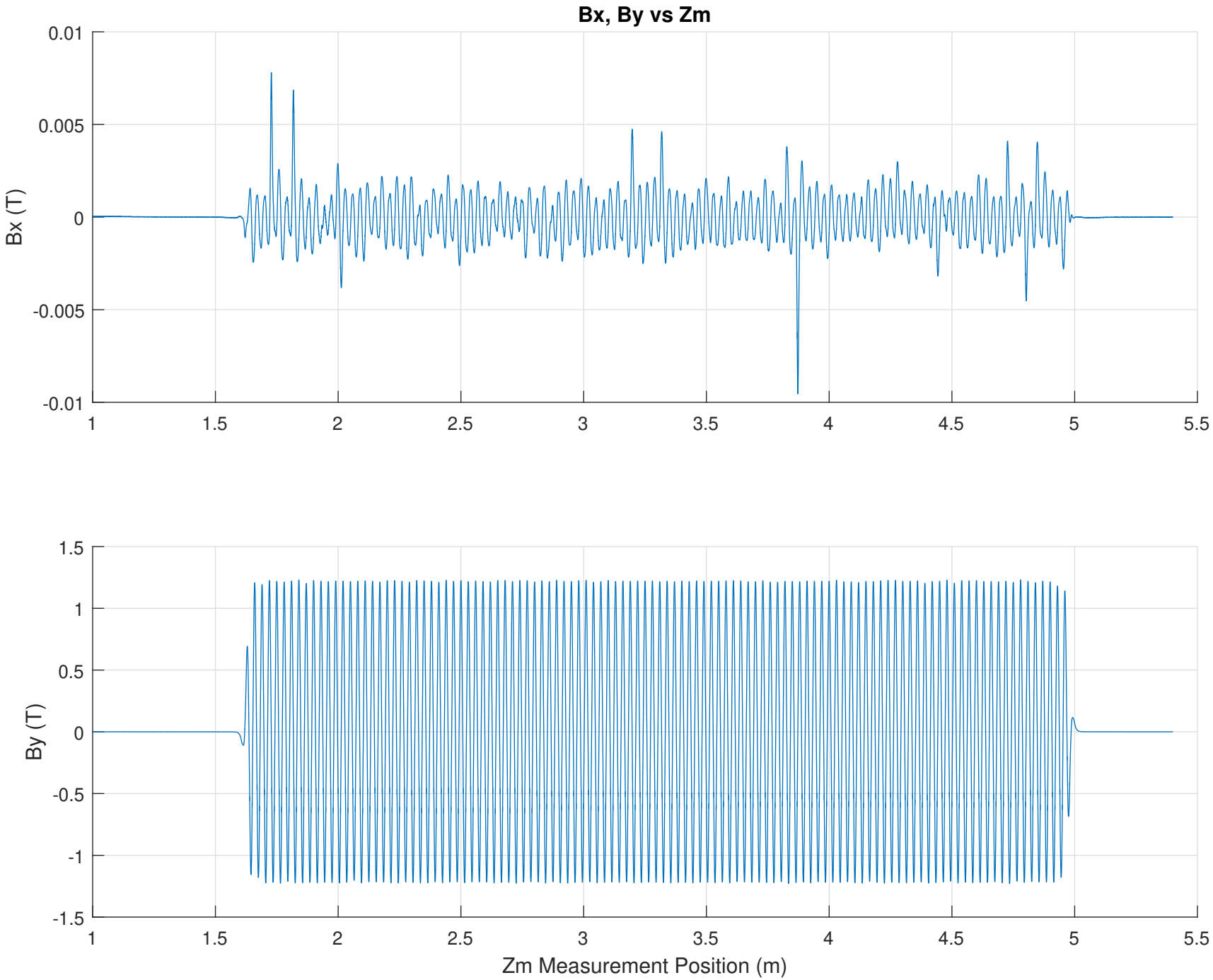
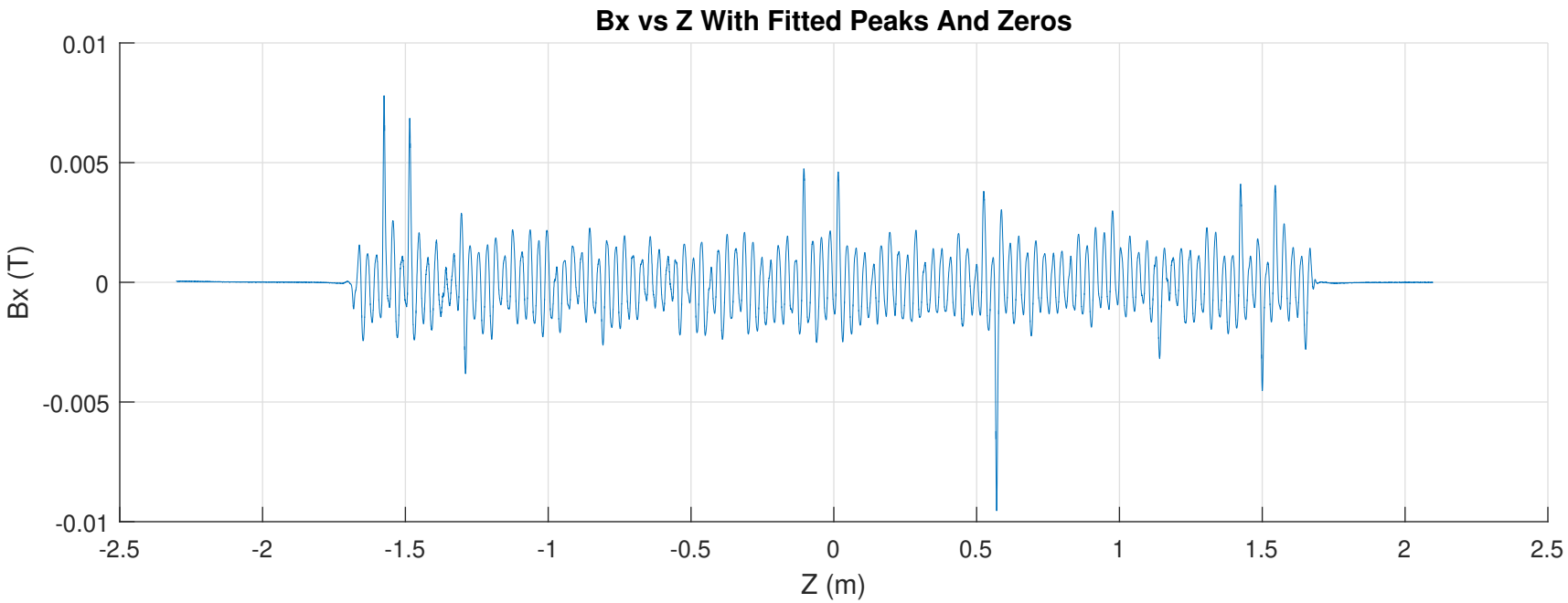
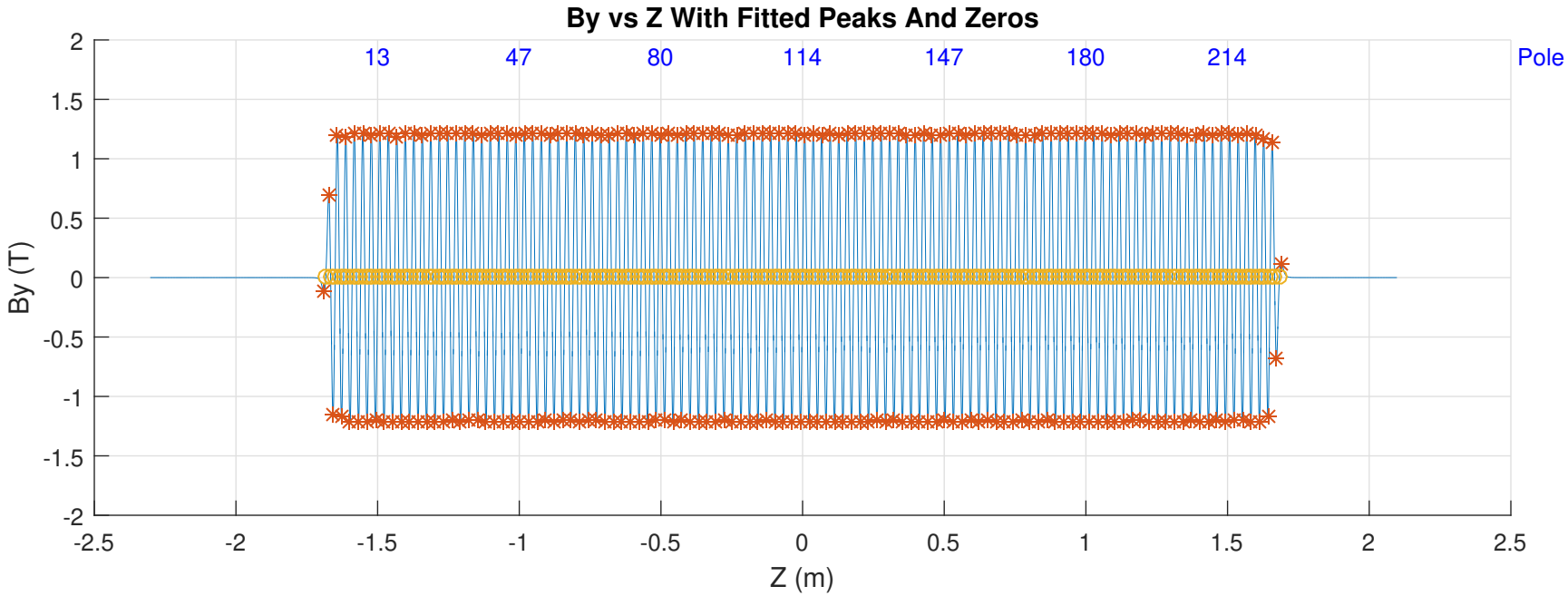
SLAC Magnetic Measurements

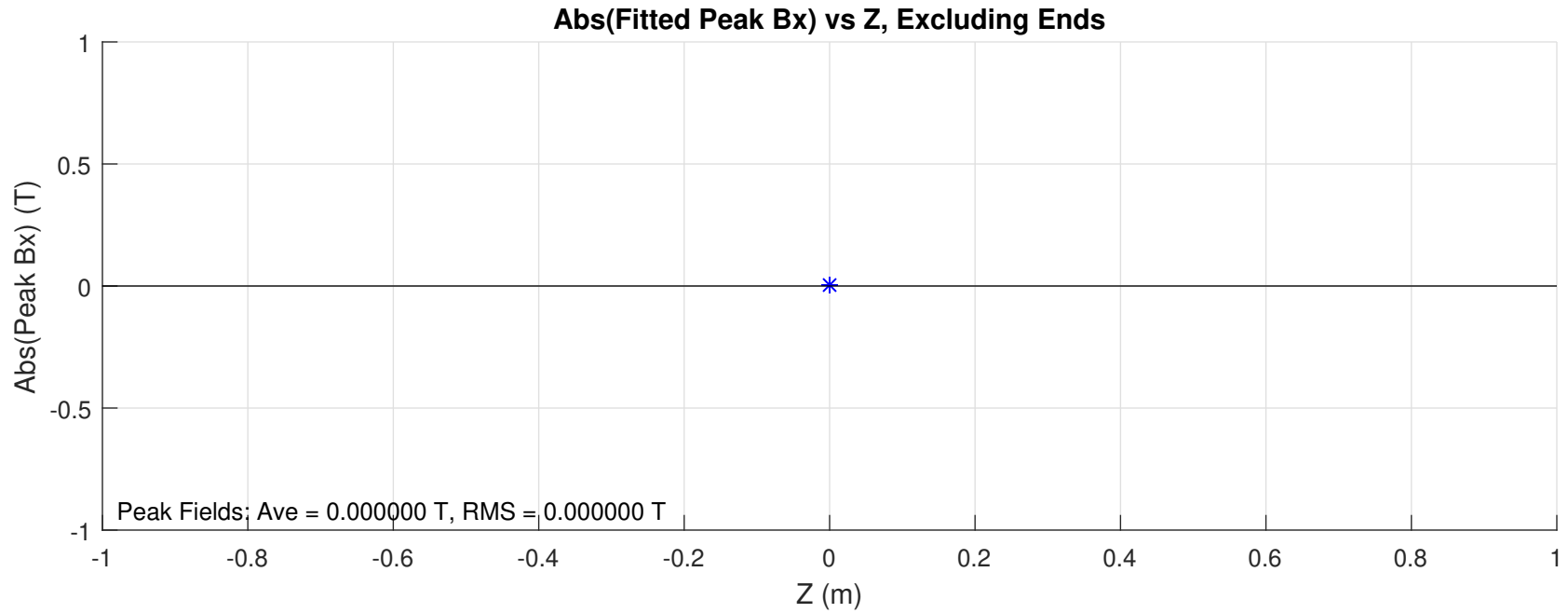
