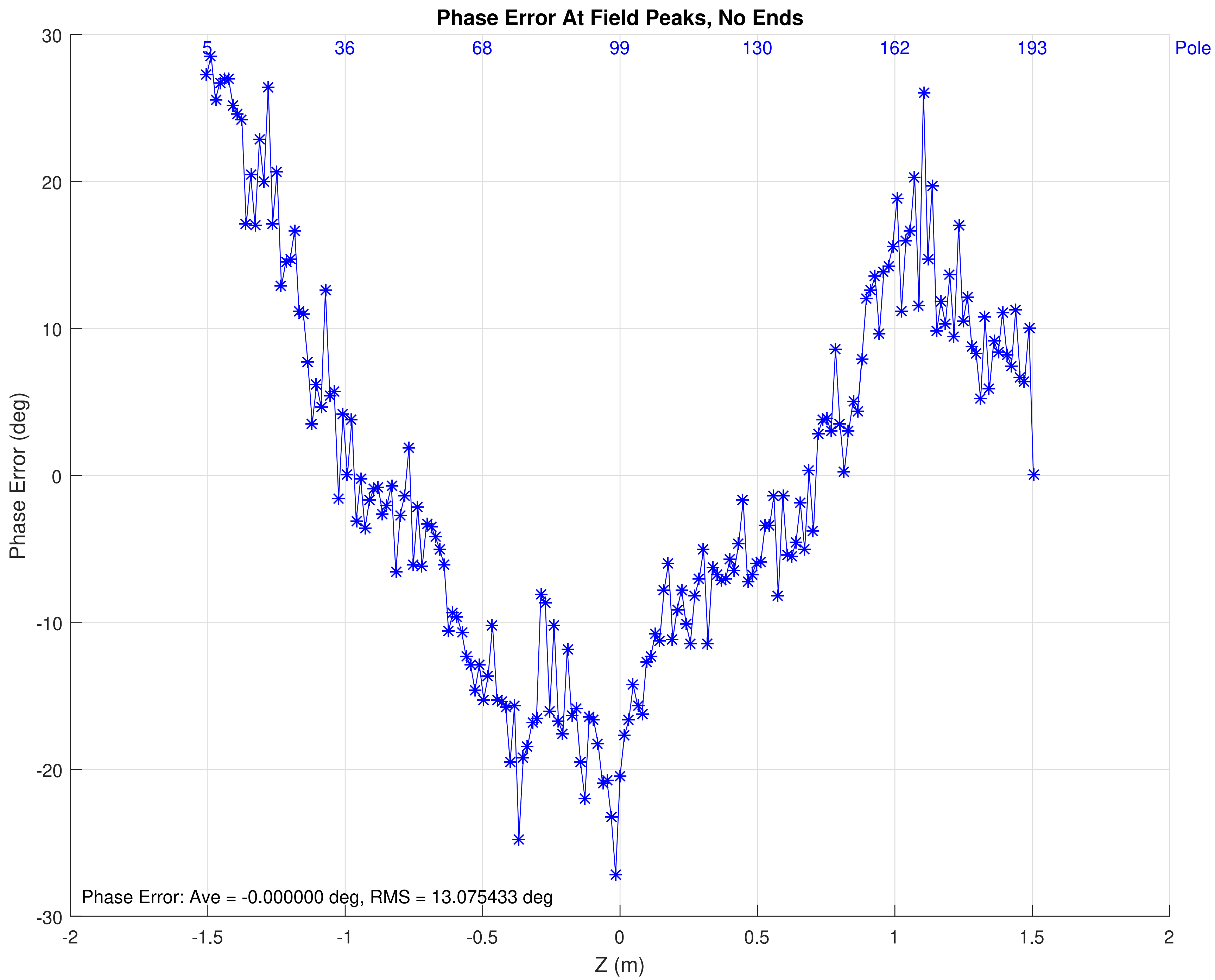

X Trajectory, Slope Corrected
10^-6
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
X Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

