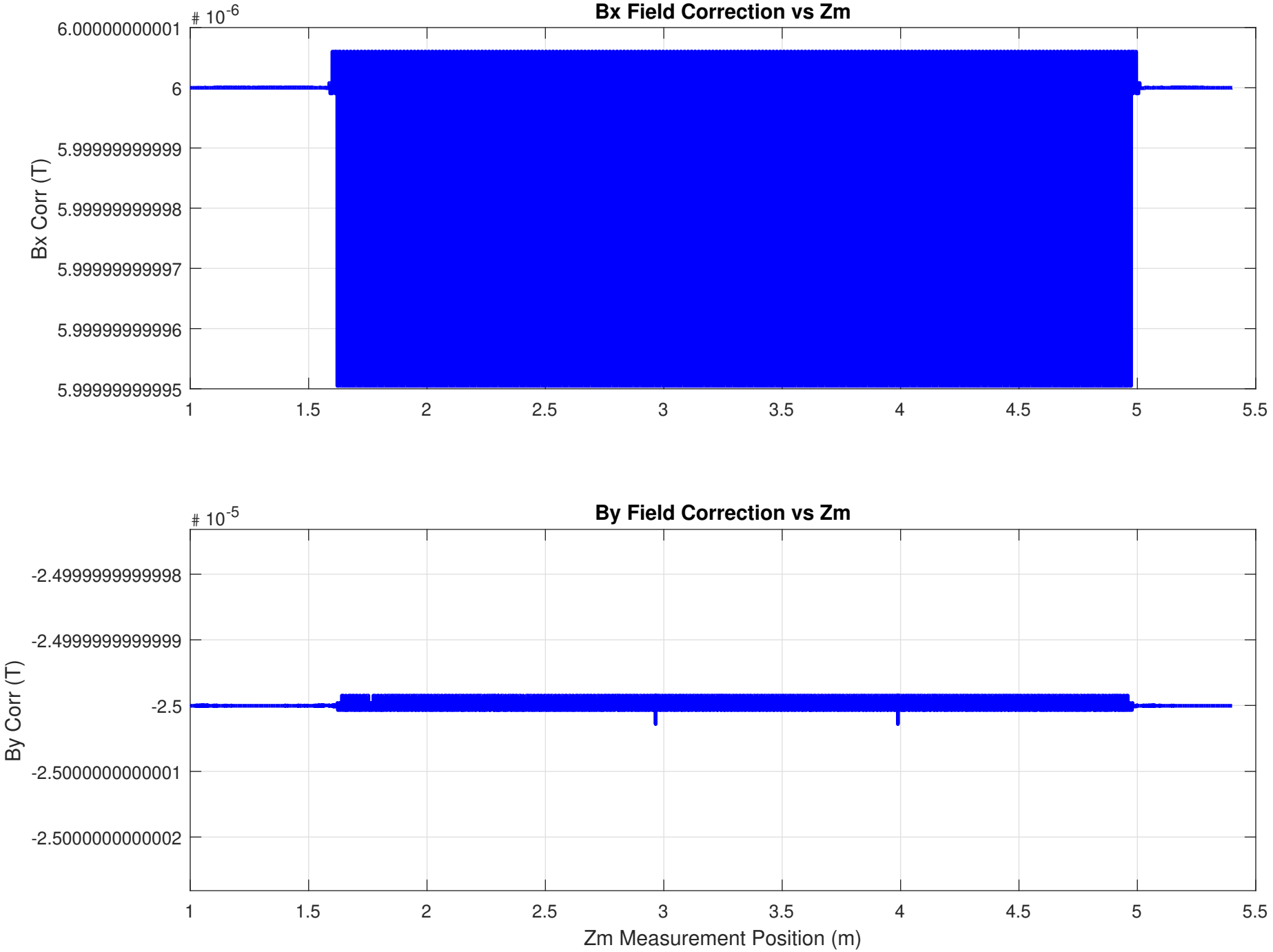
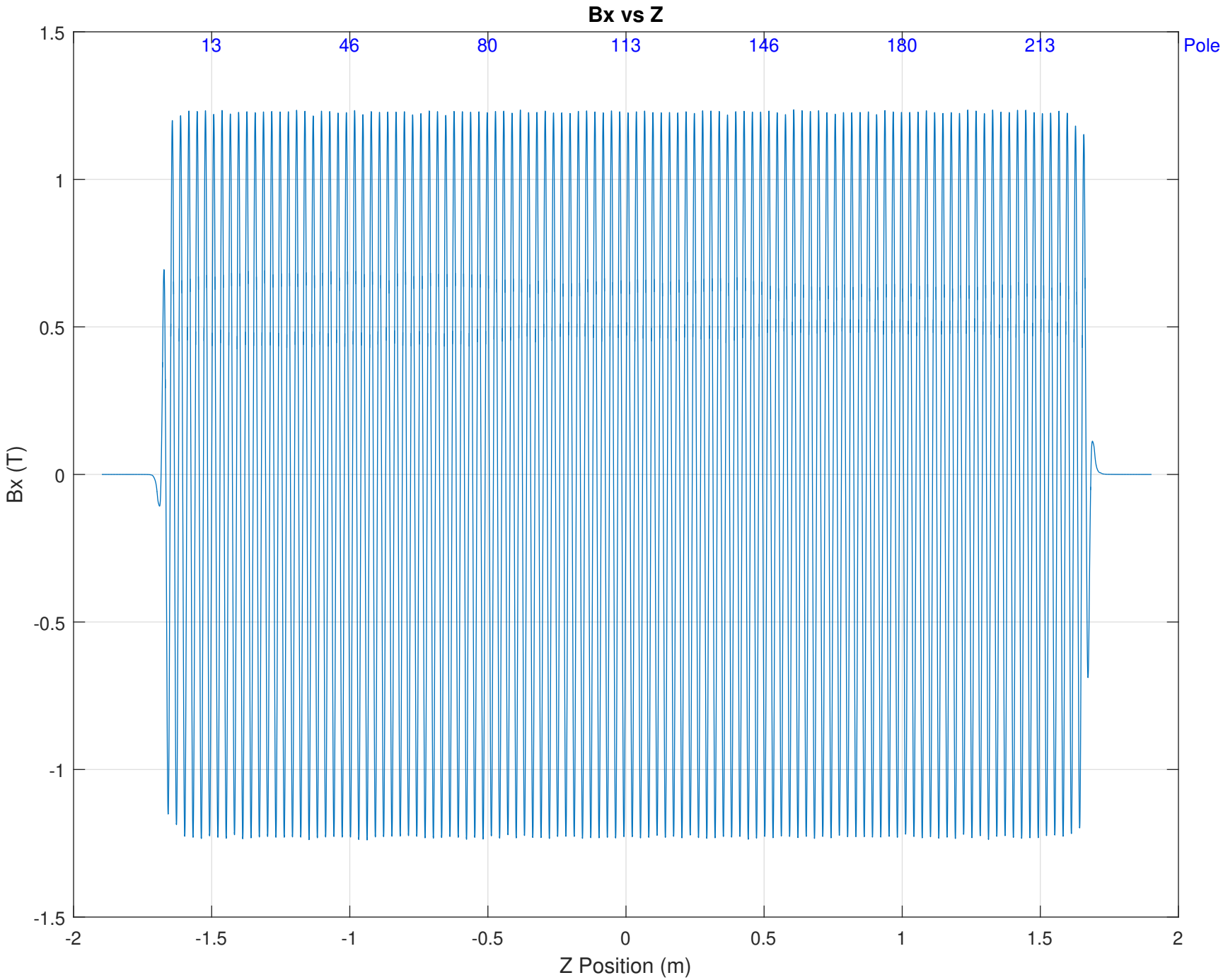
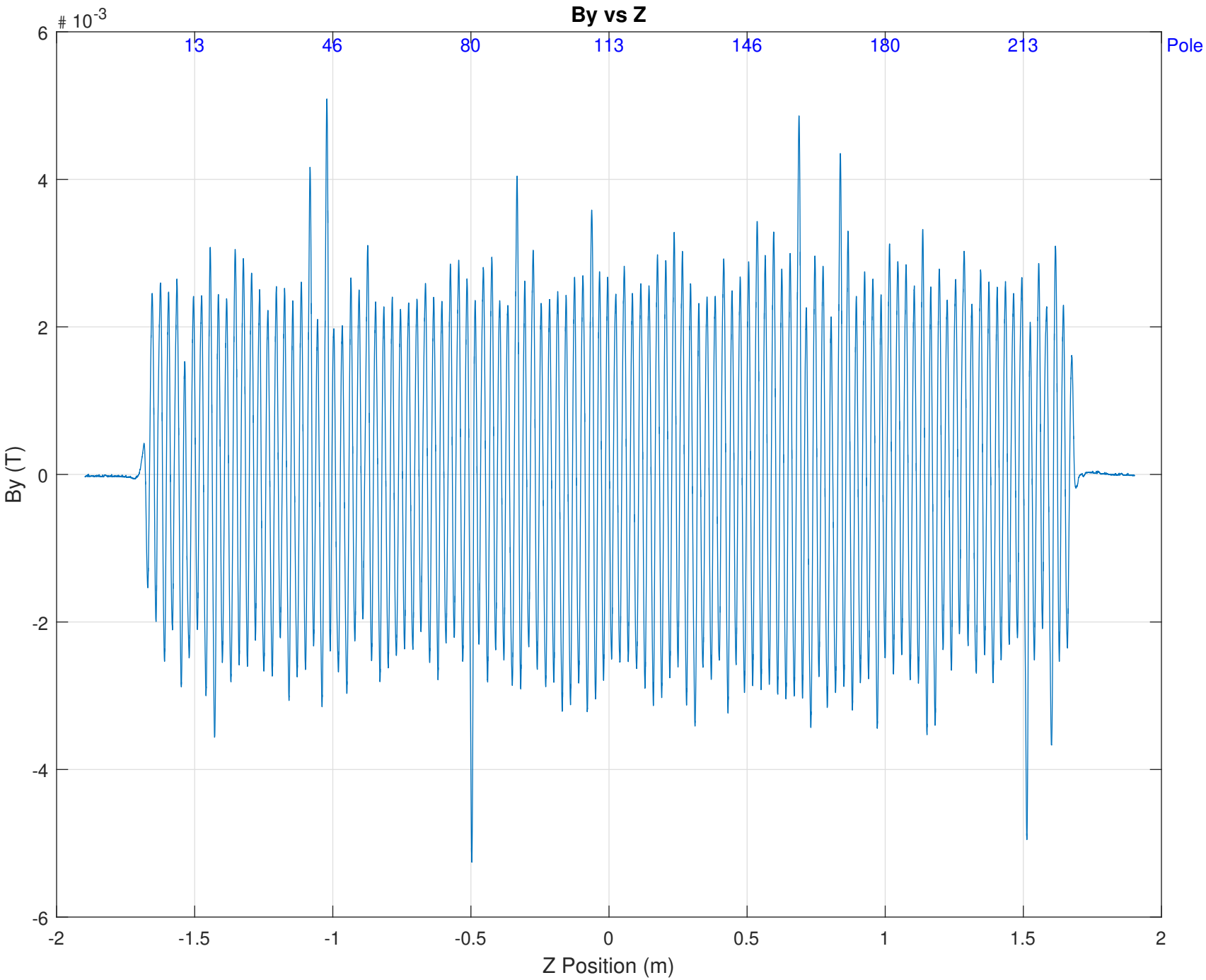
SLAC Magnetic Measurements