Planar Insertion Device Analysis

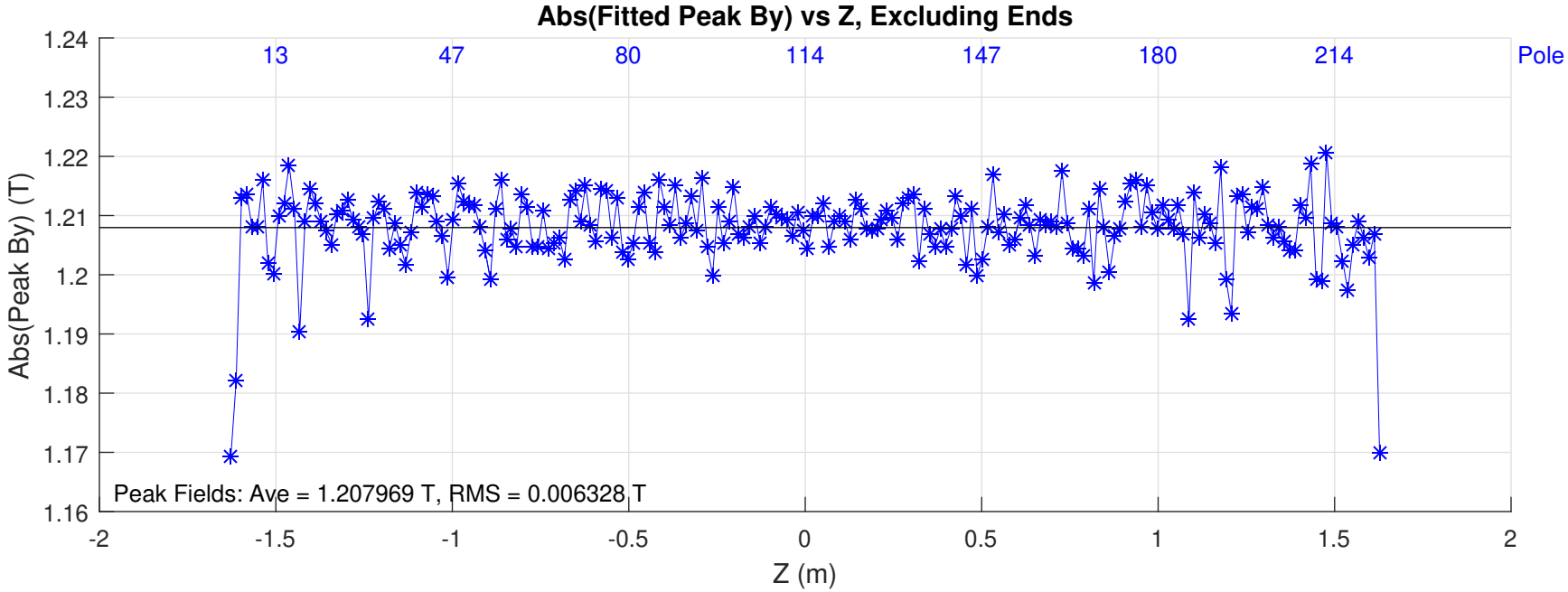
Parameters:
INPUT-FILE-DIR =S:\MagData\LCLS-II\Undulator\SXR-REFERENCE\DATASET0001\Tuning\Z Scans\Run 008\
INPUT-FILE-NAME =x+00000-y+000-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =0
GAMMA =26689
NOM-LAMBDA-U =0.03
NOM-K-VALUE =3.5
NOM-LAMBDA-R =1.5004e-10
NUM-POLES =226
NUM-END-POLES =4
CELL-LENGTH =3.656

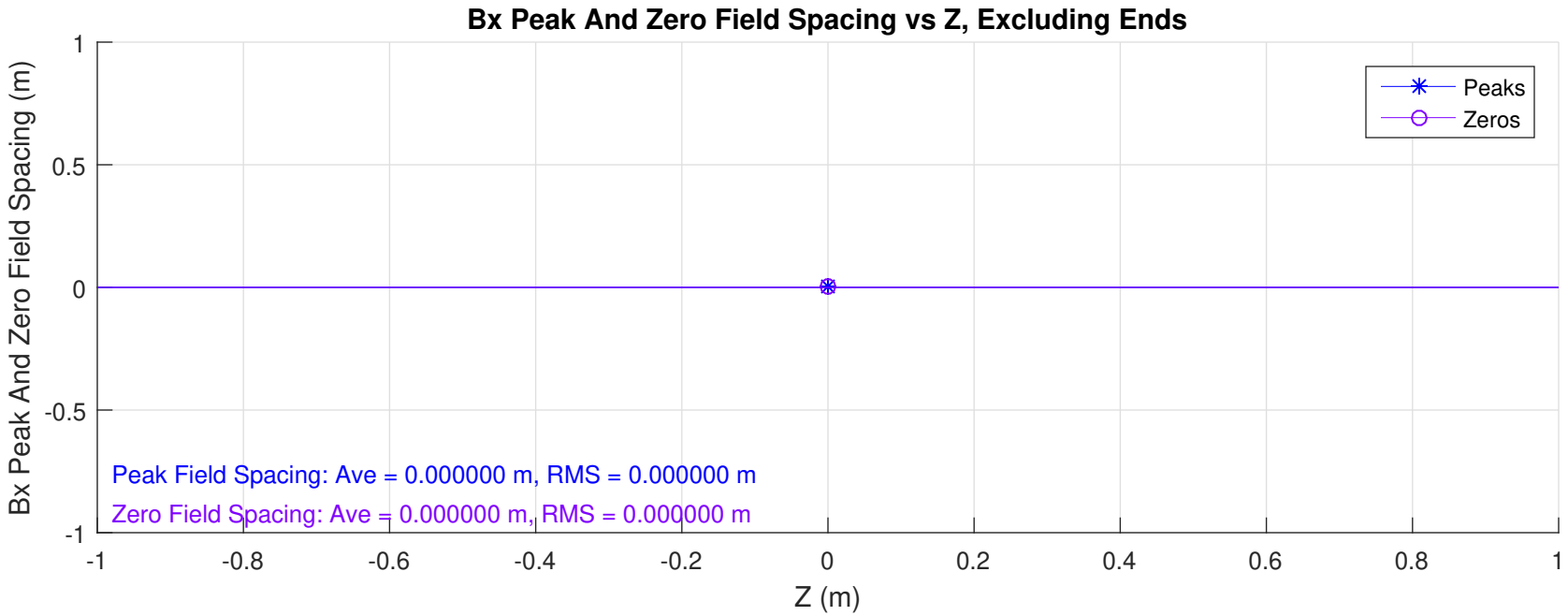