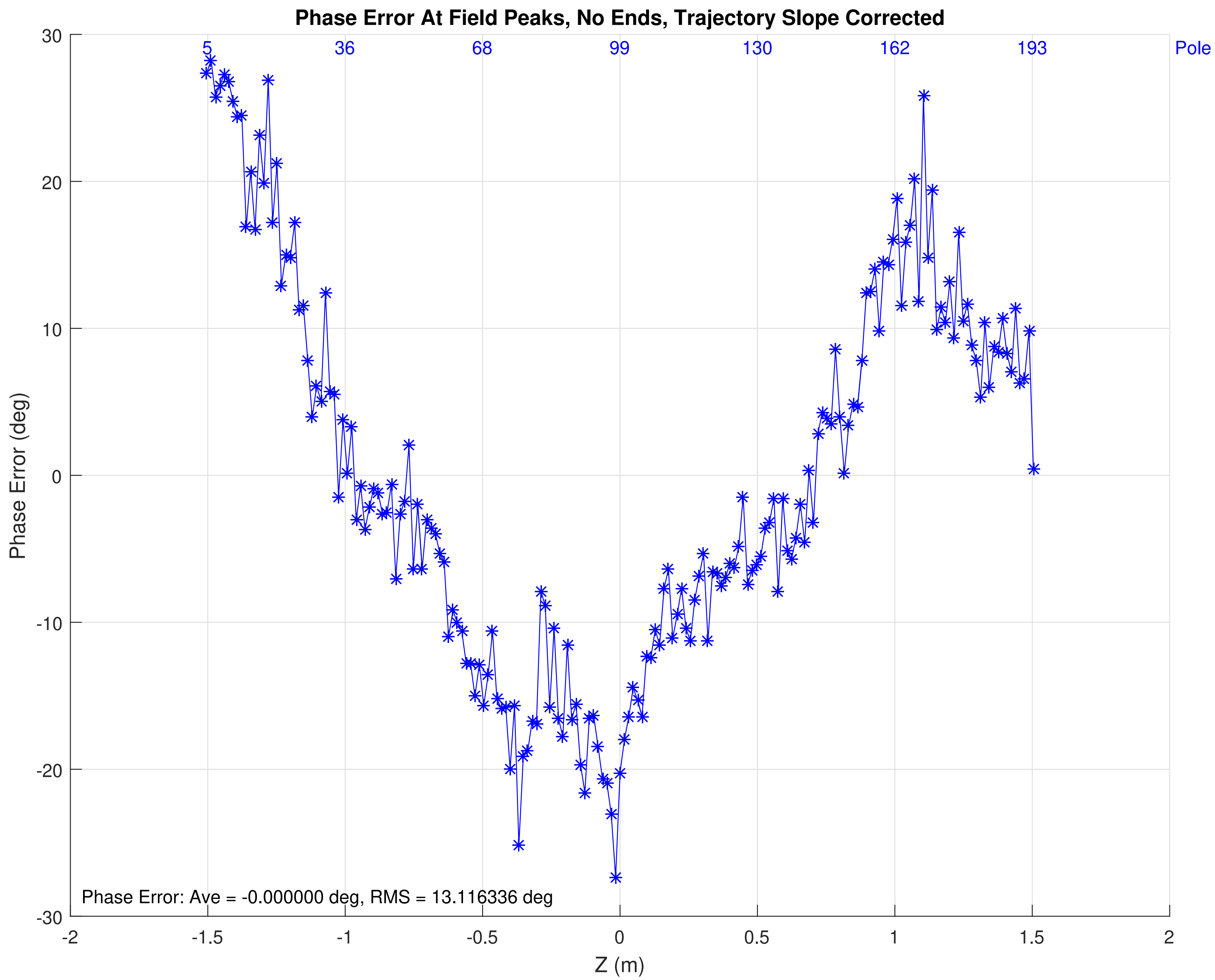


Y Trajectory, Slope Corrected
10-6
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
Y Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

