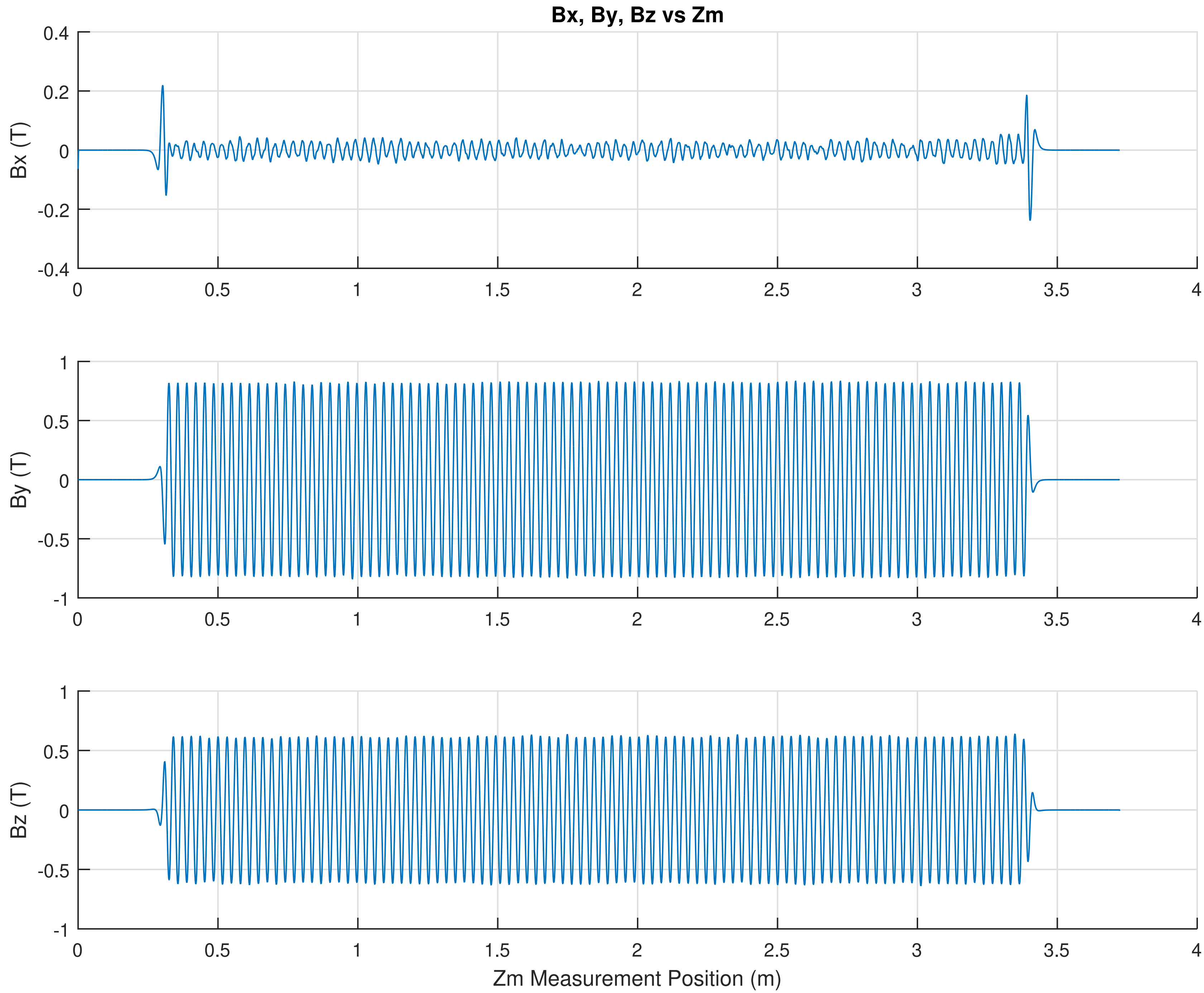
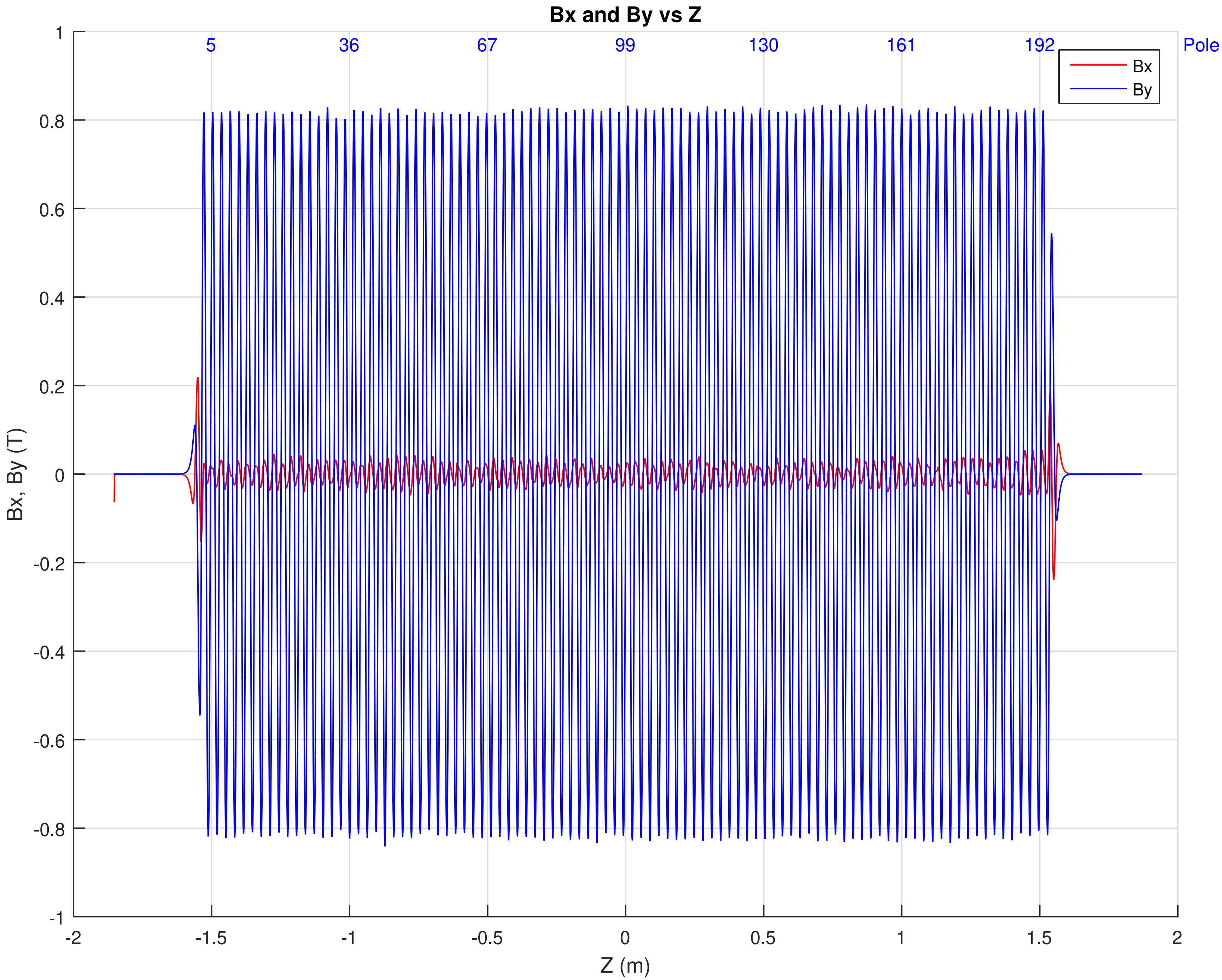
SLAC Magnetic Measurements