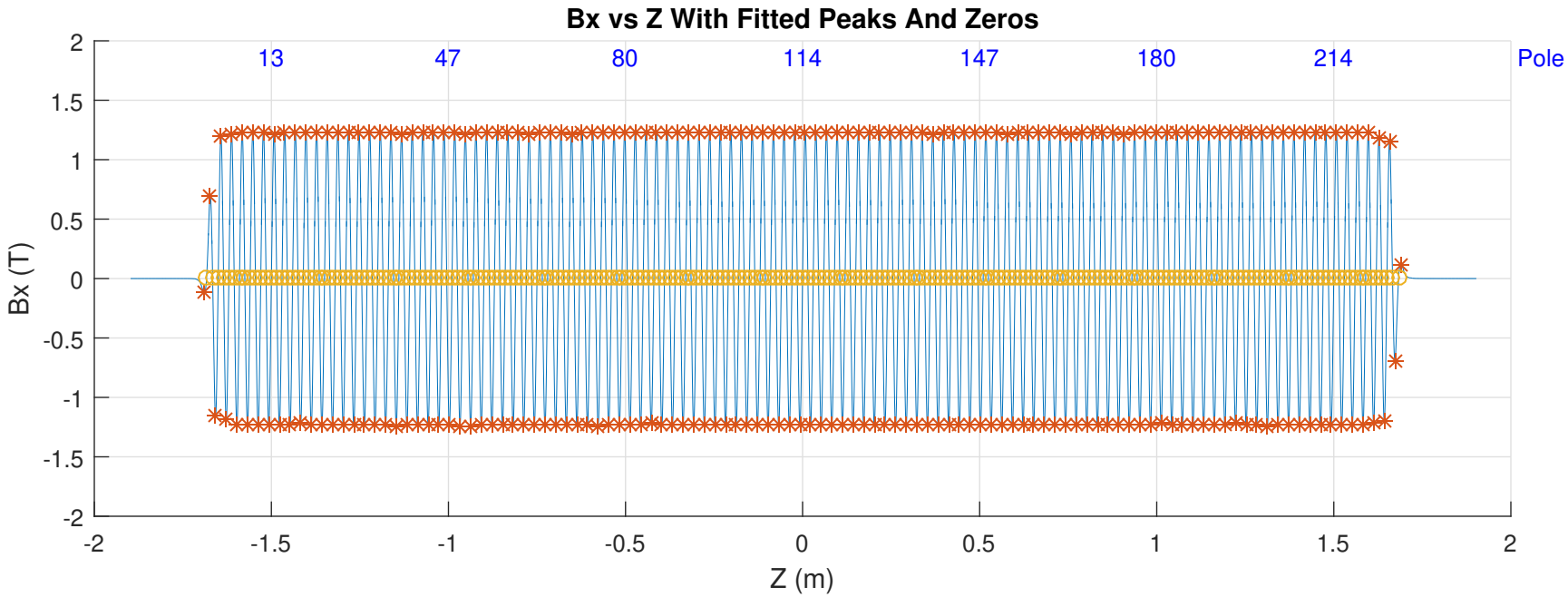
Planar Insertion Device Analysis

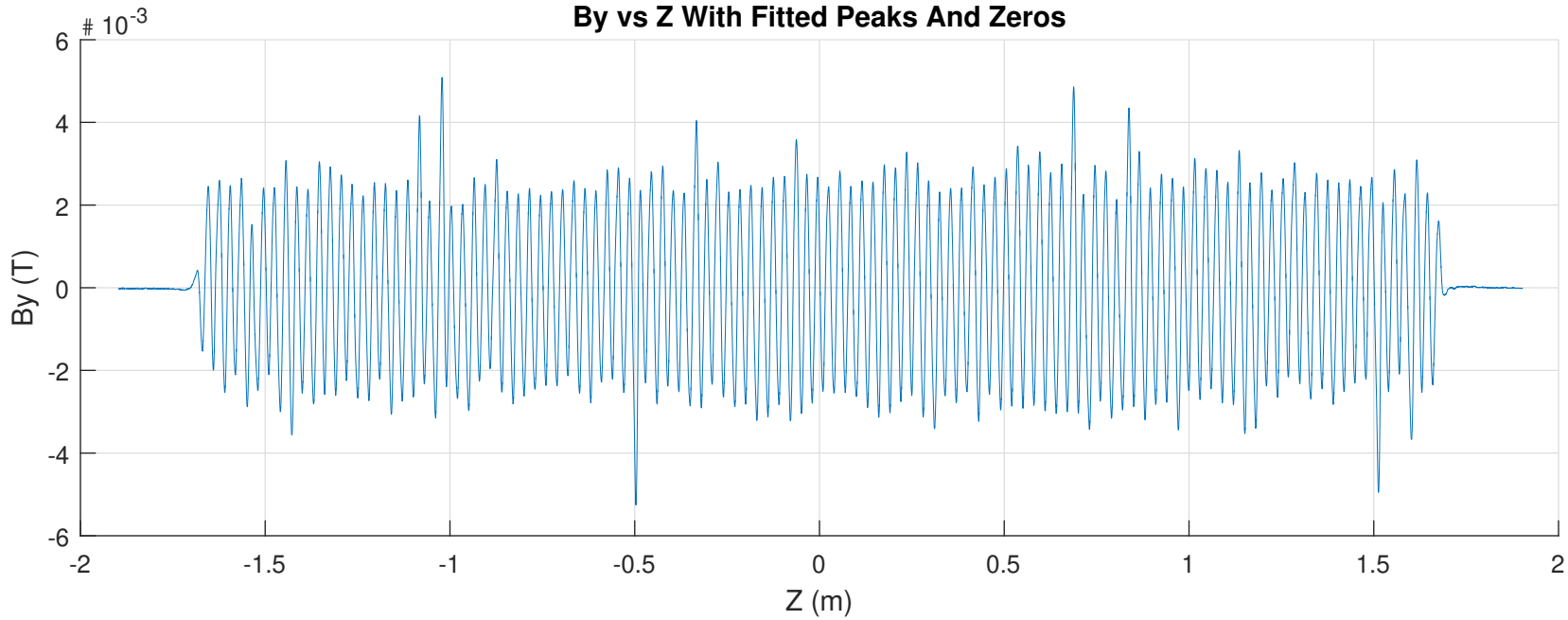
Parameters:
INPUT-FILE-DIR =s:\magdata\LCLS-II\Undulator\HXR-REFERENCE\DATASET0001\Tuning\Z Scans\Run 010\
INPUT-FILE-NAME =x+00000-y+000-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =1
GAMMA =26398
NOM-LAMBDA-U =0.03
NOM-K-VALUE =3.4571
NOM-LAMBDA-R =1.3857e-09
NUM-POLES =226
NUM-END-POLES =6
CELL-LENGTH =3.656