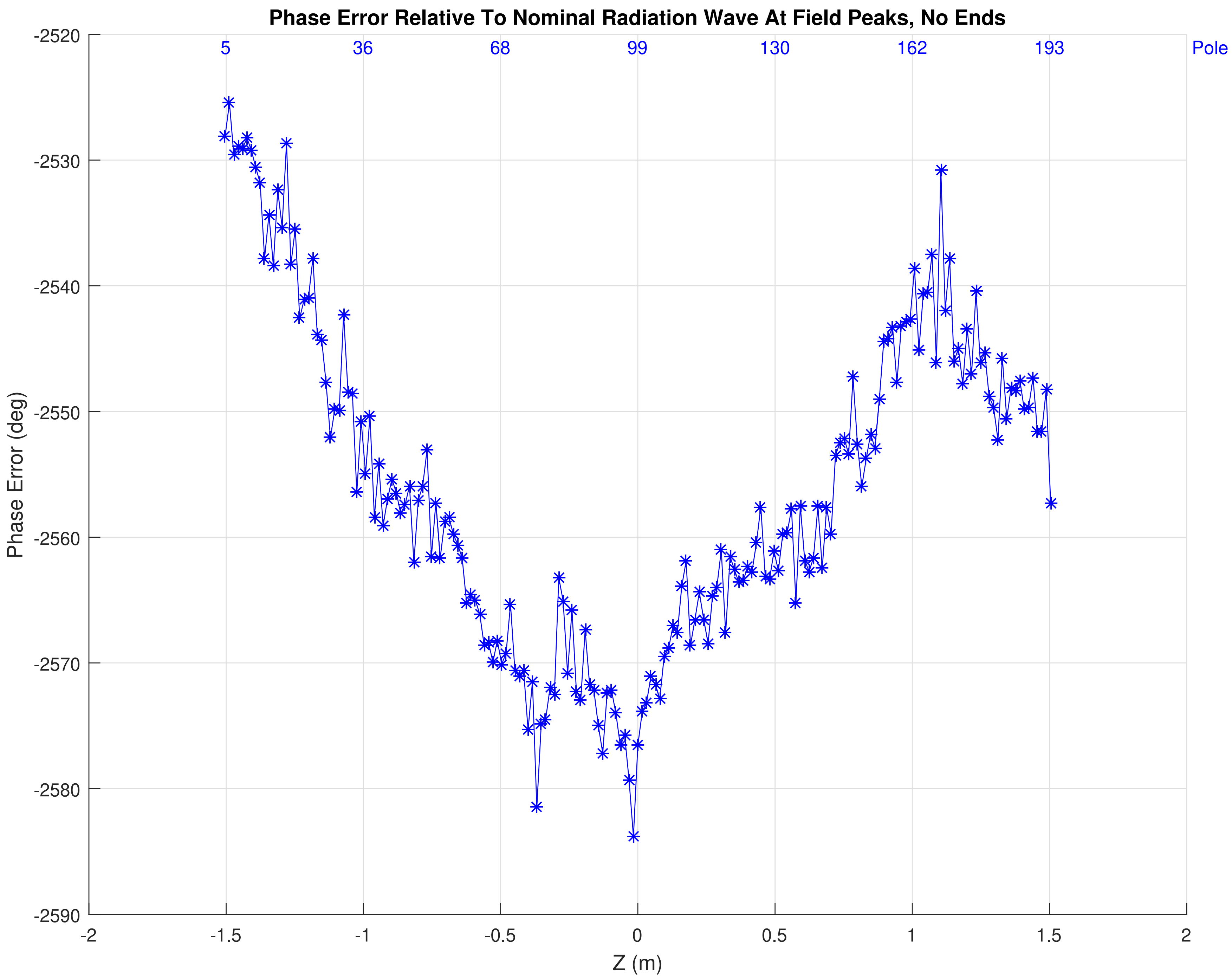


Phase Relative To Cell Entrance
700
600
500
400
300
200
100
0
Phase (rad)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

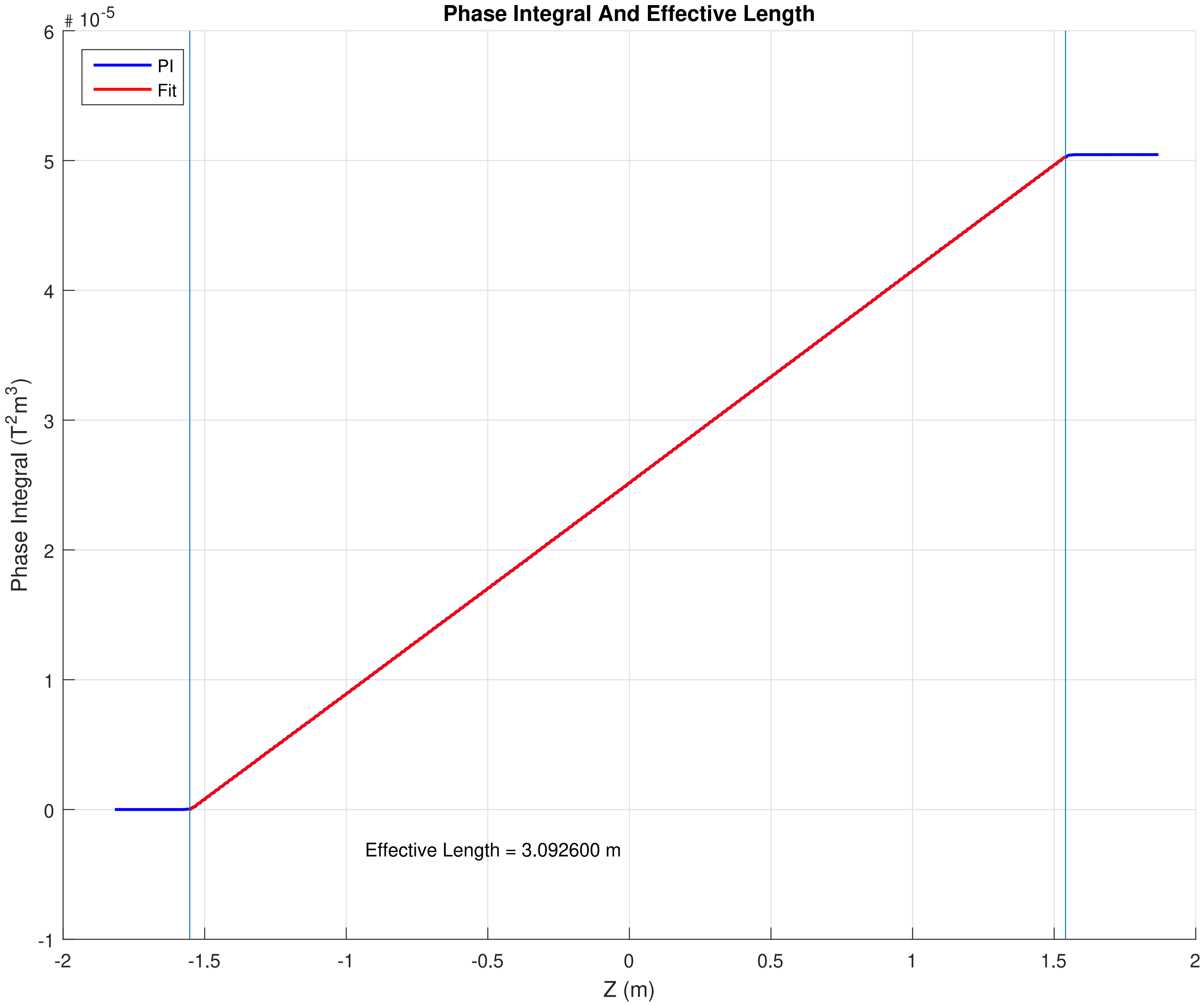

Phase Error At Field Peaks, No Ends
5
36
68
99
130
162
193
Pole
Phase Error (deg)
Z (m)
Phase Error: Ave = -0.000000 deg, RMS = 13.075433 deg
30
20
10
0
-10
-20
-30
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2