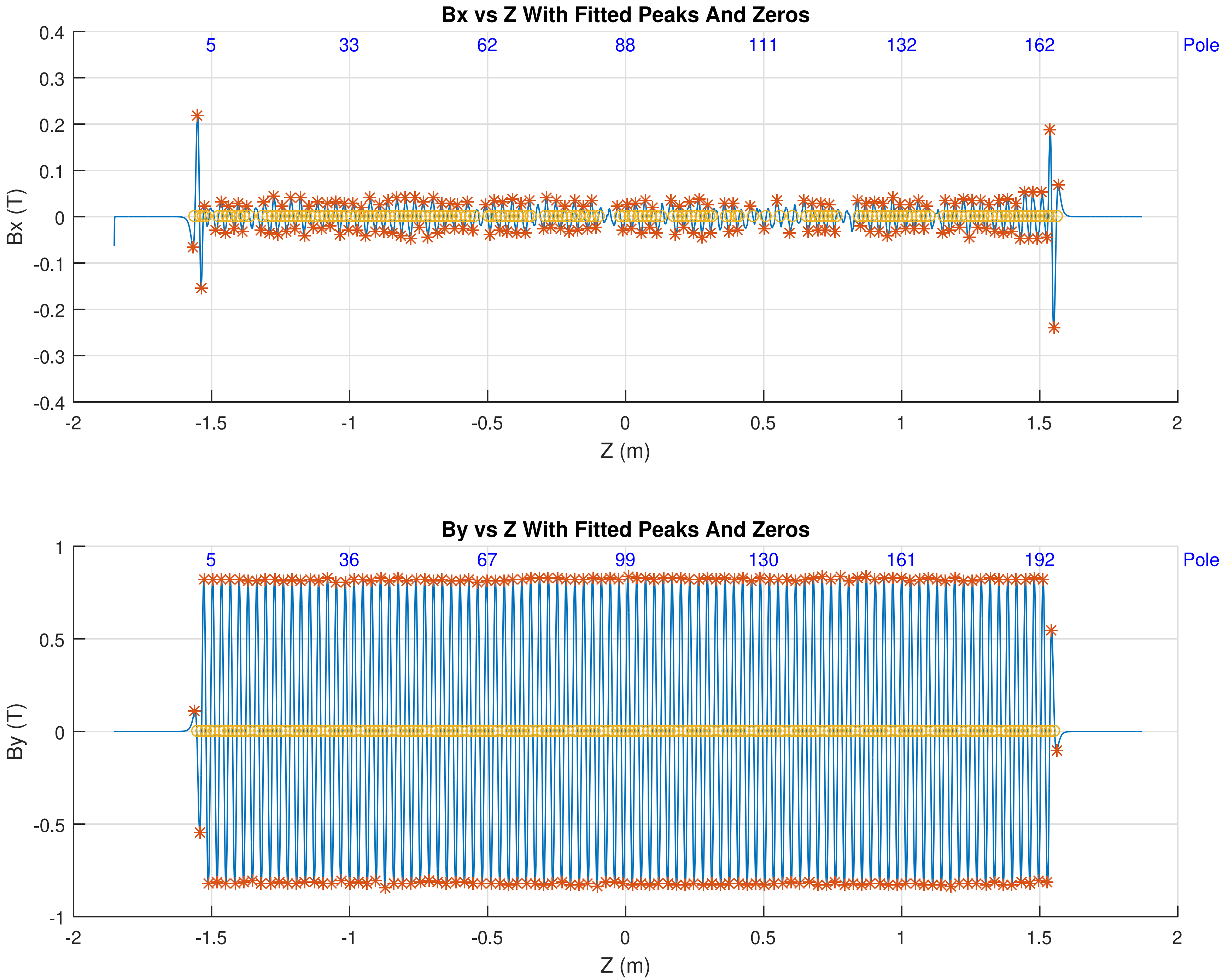
EPU Analysis

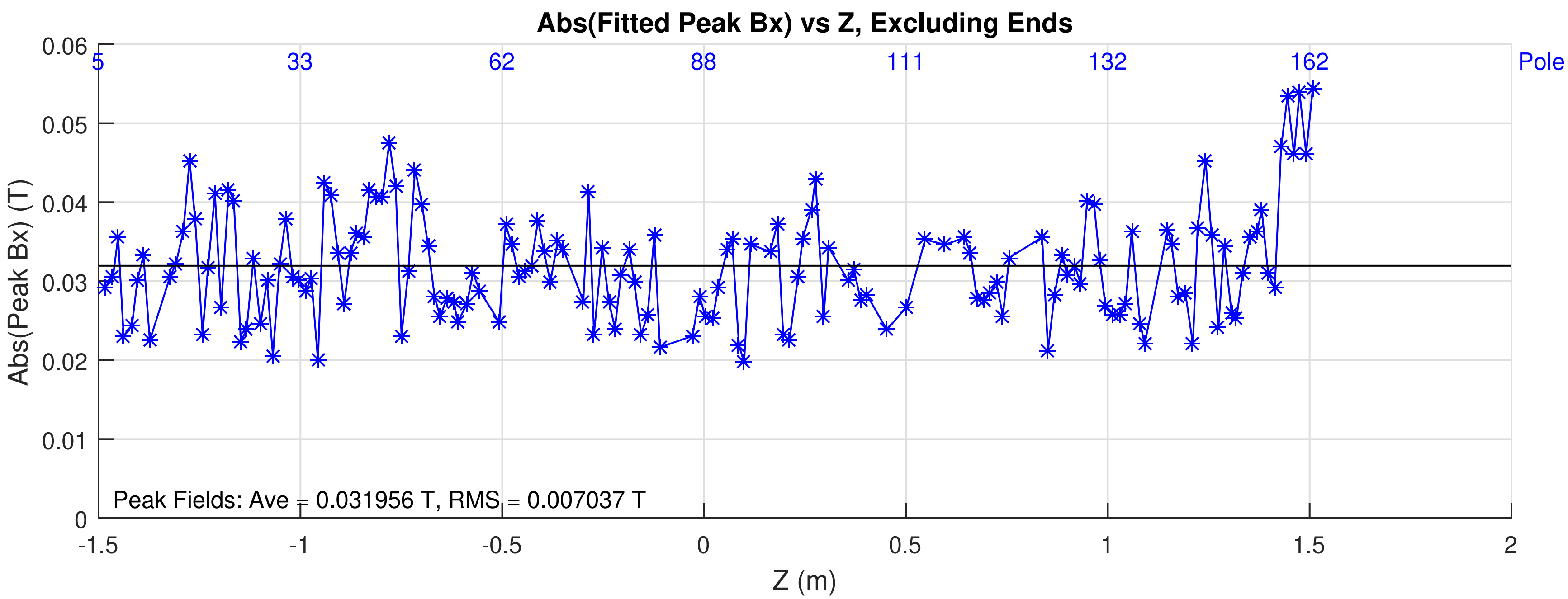
Parameters:
INPUT-FILE-DIR =C:\MagData\LCLS\Undulator\Delta\DATASET0001\Assembled Measurements\Run 148\LPVMF\KR1000\
INPUT-FILE-NAME =hall2-anal-meas-field.dat
INPUT-FILE-TYPE =ZBXYZH
CORR-REQUIRED =0
GAMMA =26627.1
NOM-LAMBDA-U =0
NOM-K-VALUE =0
NOM-LAMBDA-R =0
NUM-POLES =200
NUM-END-POLES =4
CELL-LENGTH =3.126