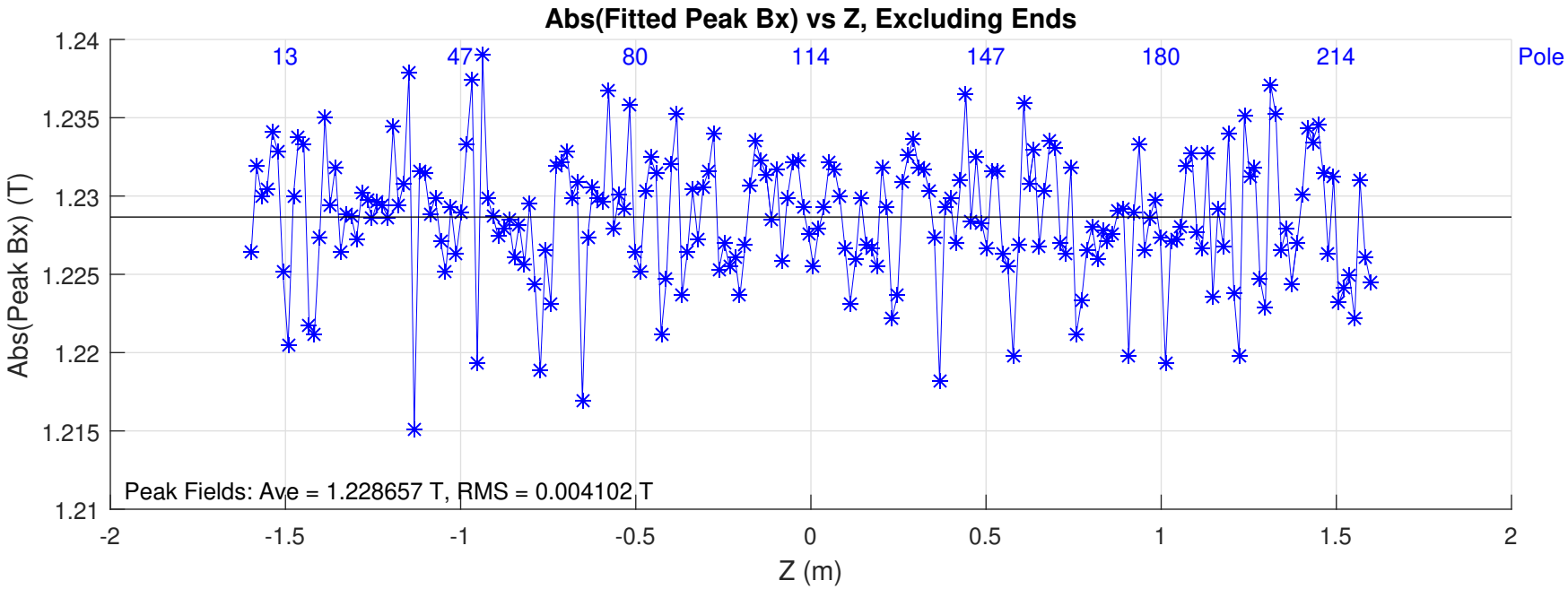

Bx Field Correction vs Zm
10^-6
6.00000000001
6
5.99999999999
5.99999999998
5.99999999997
5.99999999996
5.99999999995
Bx Corr (T)
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
By Field Correction vs Zm
10^-5
-2.4999999999998
-2.4999999999999
-2.5
-2.5000000000001
-2.5000000000002
By Corr (T)
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
Zm Measurement Position (m)

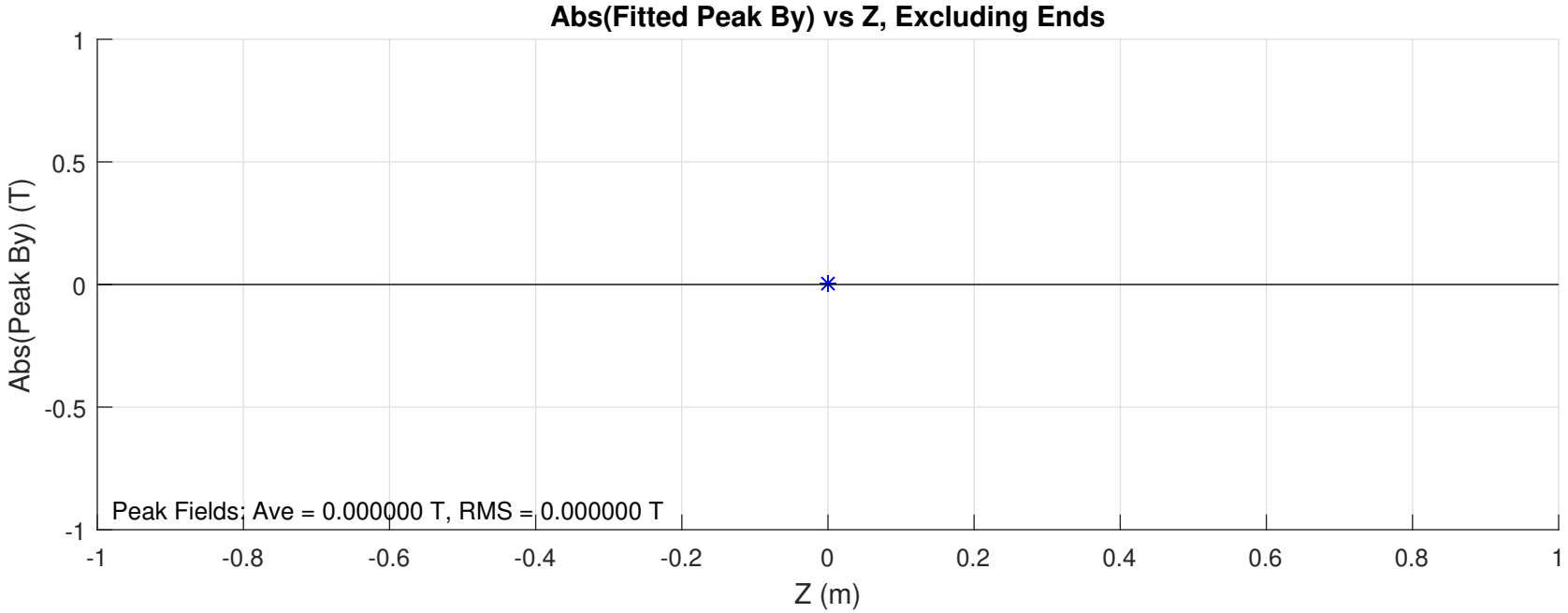

Bx vs Z
13
46
80
113
146
180
213
Pole
1.5
1
0.5
0
-0.5
-1
-1.5
Bx (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