Phase Error At Field Peaks, No Ends, Trajectory Slope Corrected
5
36
68
99
130
162
193
Pole
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 = 13.116336 deg

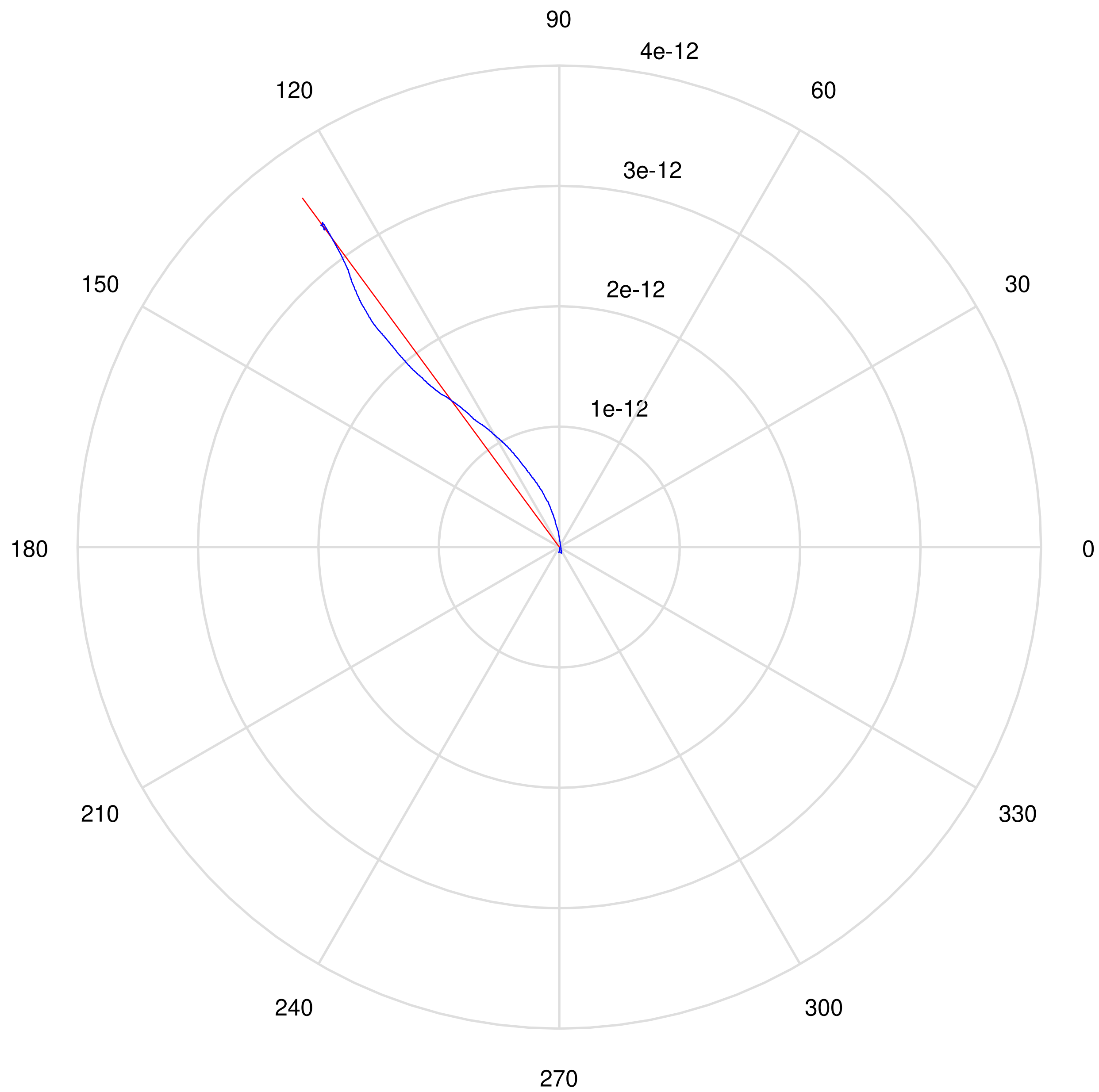


Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
5
36
68
99
130
162
193
Pole
-2520
-2530
-2540
-2550
-2560
-2570
-2580
-2590
Phase Error (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