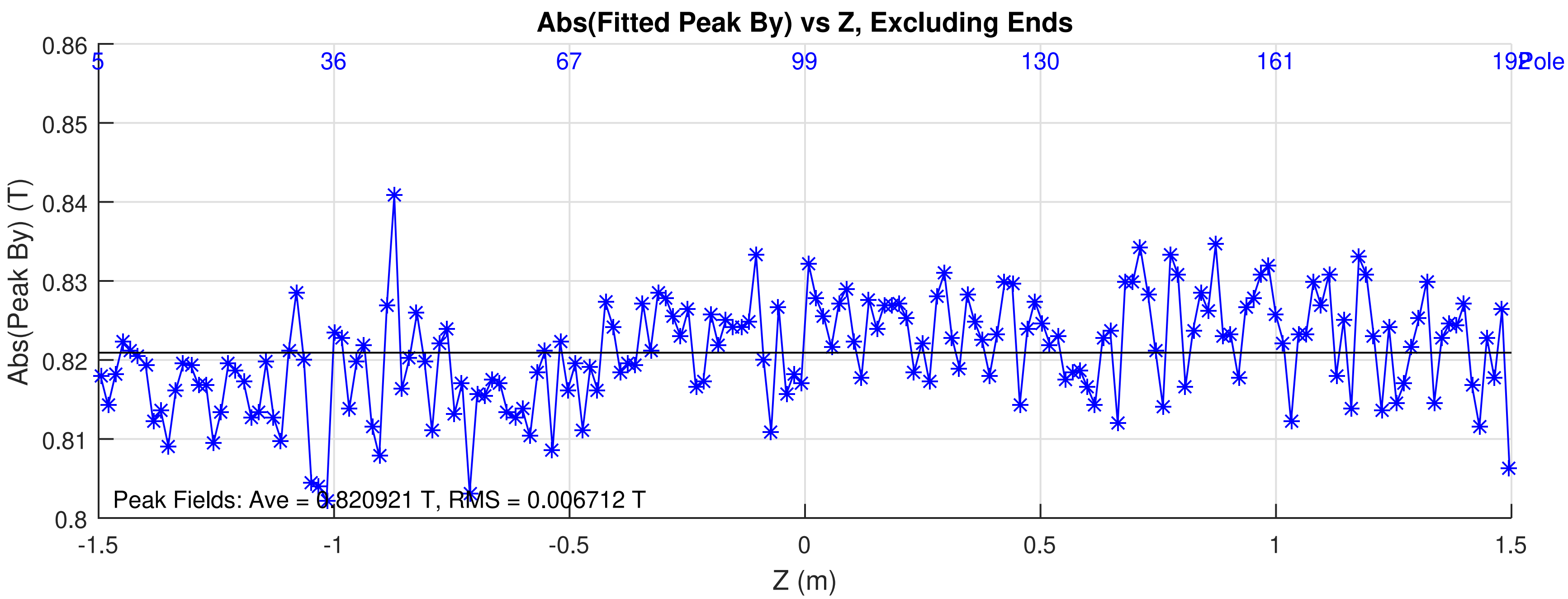


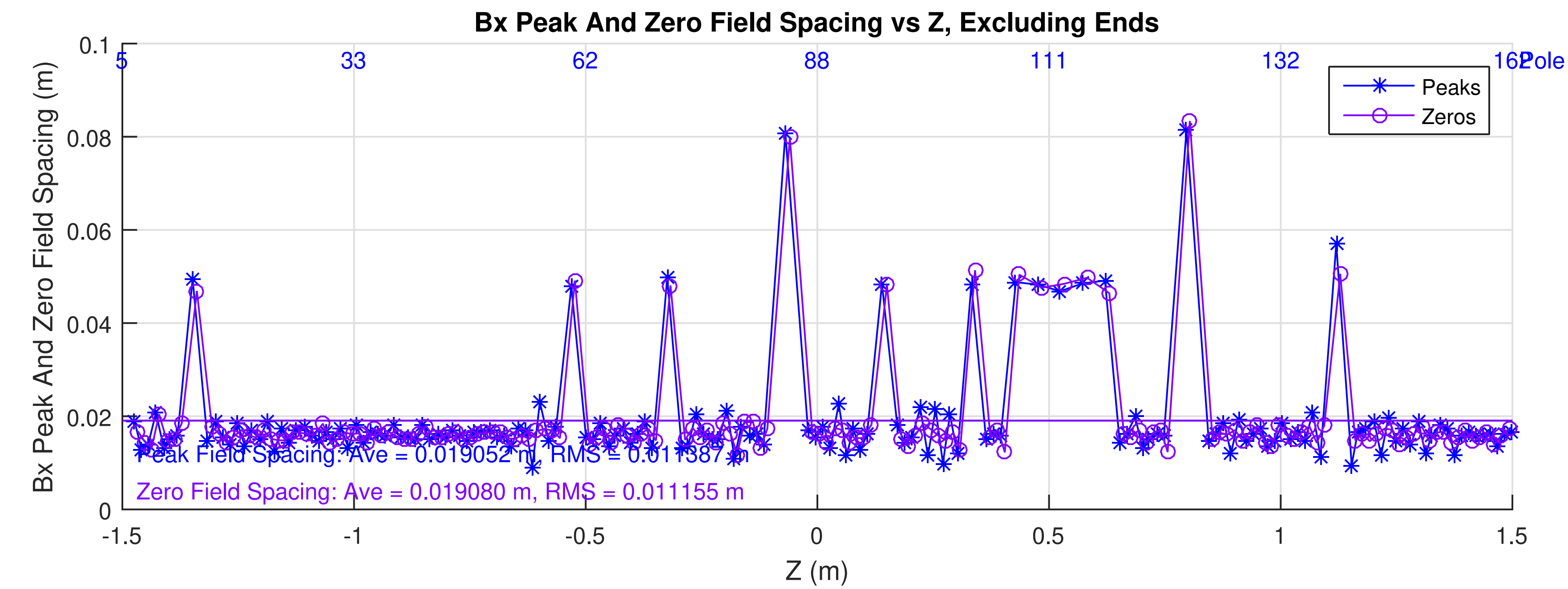
Bx, By, Bz vs Zm
Bx (T)
0.4
0.2
0
-0.2
-0.4
By (T)
1
0.5
0
-0.5
-1
Bz (T)
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
3
3.5
4
Zm Measurement Position (m)


Bx and By vs Z
5
36
67
99
130
161
192
Pole
Bx
By
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
Bx, By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

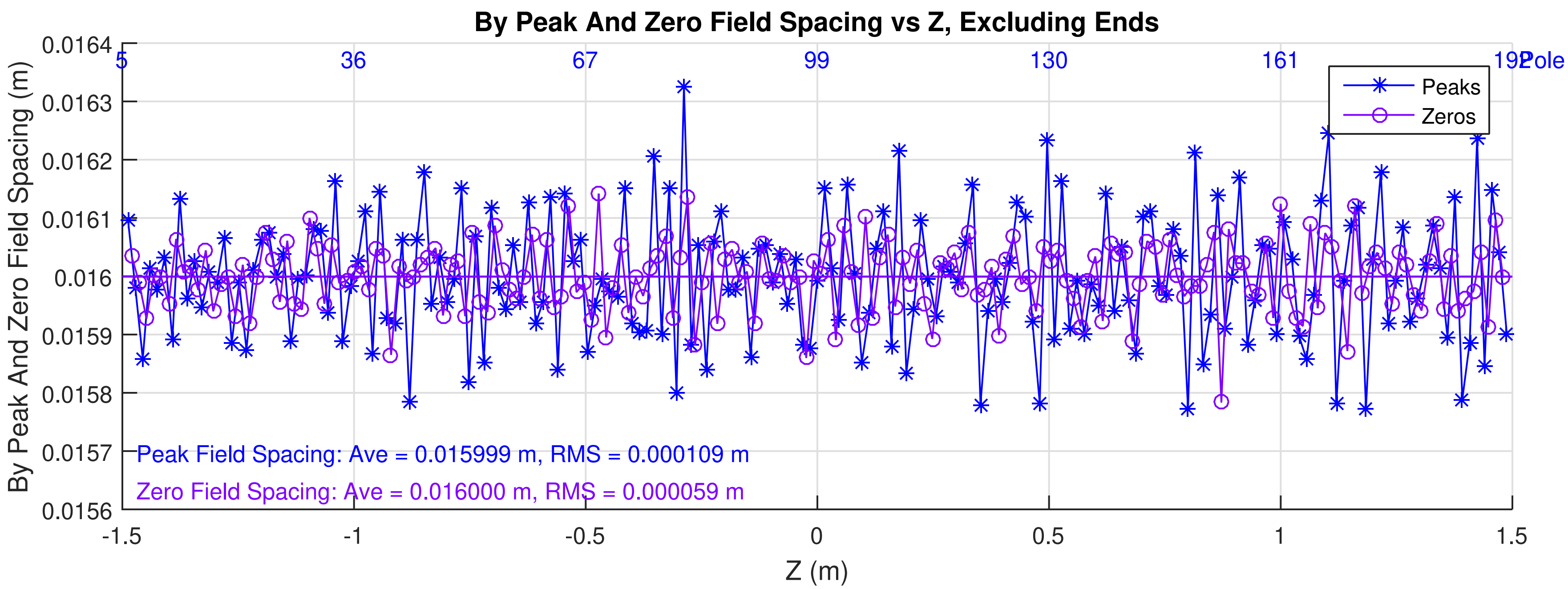

Bx vs Z With Fitted Peaks And Zeros
5
33
62
88
111
132
162
Pole
Bx (T)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)
By vs Z With Fitted Peaks And Zeros
5
36
67
99
130
161
192
Pole
By (T)
1
0.5
0
-0.5
-1
Z (m)


Abs(Fitted Peak Bx) vs Z, Excluding Ends
Abs(Peak Bx) (T)
Z (m)
Pole
5
33
62
88
111
132
162
Peak Fields: Ave = 0.031956 T, RMS = 0.007037 T