Bx, By vs Zm
Bx (T)
0.01
0.005
0
-0.005
-0.01
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
By (T)
1.5
1
0.5
0
-0.5
-1
-1.5
Zm Measurement Position (m)

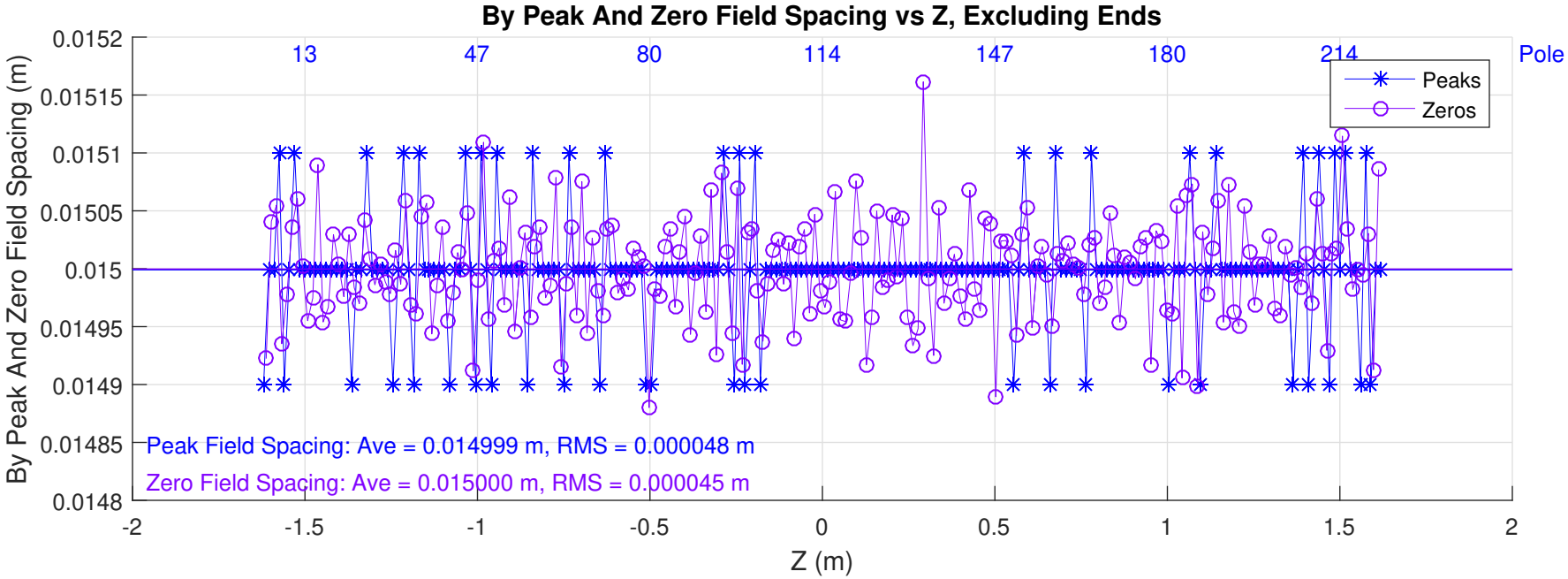