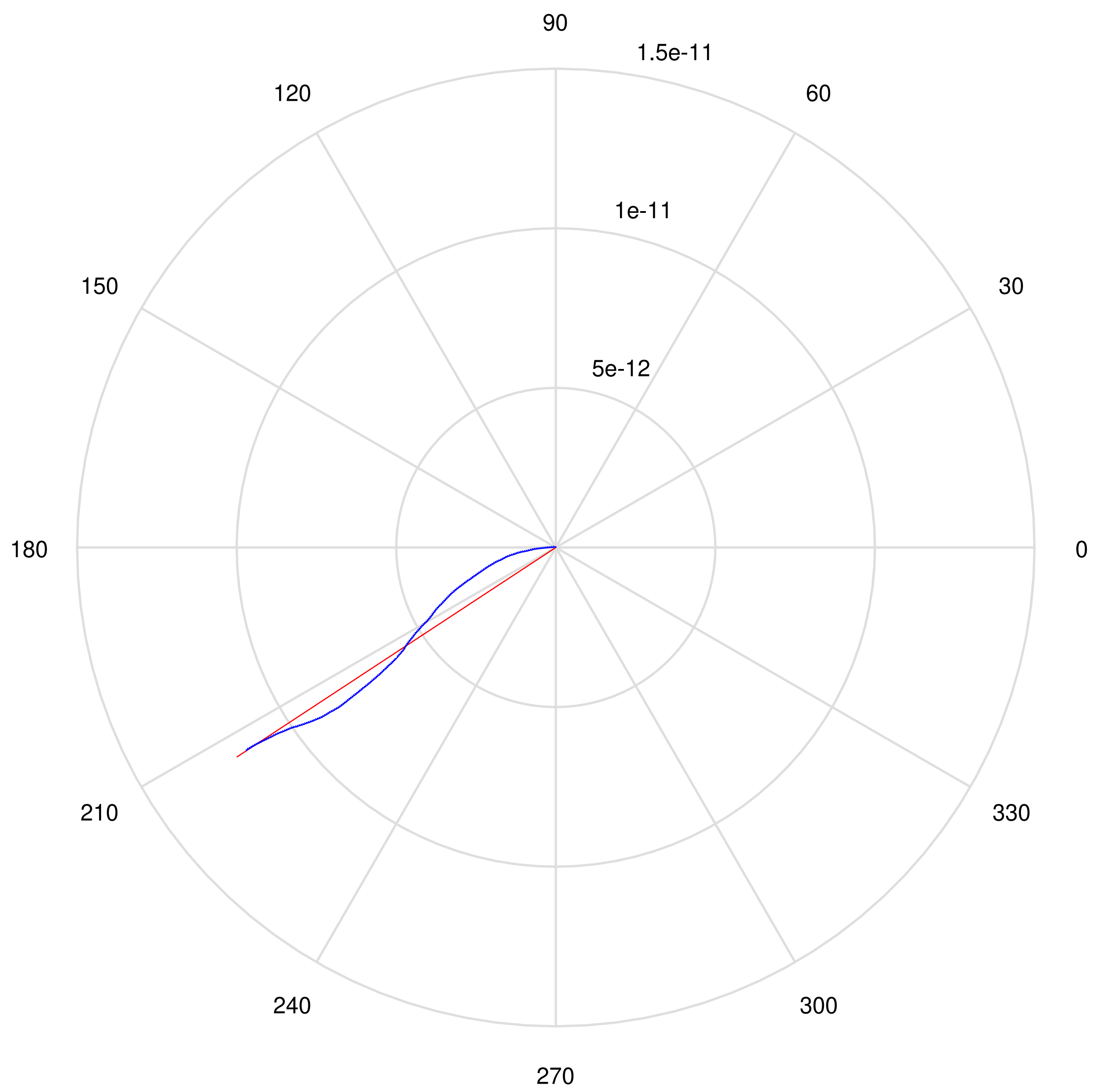


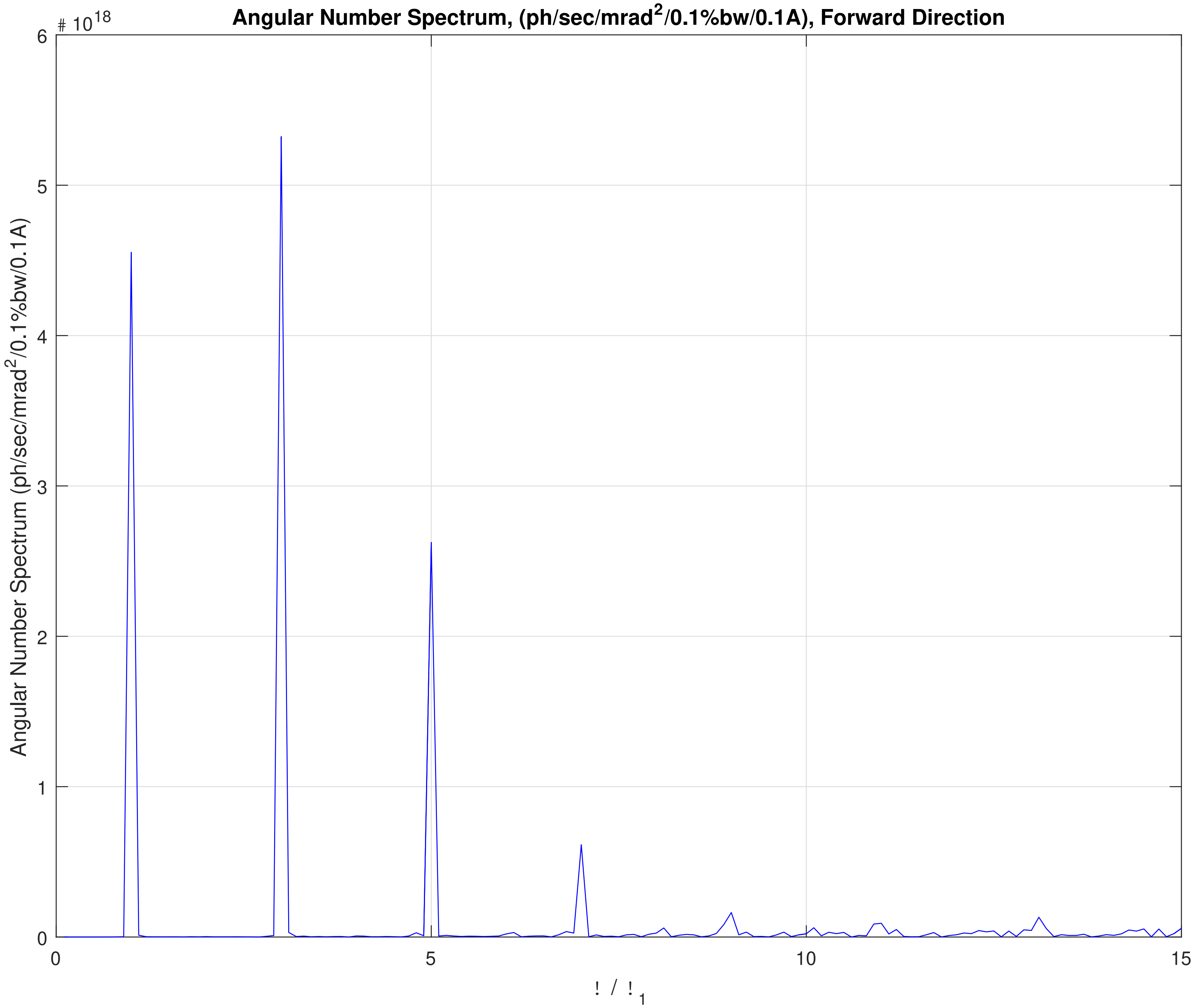
Phase Integral And Effective Length
10-5
PI
Fit
Effective Length = 3.092600 m
Phase Integral (T2m3)
Z (m)