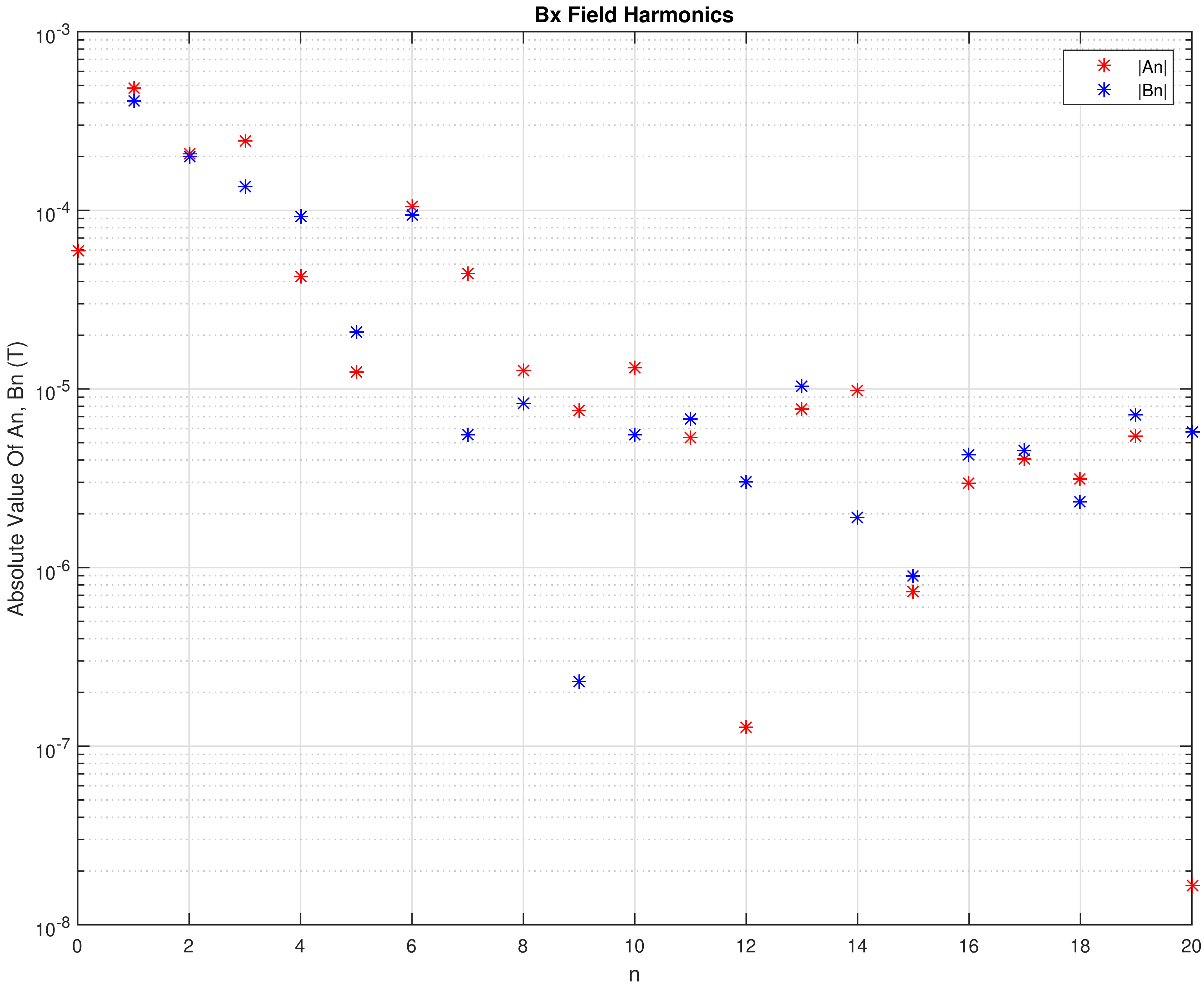

Abs(Fitted Peak By) vs Z, Excluding Ends
Abs(Peak By) (T)
Z (m)
Pole
5
36
67
99
130
161
192
Peak Fields: Ave = 0.820921 T, RMS = 0.006712 T

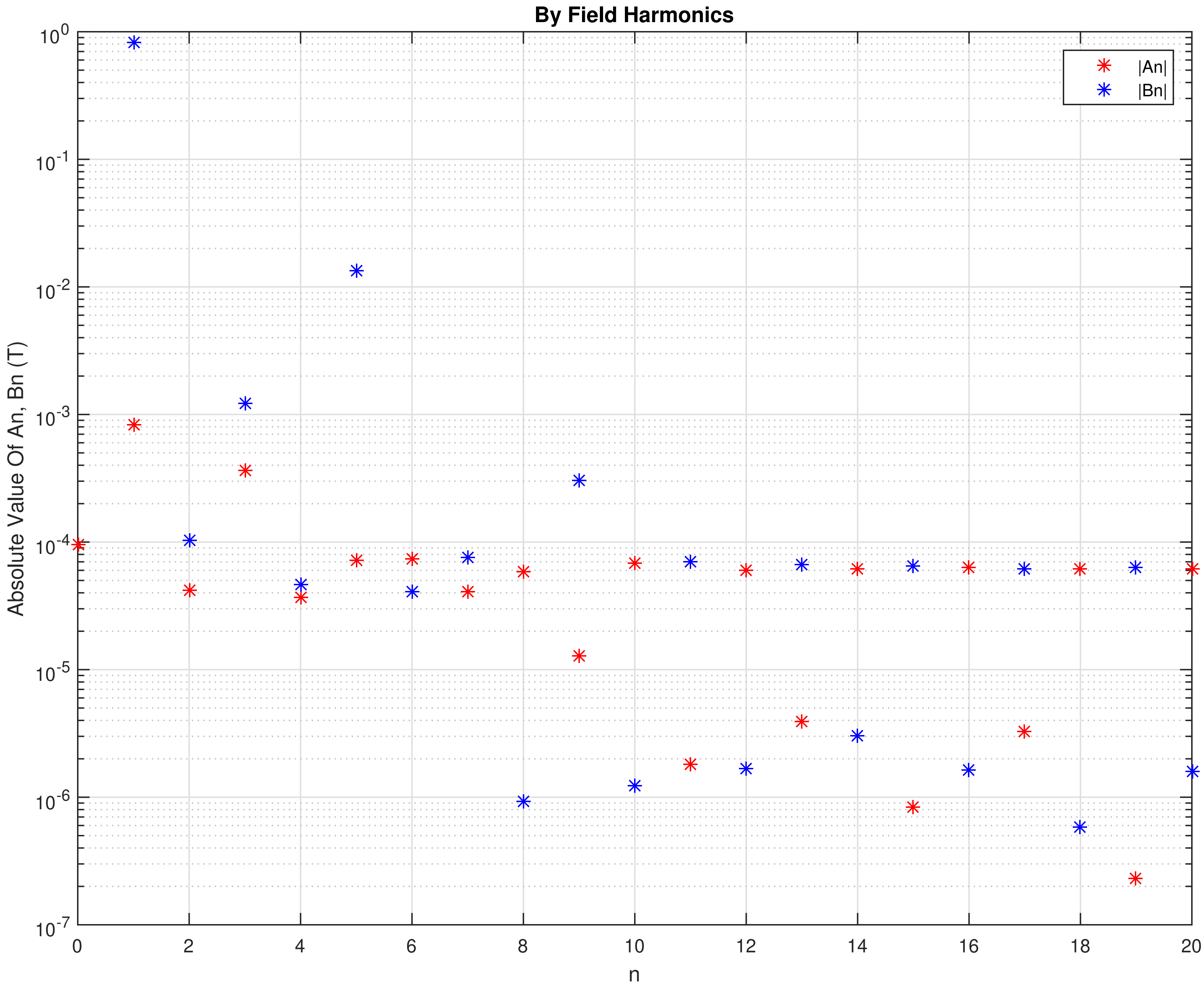


Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Pole
5
33
62
88
111
132
162
Peaks
Zeros
Peak Field Spacing: Ave = 0.019052 m, RMS = 0.011387 m
Zero Field Spacing: Ave = 0.019080 m, RMS = 0.011155 m