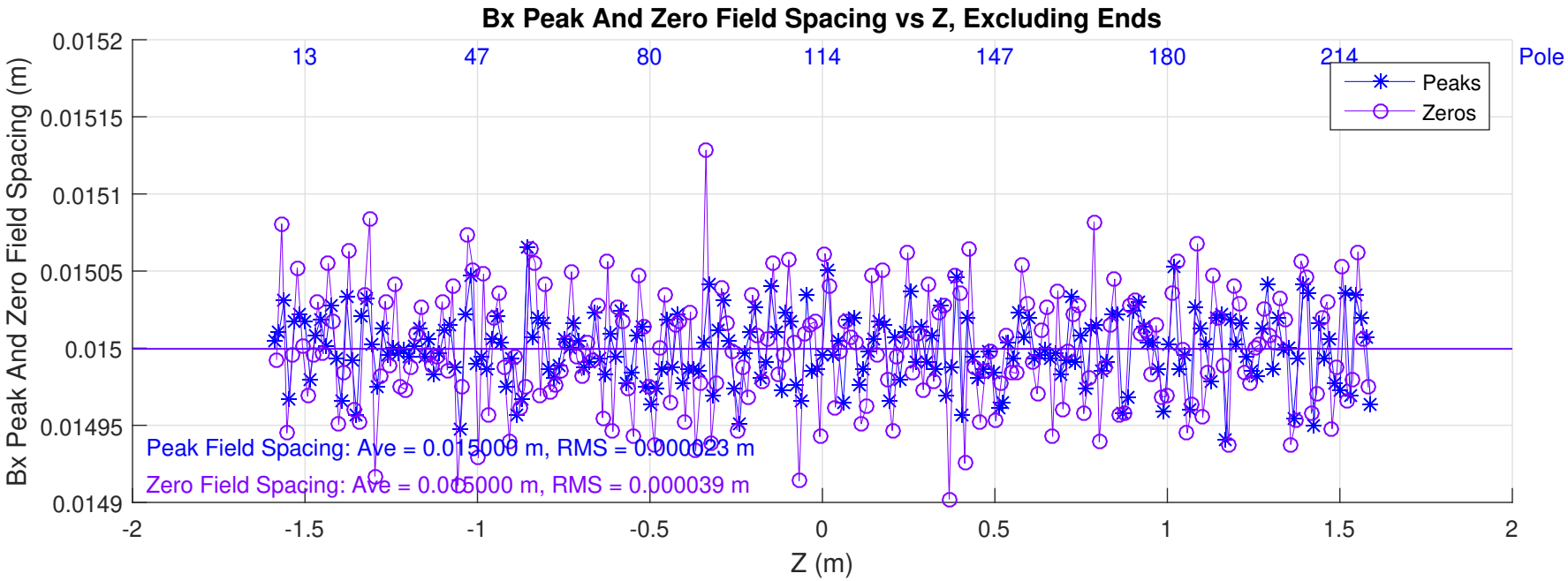

By vs Z
10^-3
6
4
2
0
-2
-4
-6
13
46
80
113
146
180
213
Pole
By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

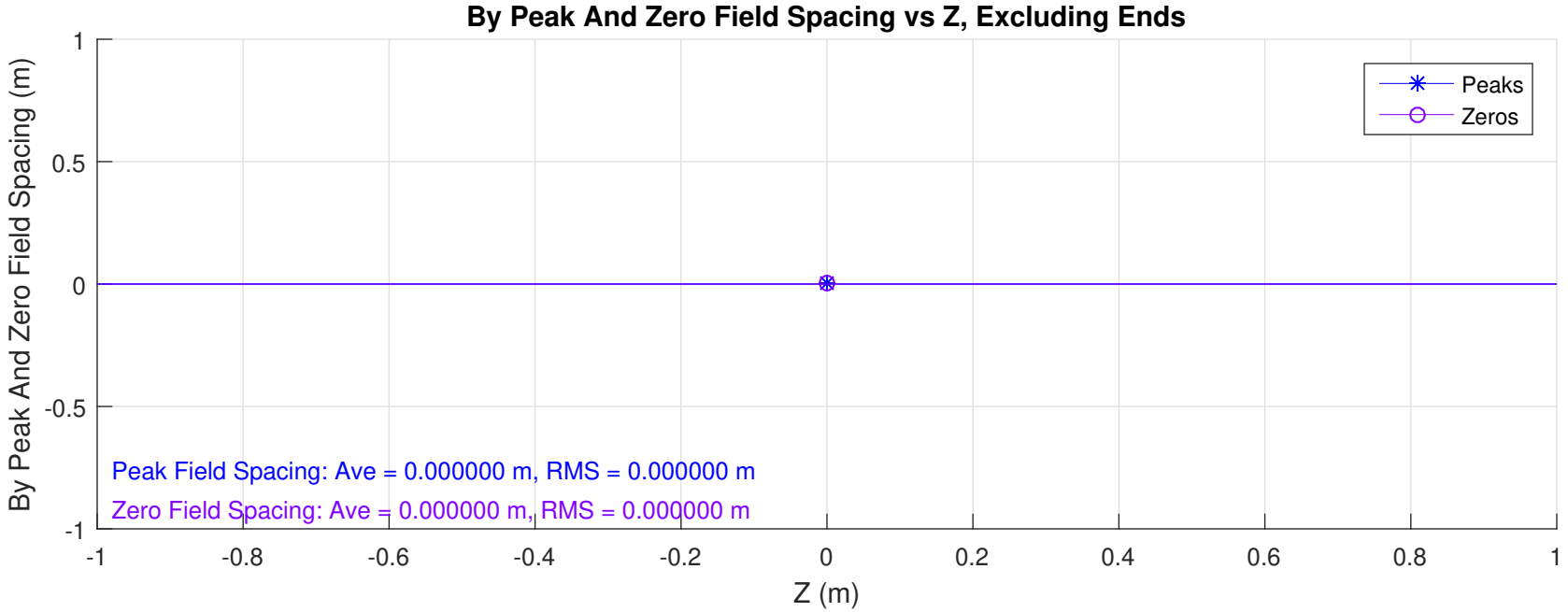

Bx vs Z With Fitted Peaks And Zeros
13
47
80
114
147
180
214
Pole
Bx (T)
Z (m)