Bx vs Z With Fitted Peaks And Zeros
Bx (T)
Z (m)
0.01
0.005
0
-0.005
-0.01
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

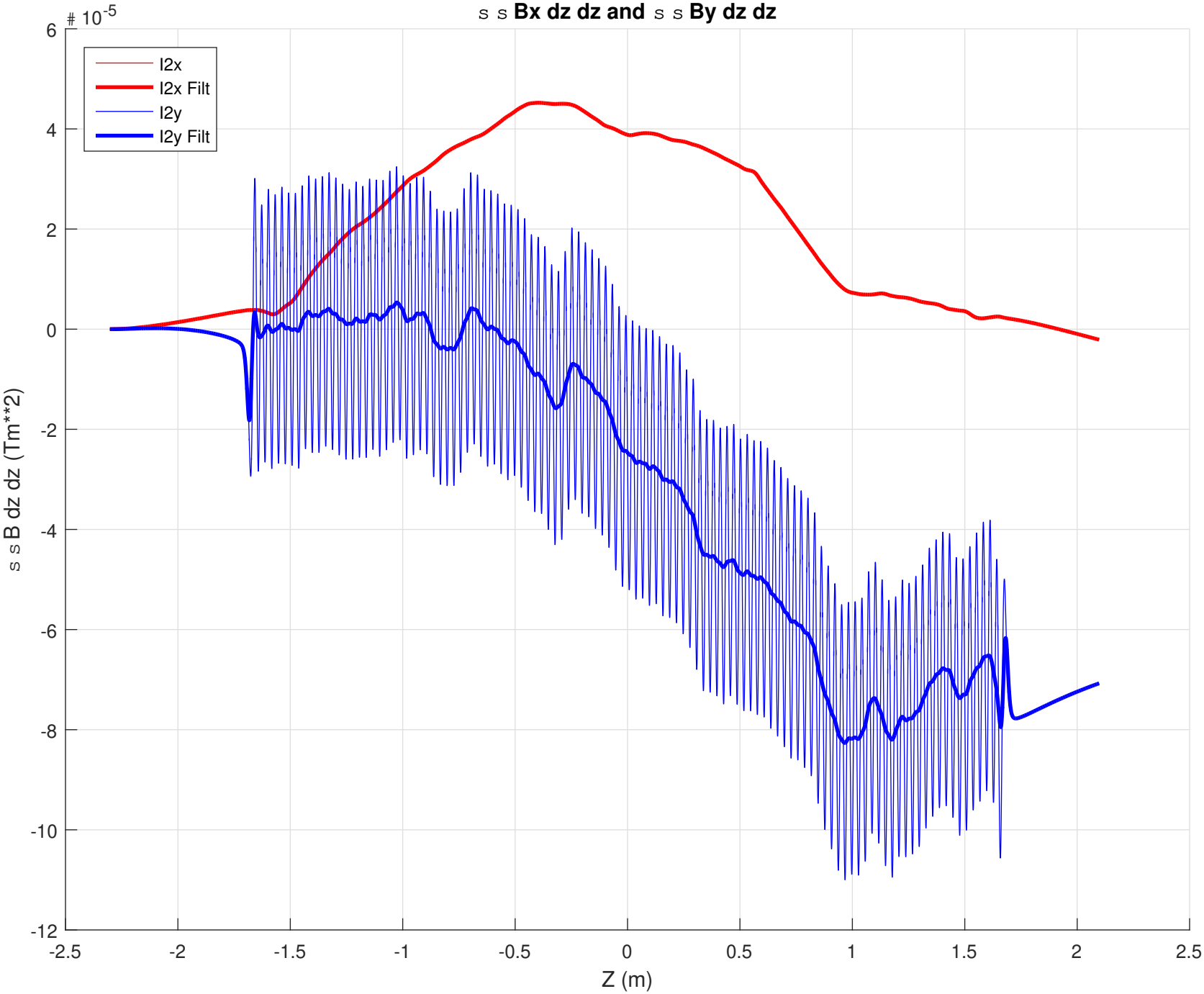

By vs Z With Fitted Peaks And Zeros