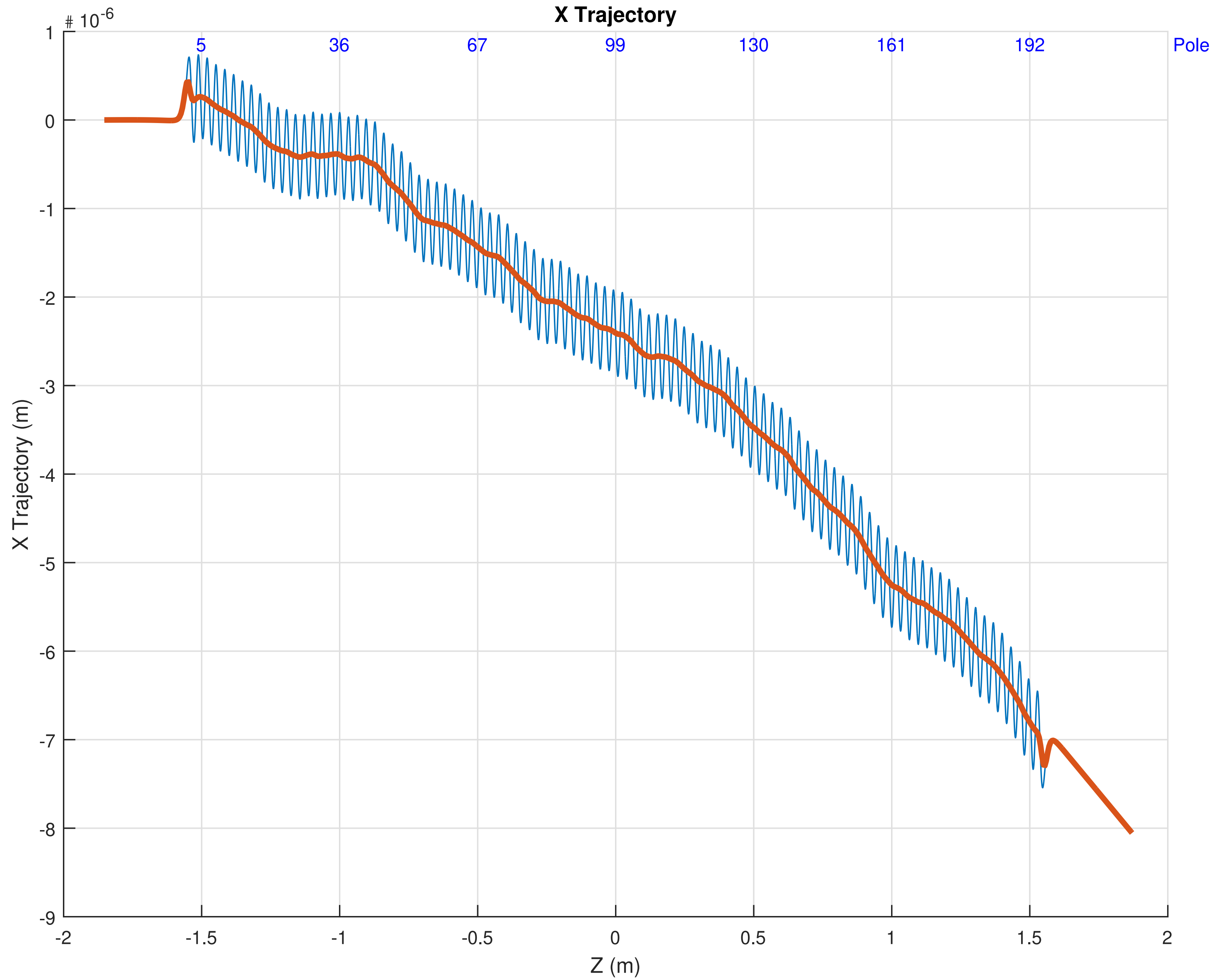


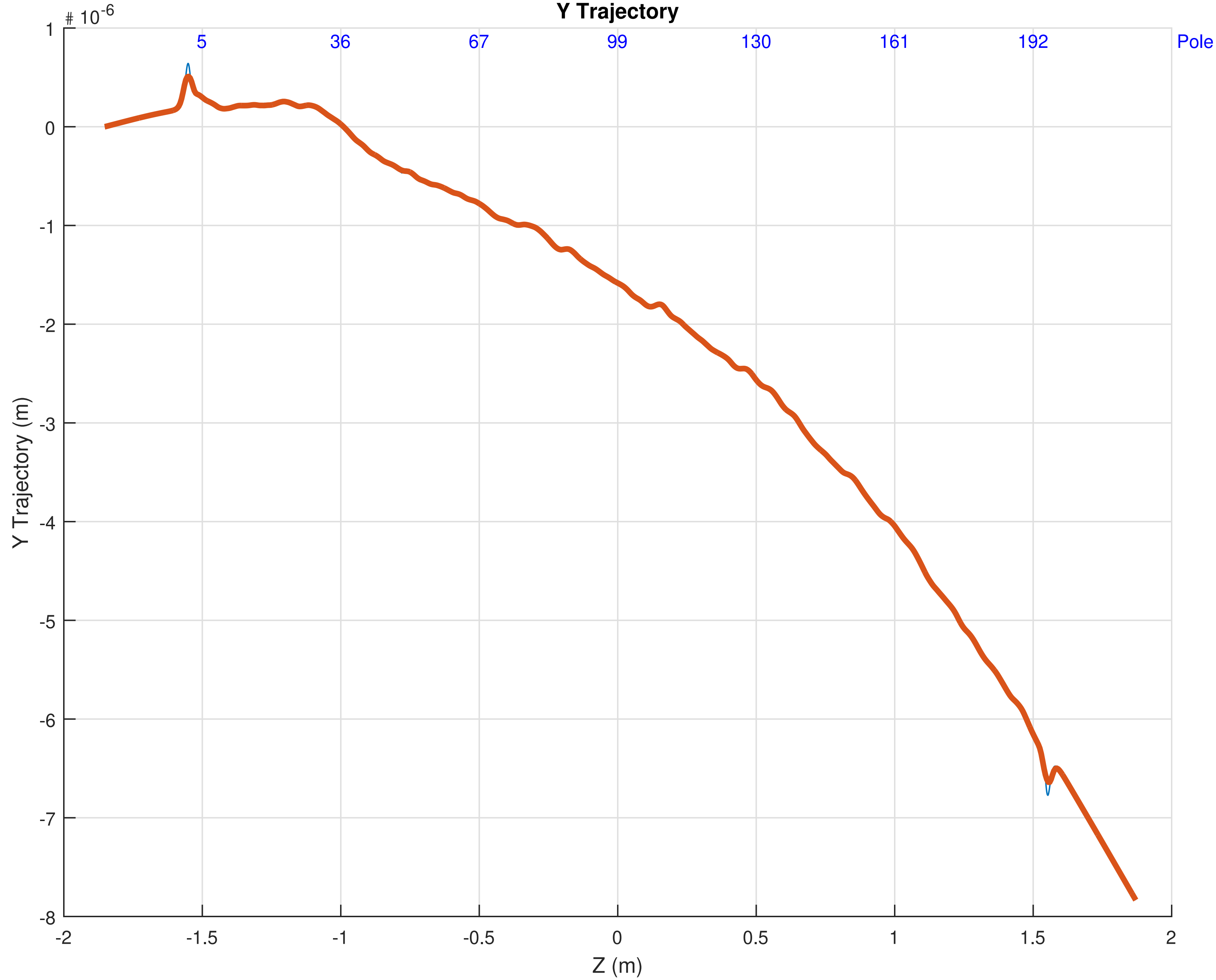
By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
Pole
5
36
67
99
130
161
192
Peaks
Zeros
Peak Field Spacing: Ave = 0.015999 m, RMS = 0.000109 m
Zero Field Spacing: Ave = 0.016000 m, RMS = 0.000059 m