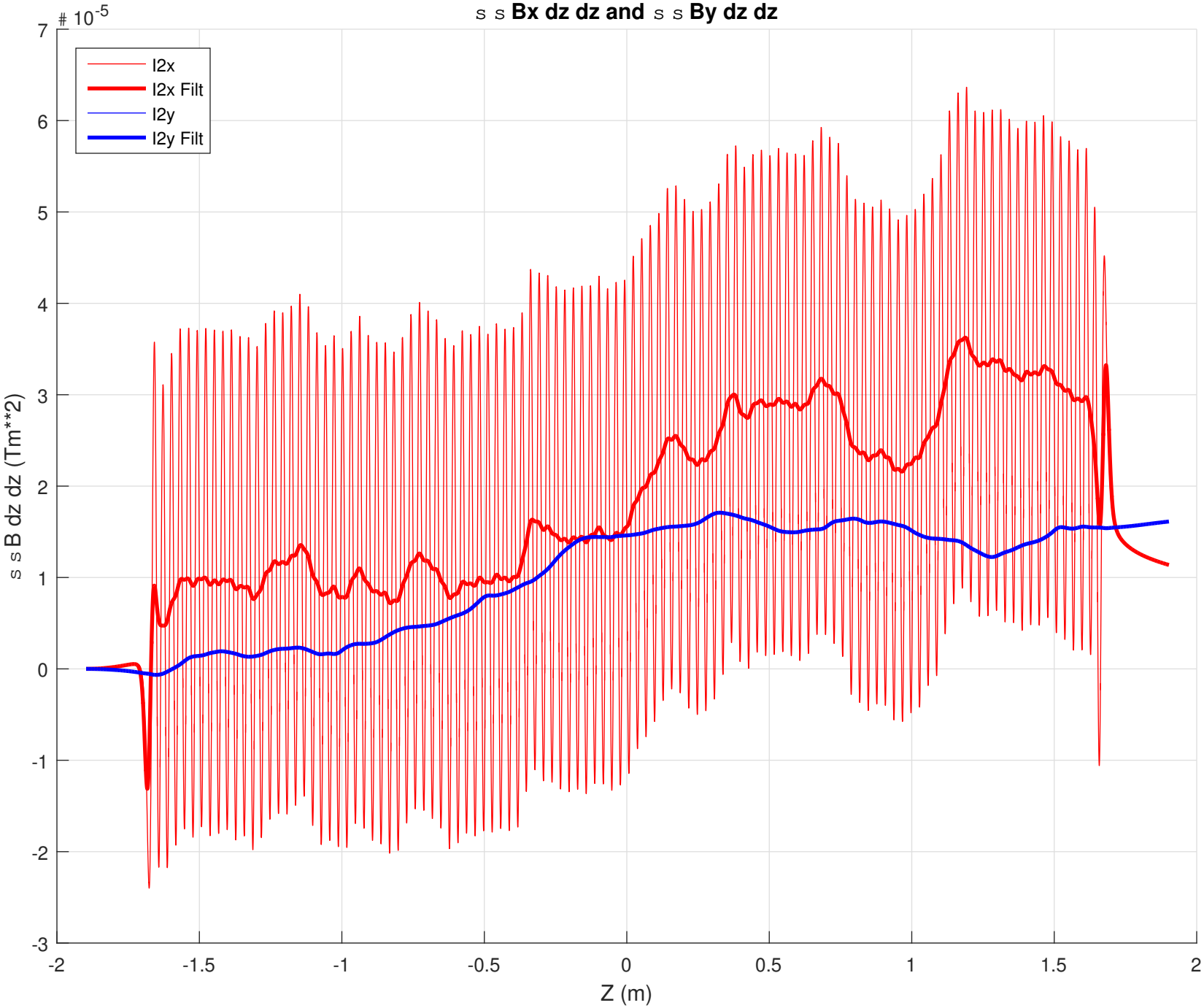

By vs Z With Fitted Peaks And Zeros
10^-3
By (T)
Z (m)

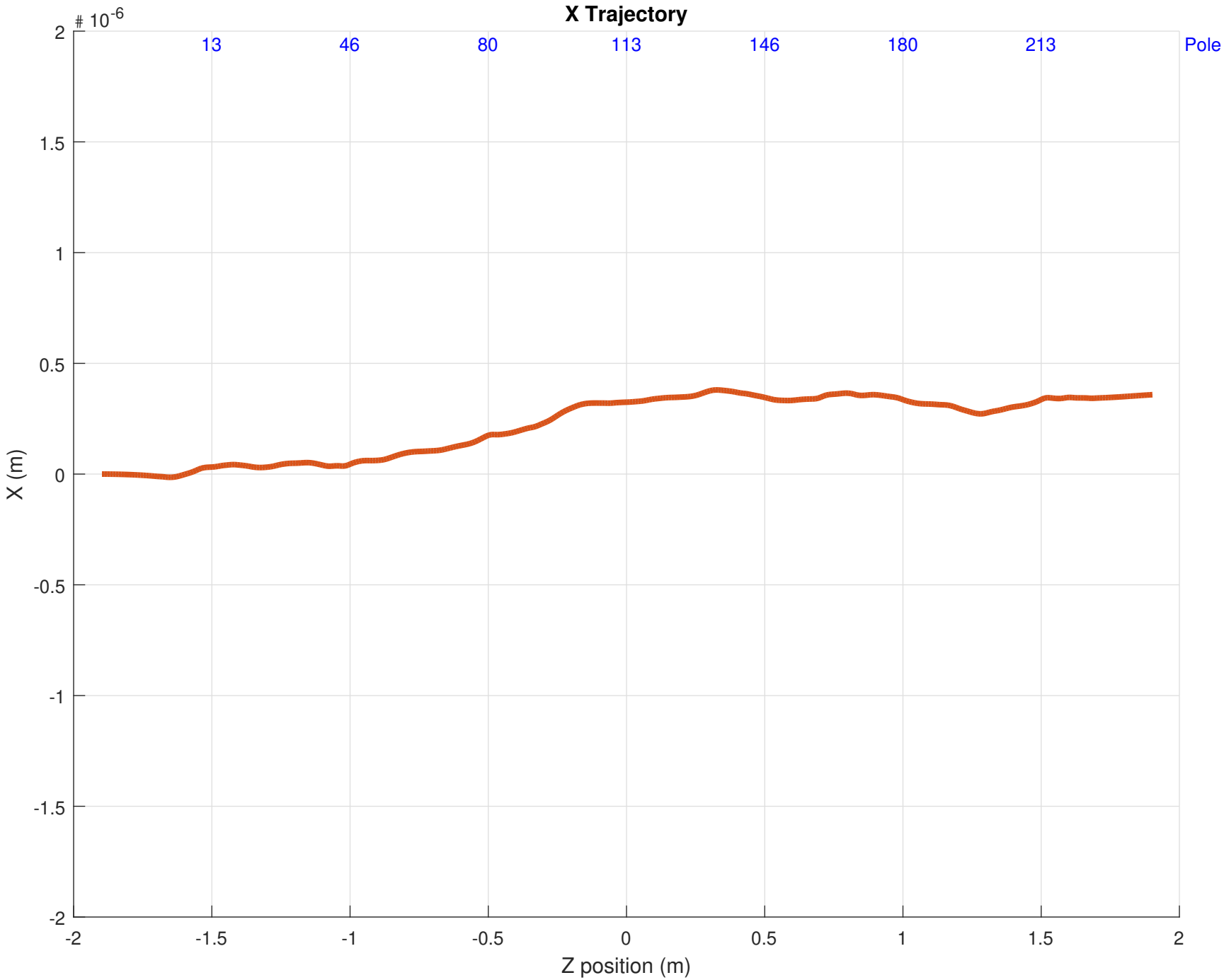

Abs(Fitted Peak Bx) vs Z, Excluding Ends
13
47
80
114
147
180
214
Pole
1.24
1.235
1.23
1.225
1.22
1.215
1.21
Abs(Peak Bx) (T)
Peak Fields: Ave = 1.228657 T, RMS = 0.004102 T
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

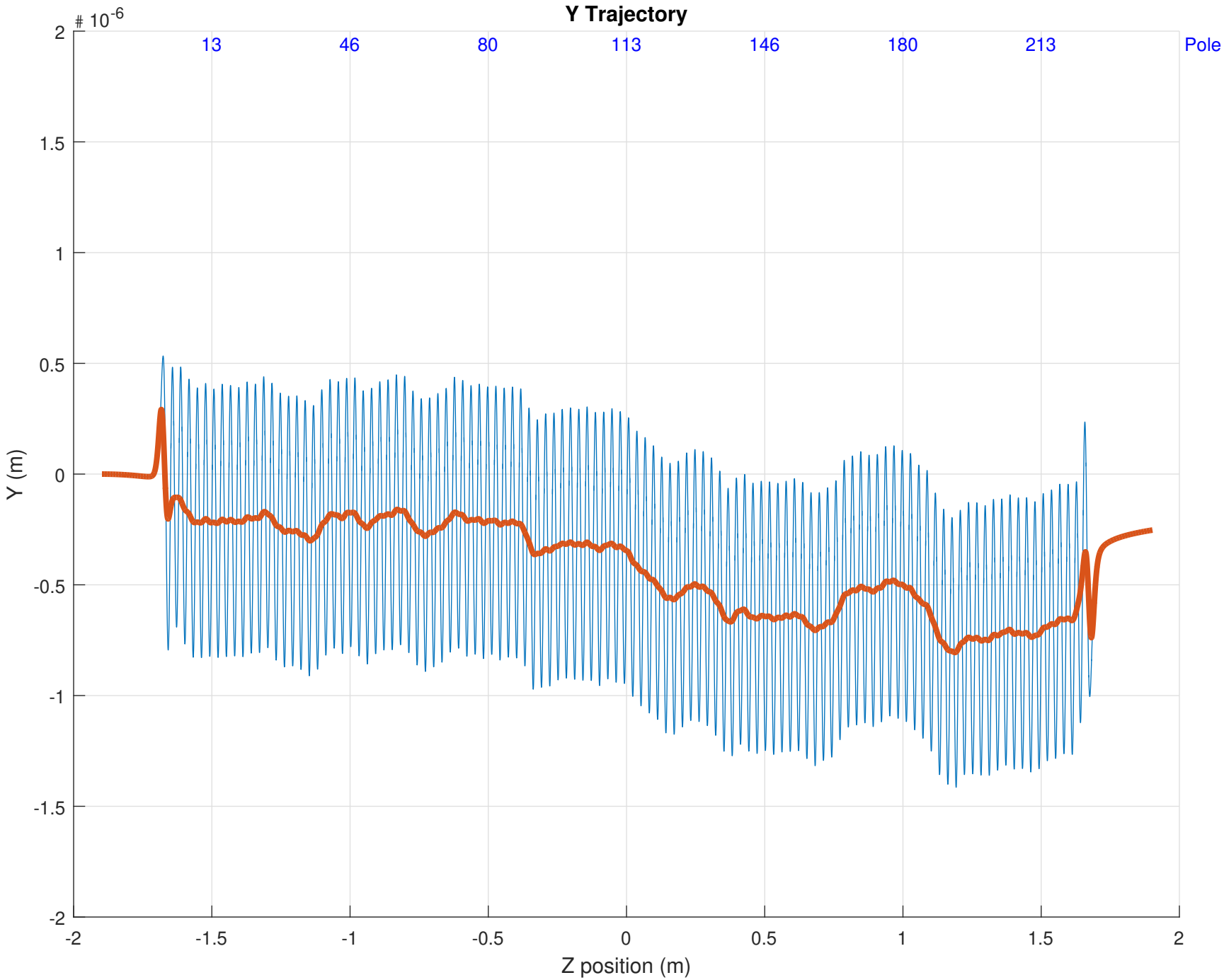

Abs(Fitted Peak By) vs Z, Excluding Ends
1
0.5
0
-0.5
-1
Abs(Peak By) (T)
Peak Fields: Ave = 0.000000 T, RMS = 0.000000 T
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
Z (m)