13
47
80
114
147
180
214
Pole
By (T)
Z (m)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

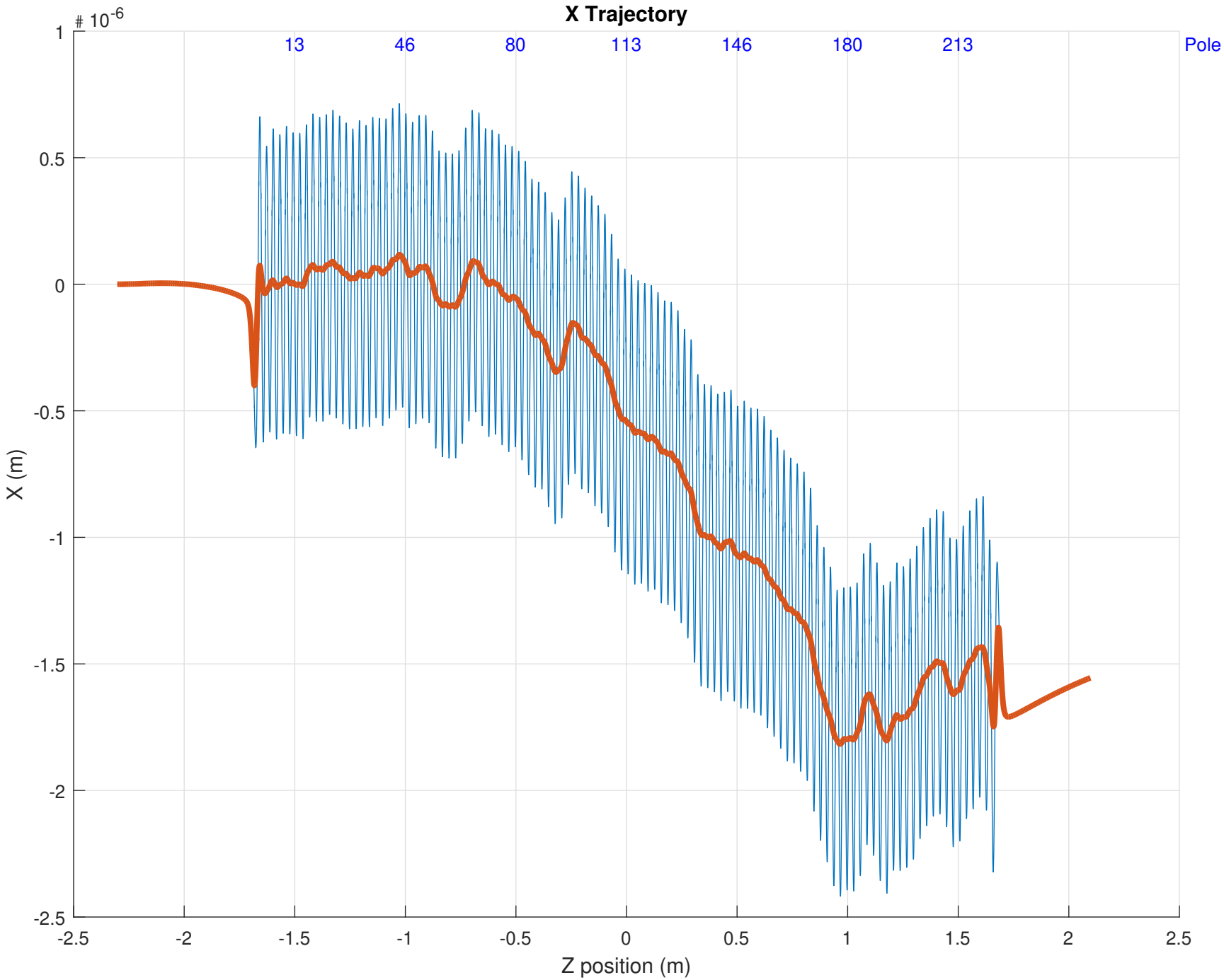

Abs(Fitted Peak Bx) vs Z, Excluding Ends
Abs(Peak Bx) (T)