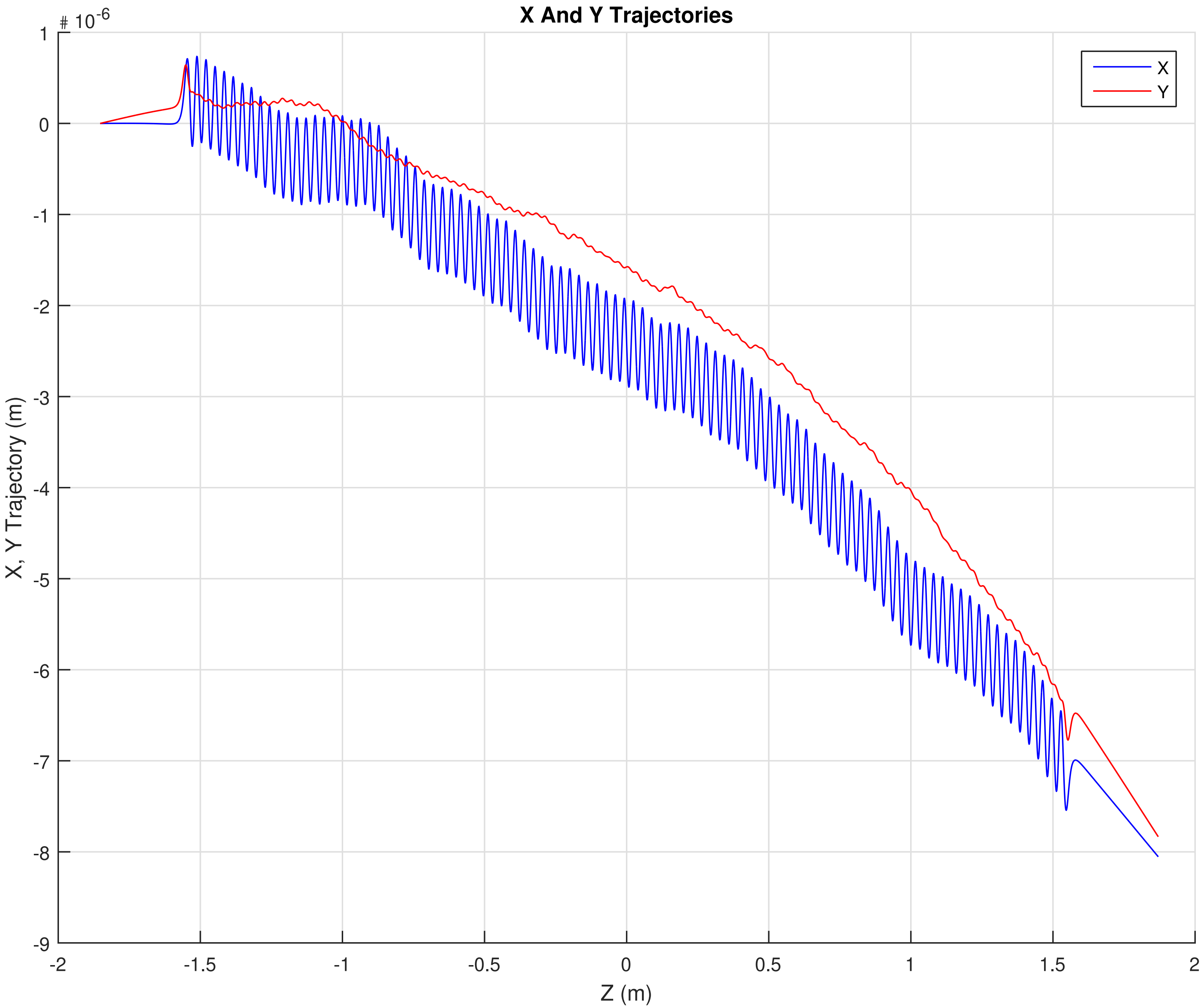

Bx Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
0
2
4
6
8
10
12
14
16
18
20

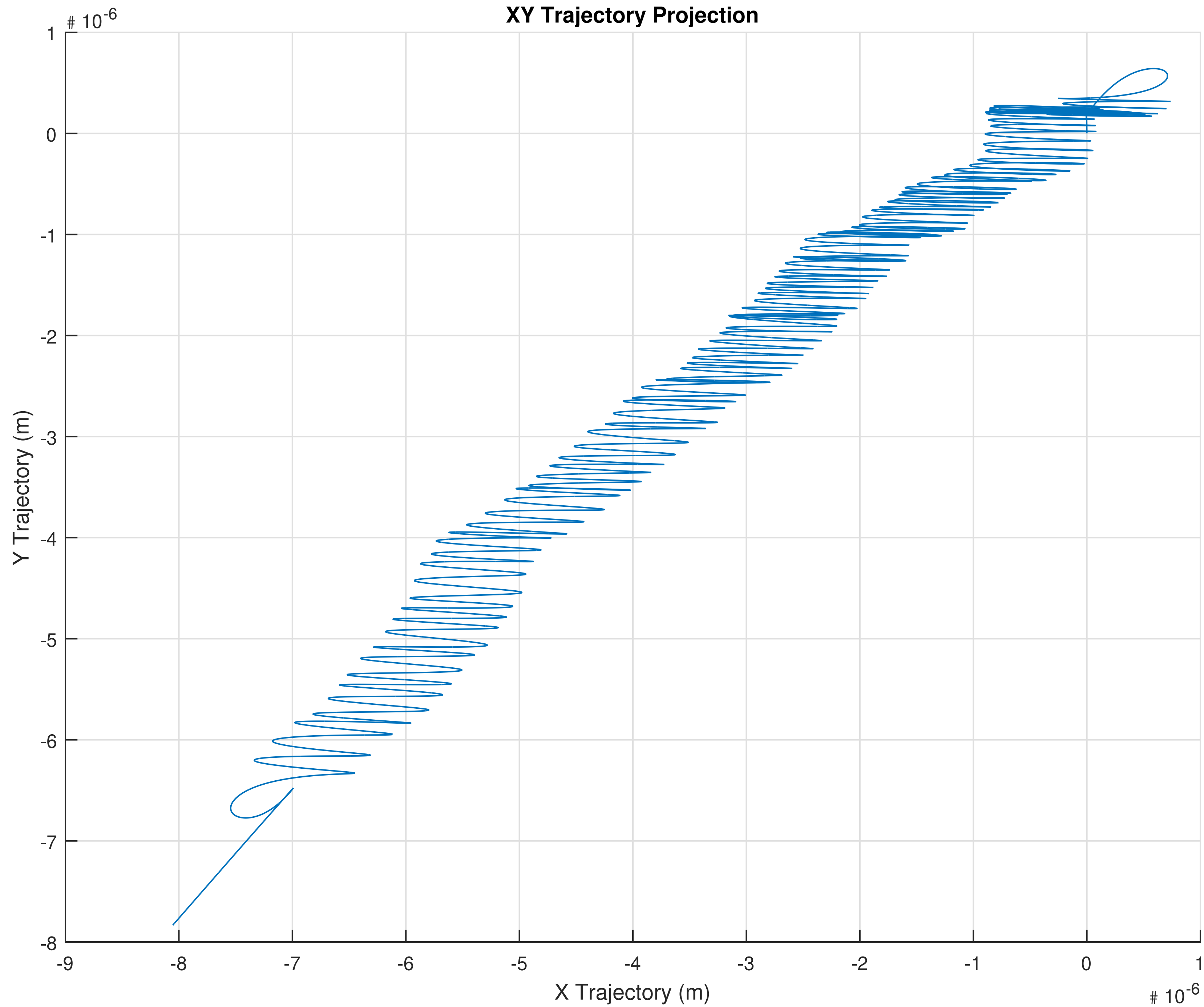


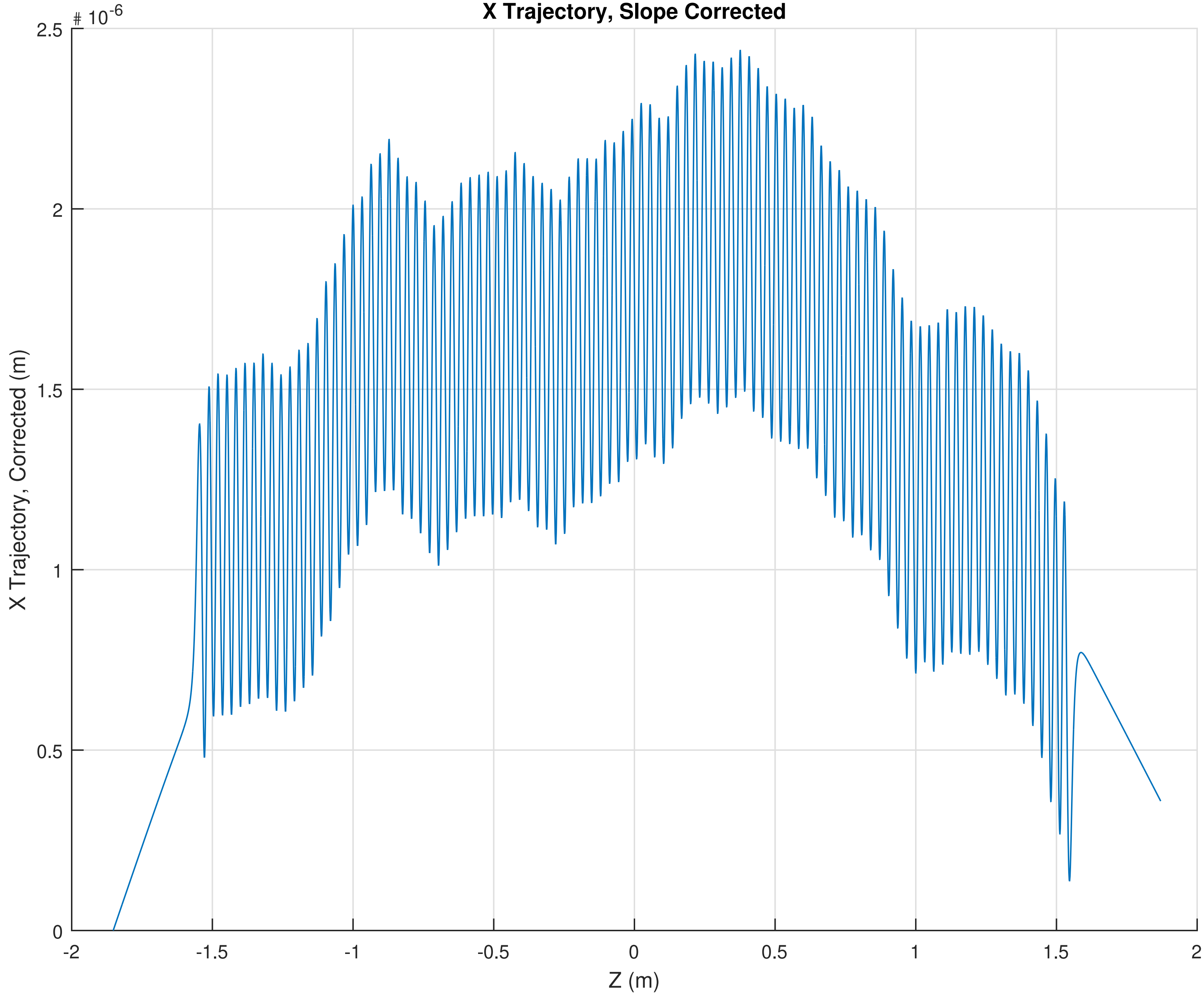
By Field Harmonics
|An|
|Bn|
Absolute Value Of An, Bn (T)
n
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
0
2
4
6
8
10
12
14
16
18
20