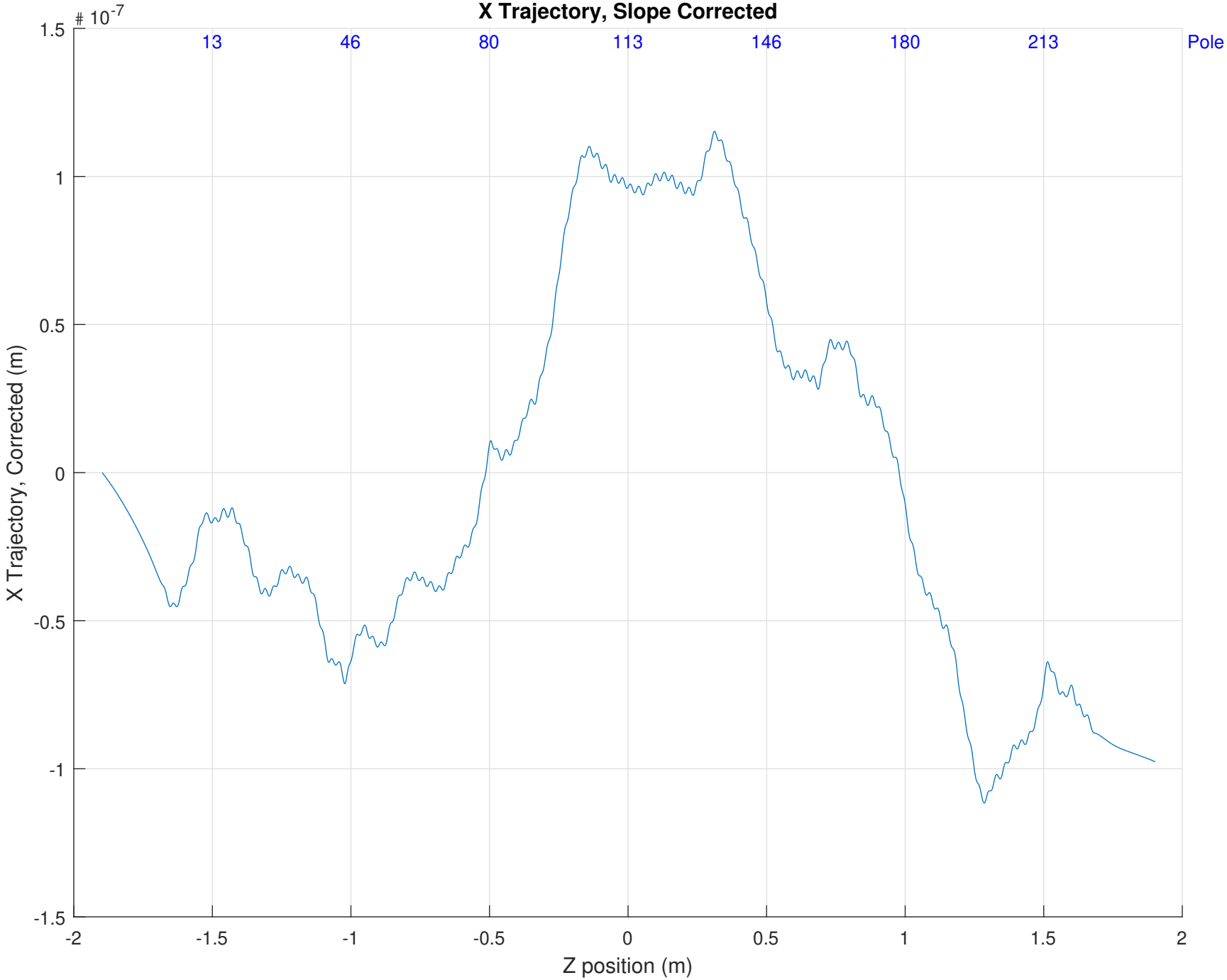

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
0.0152
0.01515
0.0151
0.01505
0.015
0.01495
0.0149
13
47
80
114
147
180
214
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.015000 m, RMS = 0.000023 m
Zero Field Spacing: Ave = 0.015000 m, RMS = 0.000039 m
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

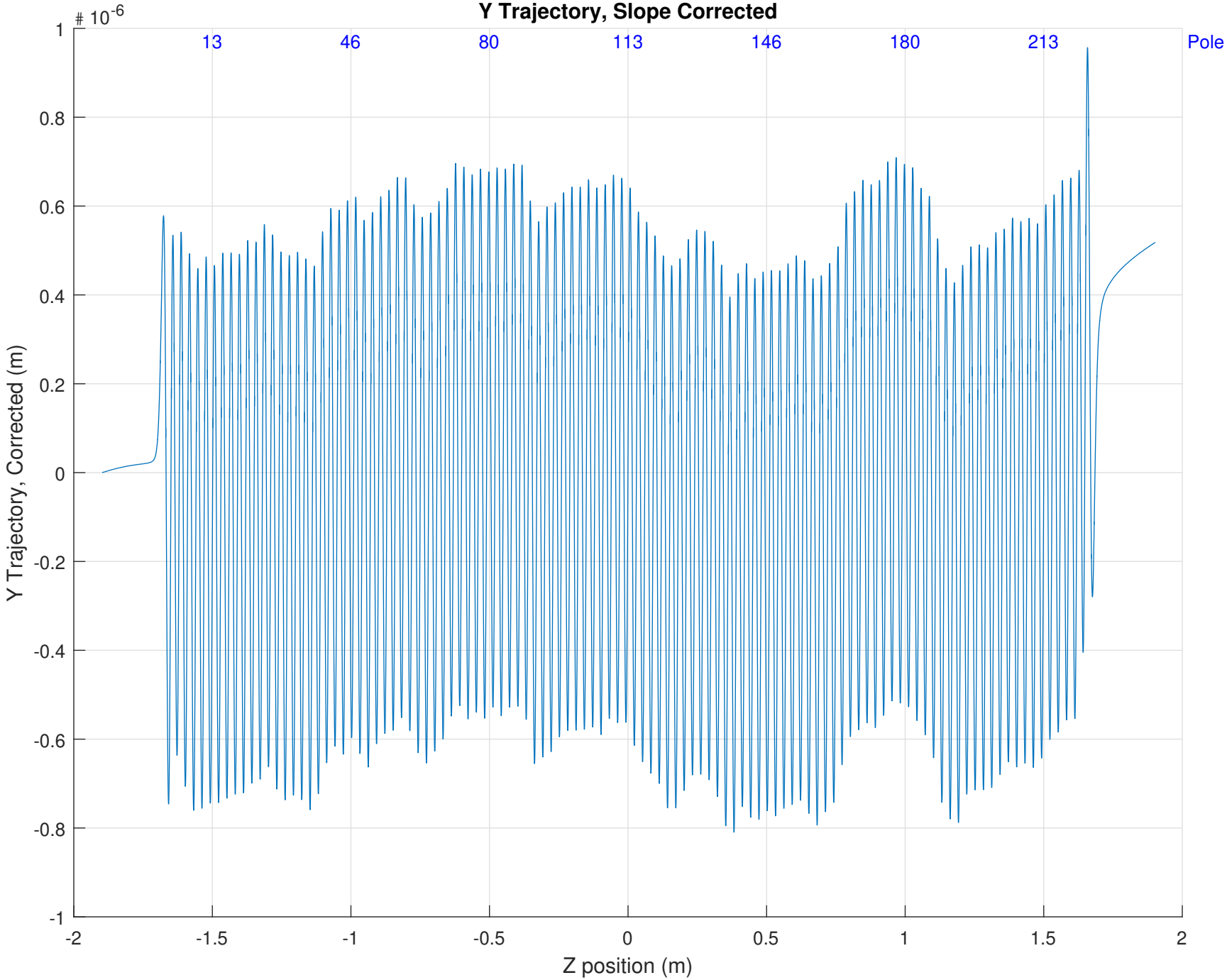

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
1
0.5
0
-0.5
-1
Peaks
Zeros
Peak Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
Zero Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
Z (m)