Re and Im Parts Of Ex(!), Forward Direction, ! = !$_1$

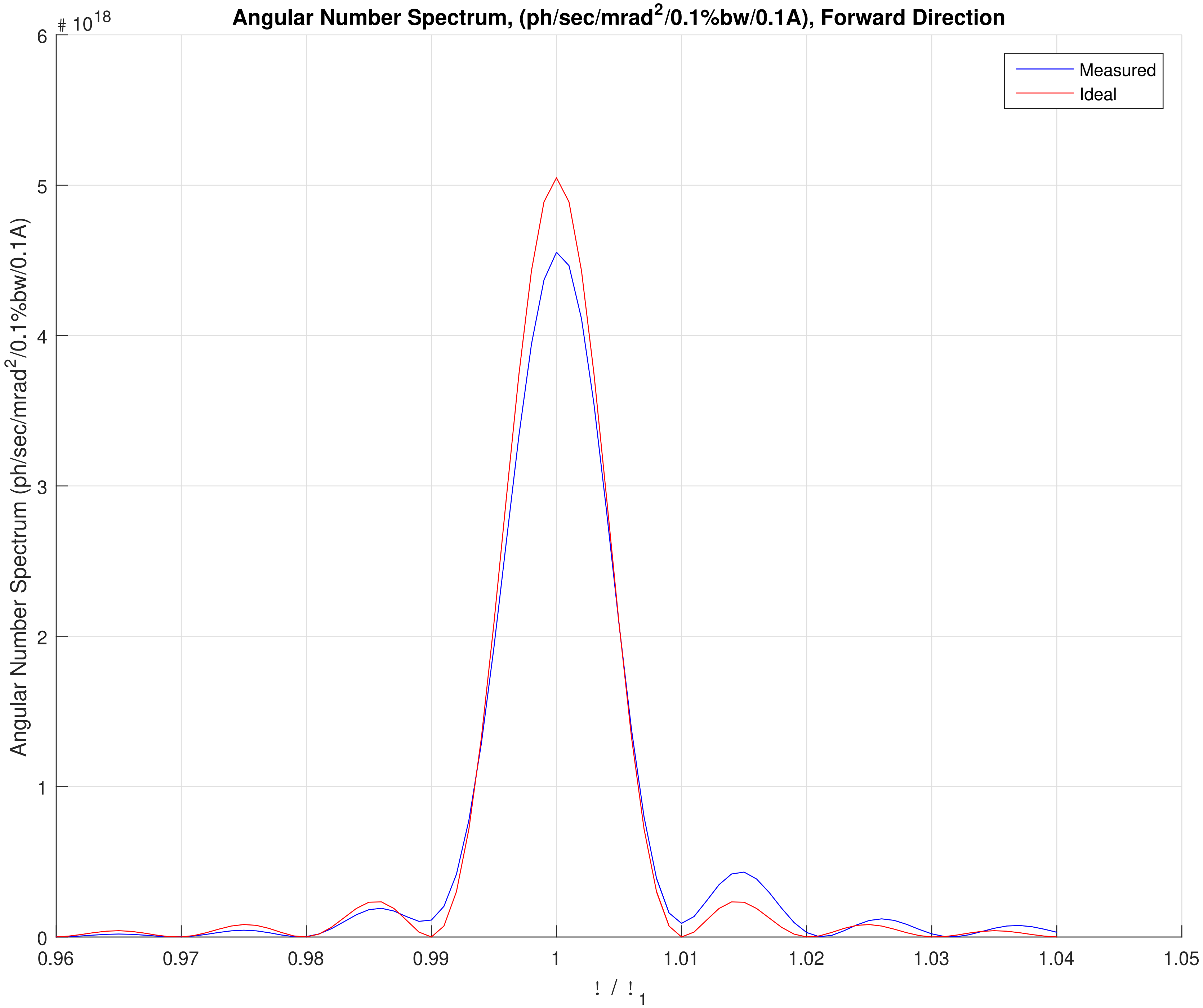


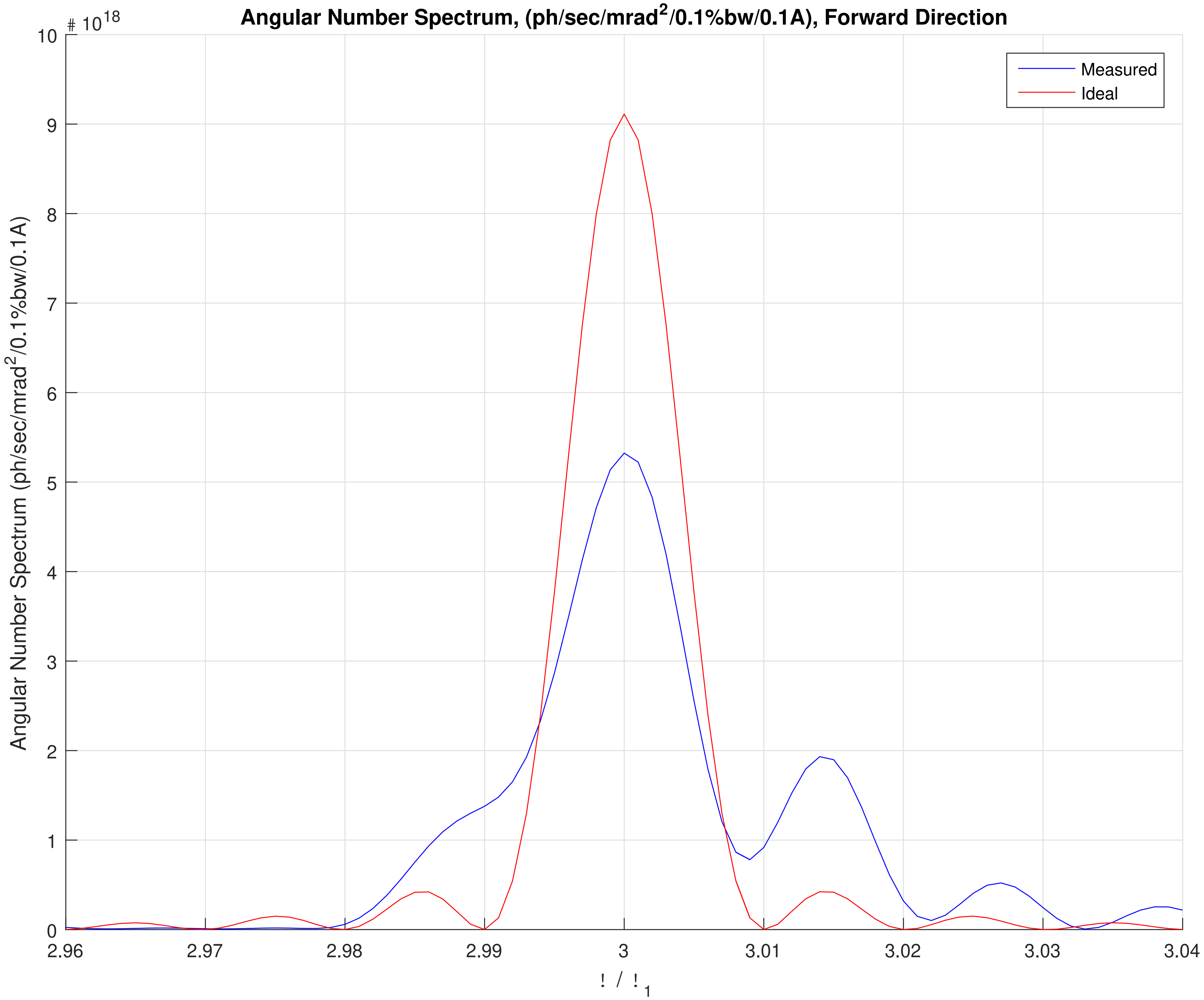
Re and Im Parts Of Ey(!), Forward Direction, ! = ! $_1$