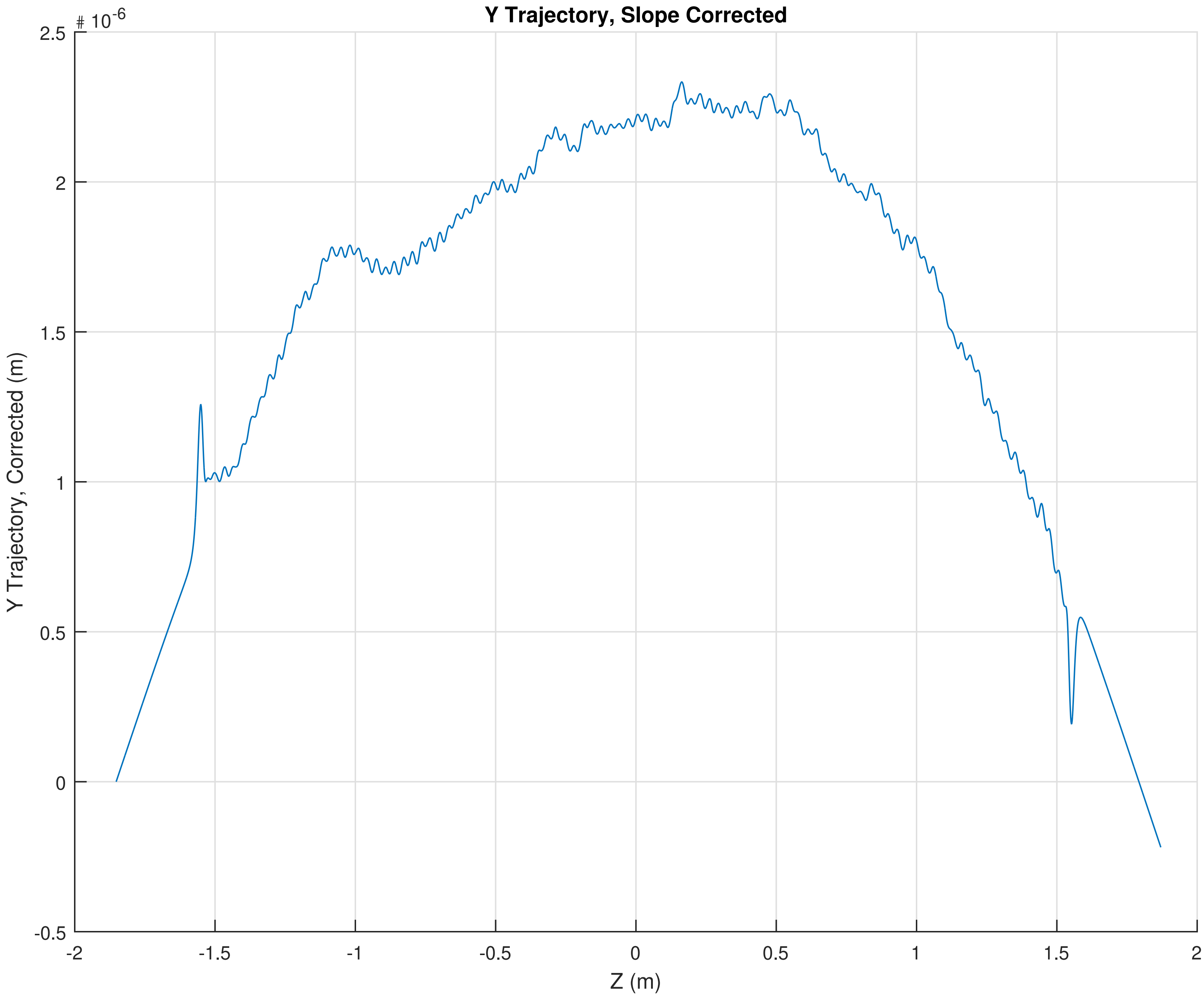

X Trajectory
10^-6
5
36
67
99
130
161
192
Pole
X Trajectory (m)
Z (m)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2


Y Trajectory
10^-6
1
0
-1
-2
-3
-4
-5
-6
-7
-8
5
36
67
99
130
161
192
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)
Y Trajectory (m)

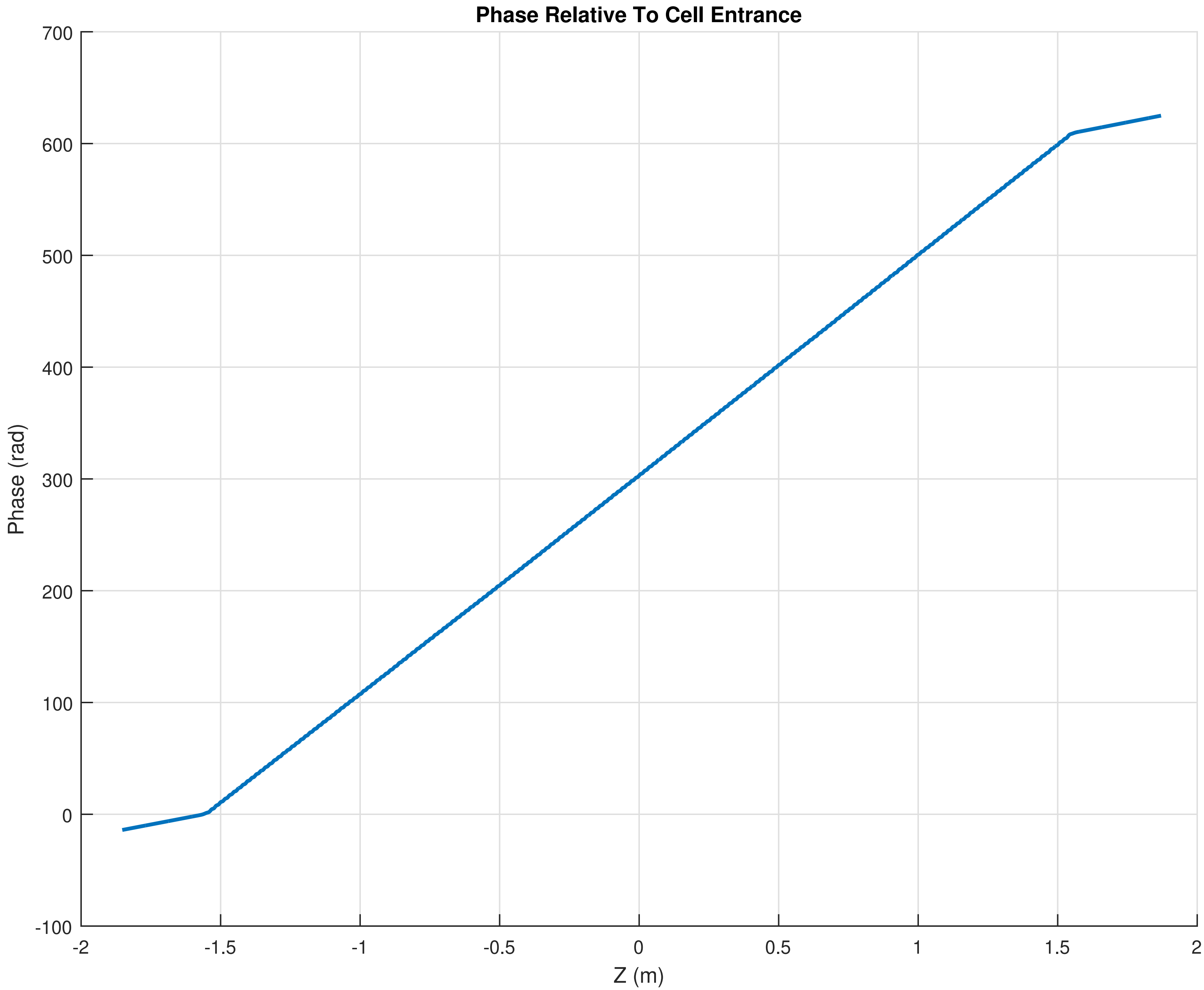

X And Y Trajectories
10^-6
X
Y
X, Y Trajectory (m)
Z (m)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