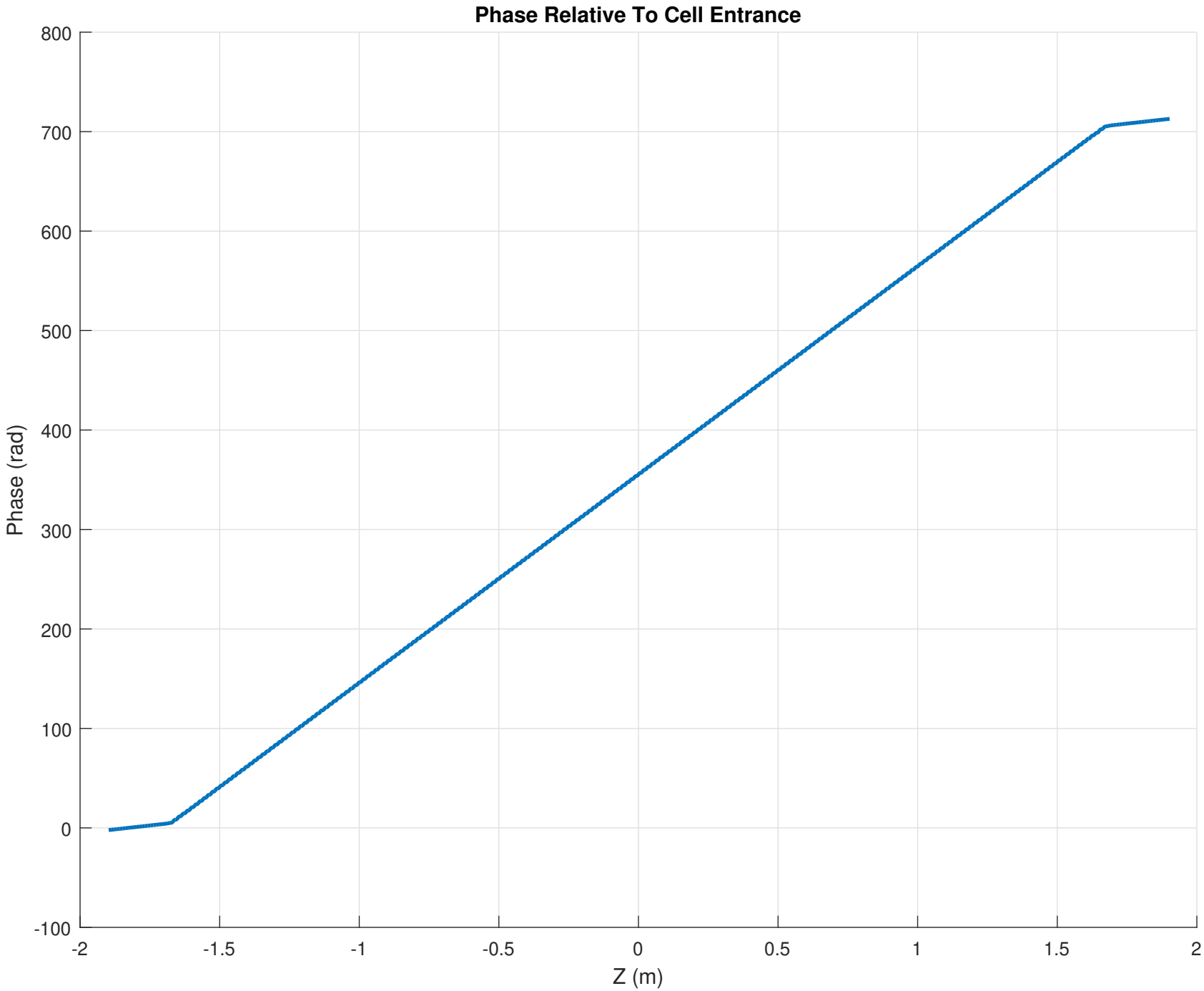

s s Bx dz dz and s s By dz dz
10^-5
I2x
I2x Filt
I2y
I2y Filt
s s B dz dz (Tm**2)
Z (m)
7
6
5
4
3
2
1
0
-1
-2
-3
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

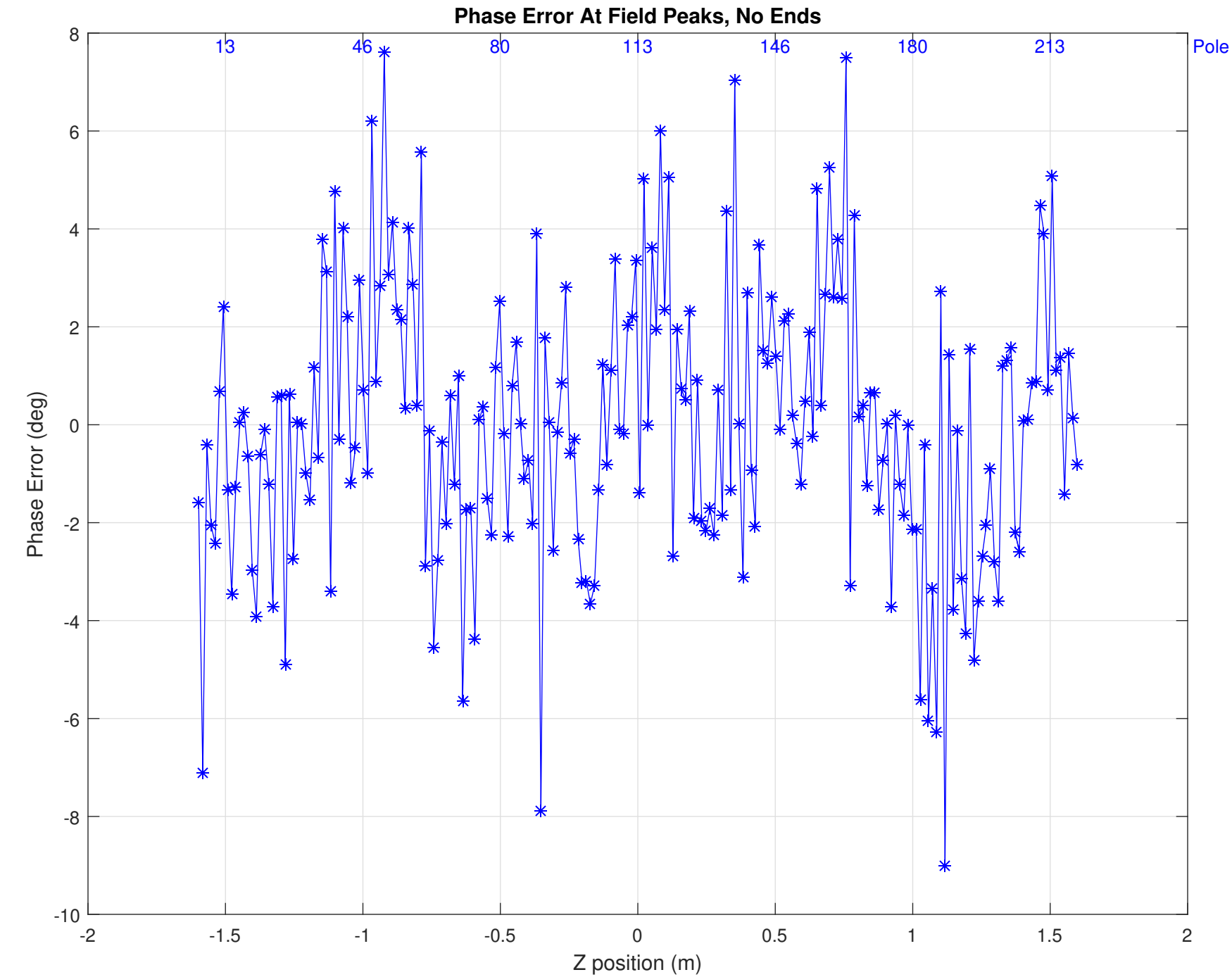

X Trajectory
10-6
13
46
80
113
146
180
213
Pole
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
X (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)