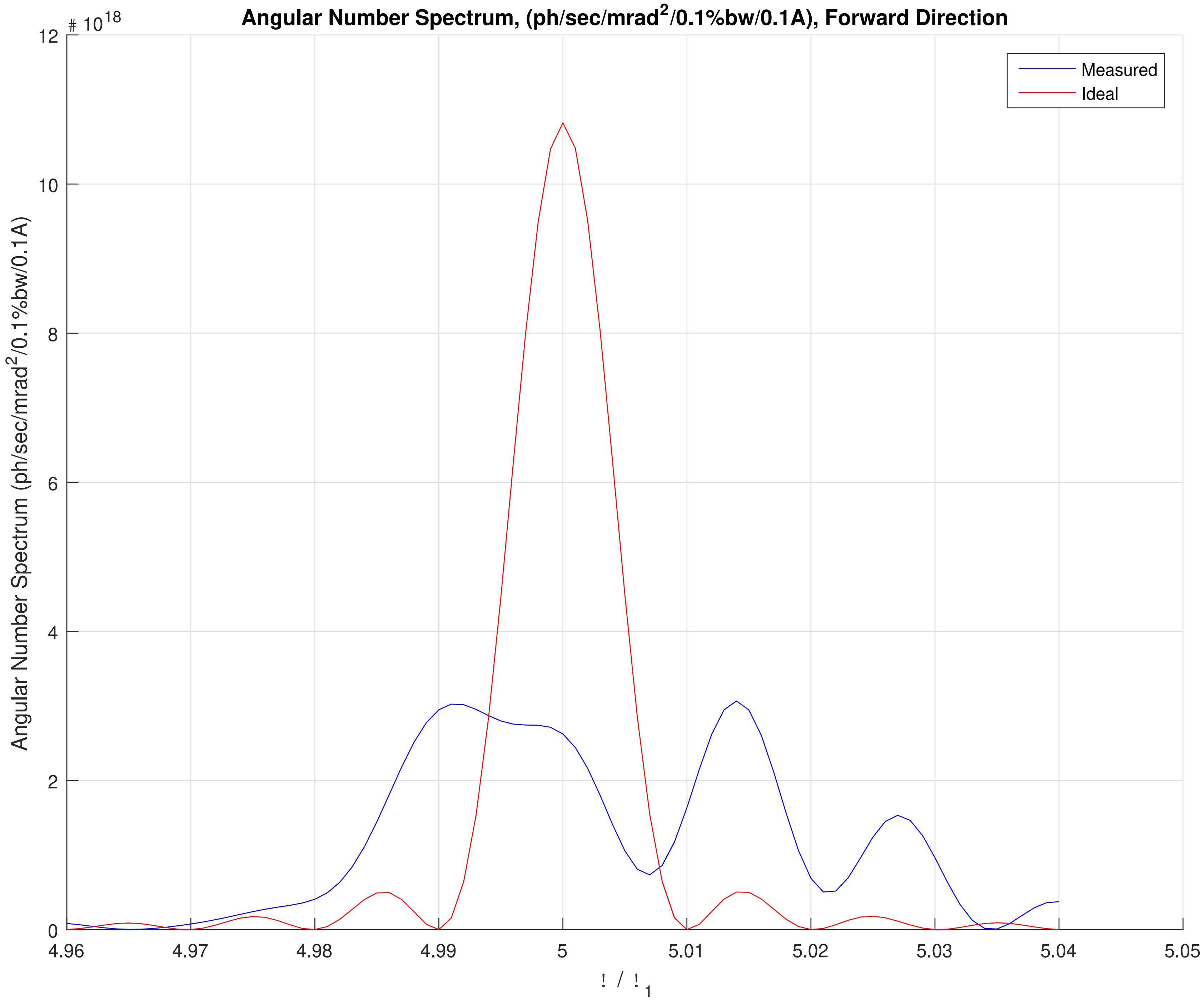


Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
10^18
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
0
1
2
3
4
5
6
0
5
10
15
! / !1


Angular Number Spectrum, (ph/sec/mrad^2/0.1%bw/0.1A), Forward Direction
10^{18}
Angular Number Spectrum (ph/sec/mrad^2/0.1%bw/0.1A)
Measured
Ideal
! / !$_1$
0
1
2
3
4
5
6
0.96
0.97
0.98
0.99
1
1.01
1.02
1.03
1.04
1.05



Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
10^18
10
9
8
7
6
5
4
3
2
1
0
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
Measured
Ideal
2.96
2.97
2.98
2.99
3
3.01
3.02
3.03
3.04
! / ! 1



Angular Number Spectrum, (ph/sec/mrad2/0.1%bw/0.1A), Forward Direction
10^18
12
10
8
6
4
2
0
Angular Number Spectrum (ph/sec/mrad2/0.1%bw/0.1A)
Measured
Ideal
4.96
4.97
4.98
4.99
5
5.01
5.02
5.03
5.04
5.05
! / ! 1