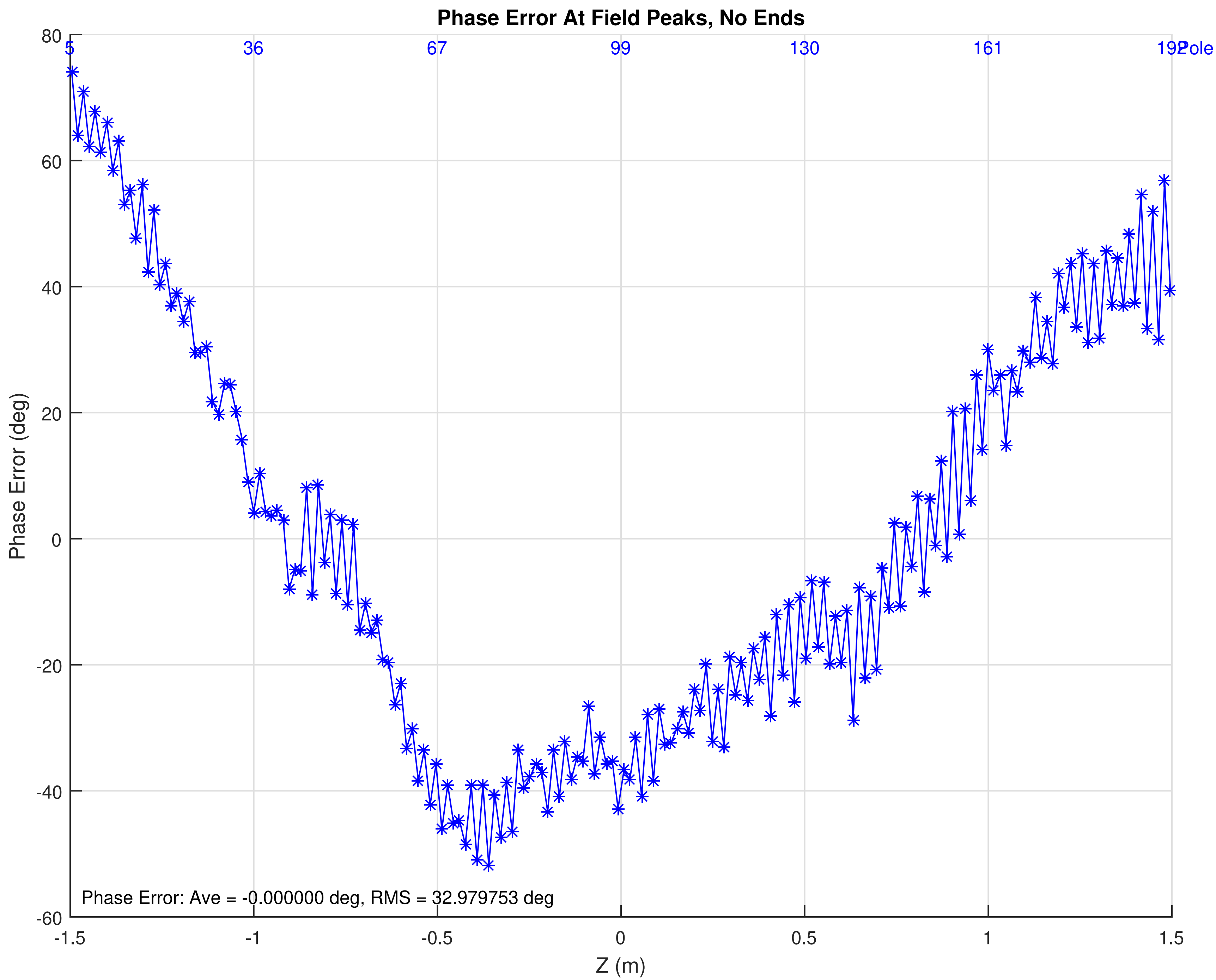

XY Trajectory Projection
10-6
Y Trajectory (m)
X Trajectory (m)
10-6
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
1


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

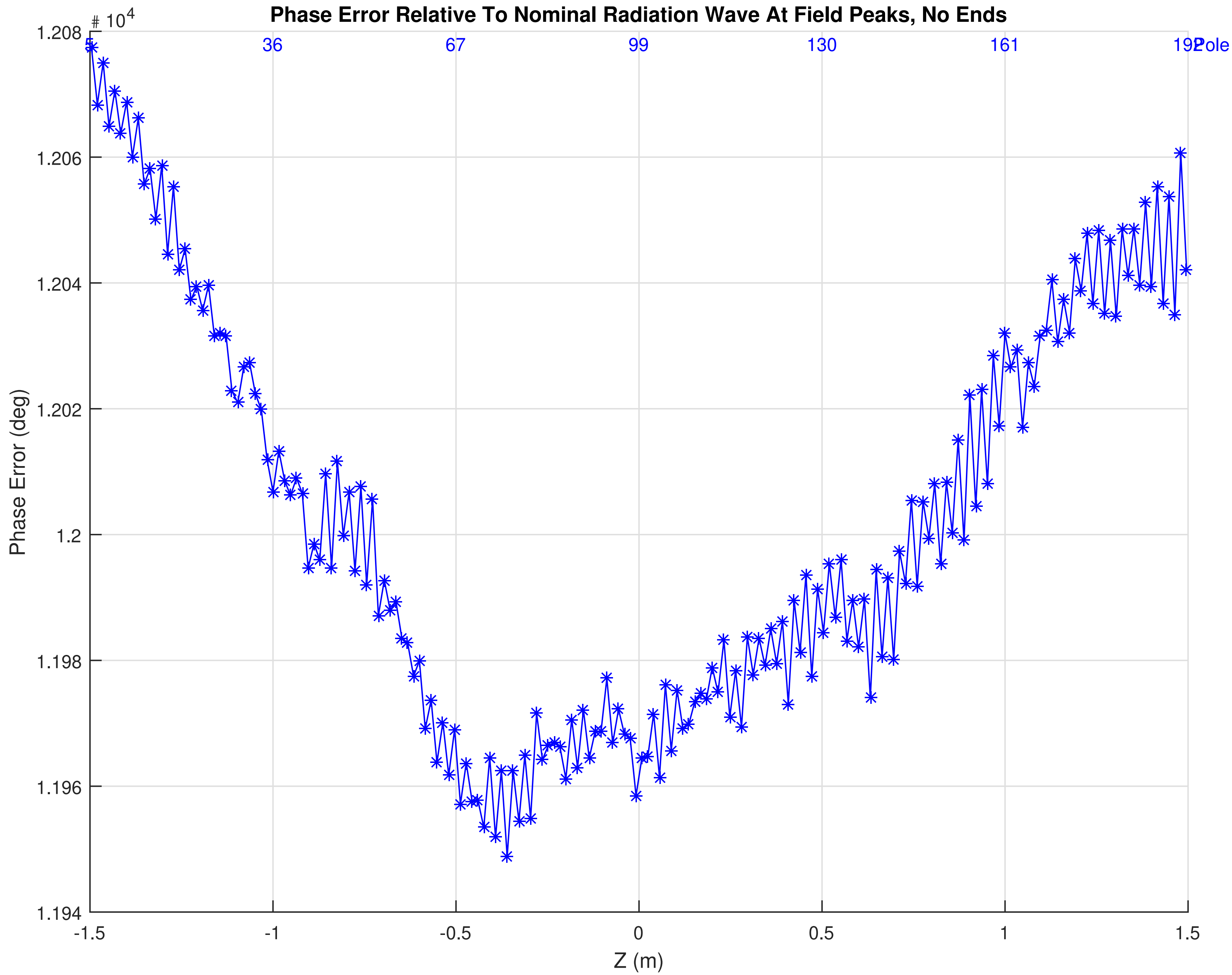


Y Trajectory, Slope Corrected
10-6
2.5
2
1.5
1
0.5
0
-0.5
Y Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)


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



Phase Error At Field Peaks, No Ends
5
36
67
99
130
161
192
Pole
80
60
40
20
0
-20
-40
-60
Phase Error (deg)
Phase Error: Ave = -0.000000 deg, RMS = 32.979753 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
10^4
1.208
1.206
1.204
1.202
1.2
1.198
1.196
1.194
Phase Error (deg)
5
36
67
99
130
161
192
Pole
-1.5
-1
-0.5
0
0.5
1
1.5
Z (m)