Y Trajectory
10^-6
13
46
80
113
146
180
213
Pole
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
Y (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)

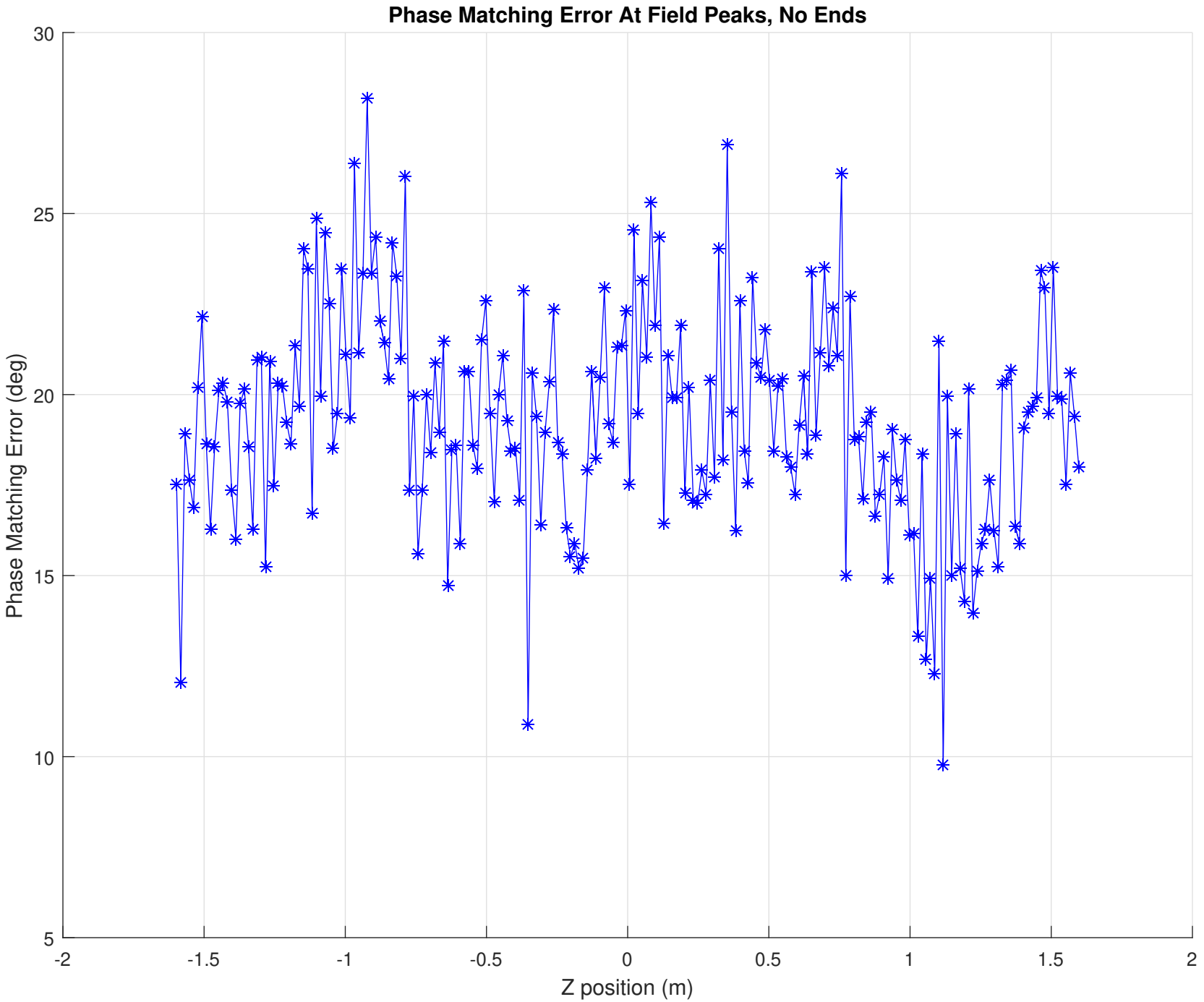

X Trajectory, Slope Corrected
10^-7
1.5
1
0.5
0
-0.5
-1
-1.5
X Trajectory, Corrected (m)
13
46
80
113
146
180
213
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)


Y Trajectory, Slope Corrected
10^-6
13
46
80
113
146
180
213
Pole
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
Y Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)

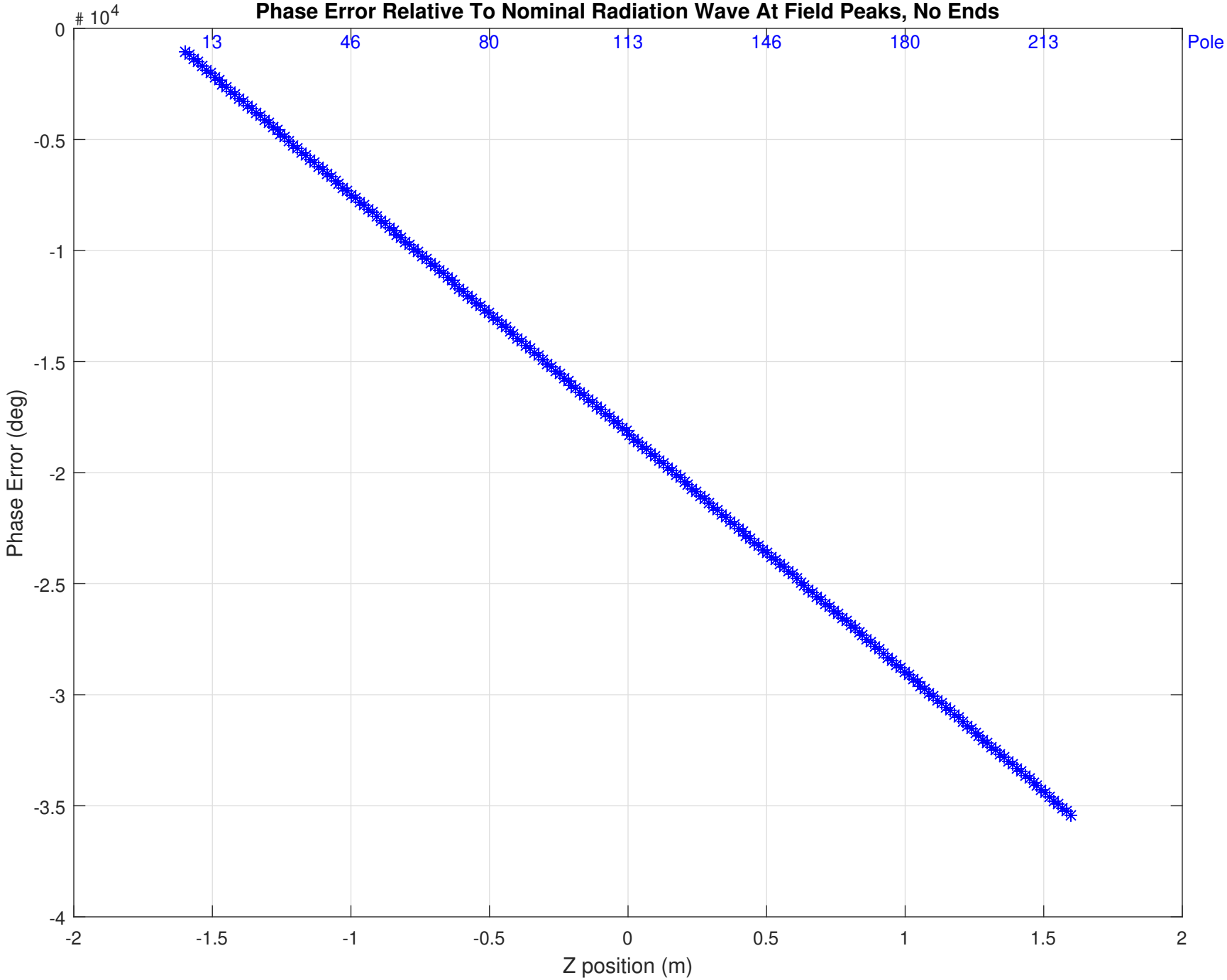

Phase Relative To Cell Entrance
800
700
600
500
400
300
200
100
0
-100
Phase (rad)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)



Phase Error: Ave = -0.000000 deg, RMS = 2.799404 deg



Phase Match Error: Ave = 19.354486 deg, RMS = 2.957250 deg


Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
10^4
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
13
46
80
113
146
180
213
Pole
Phase Error (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)