Z (m)
Peak Fields: Ave = 0.000000 T, RMS = 0.000000 T
1
0.5
0
-0.5
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1

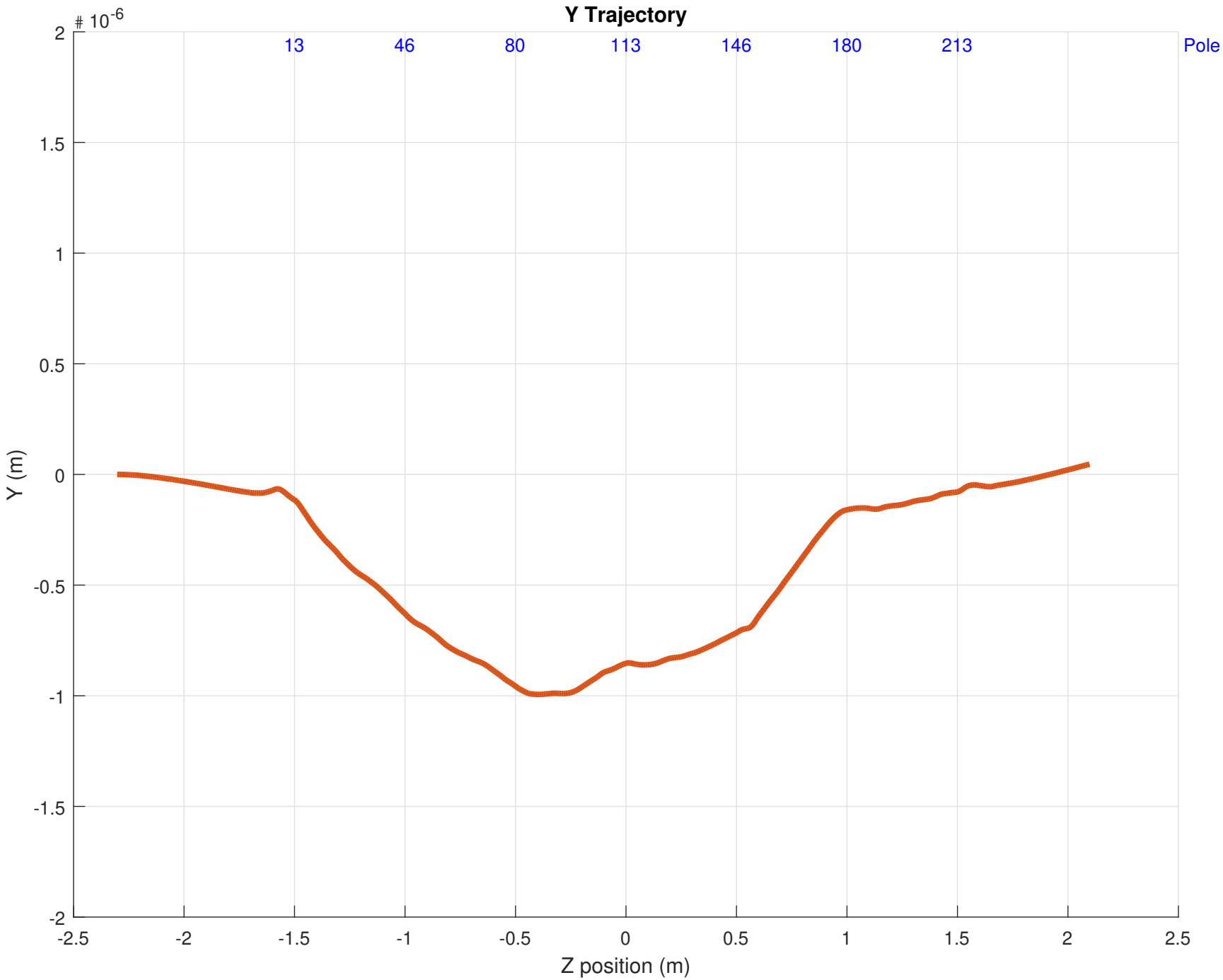

Abs(Fitted Peak By) vs Z, Excluding Ends
Abs(Peak By) (T)
Z (m)
Peak Fields: Ave = 1.207969 T, RMS = 0.006328 T
13
47
80
114
147
180
214
Pole
1.24
1.23
1.22
1.21
1.2
1.19
1.18
1.17
1.16
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

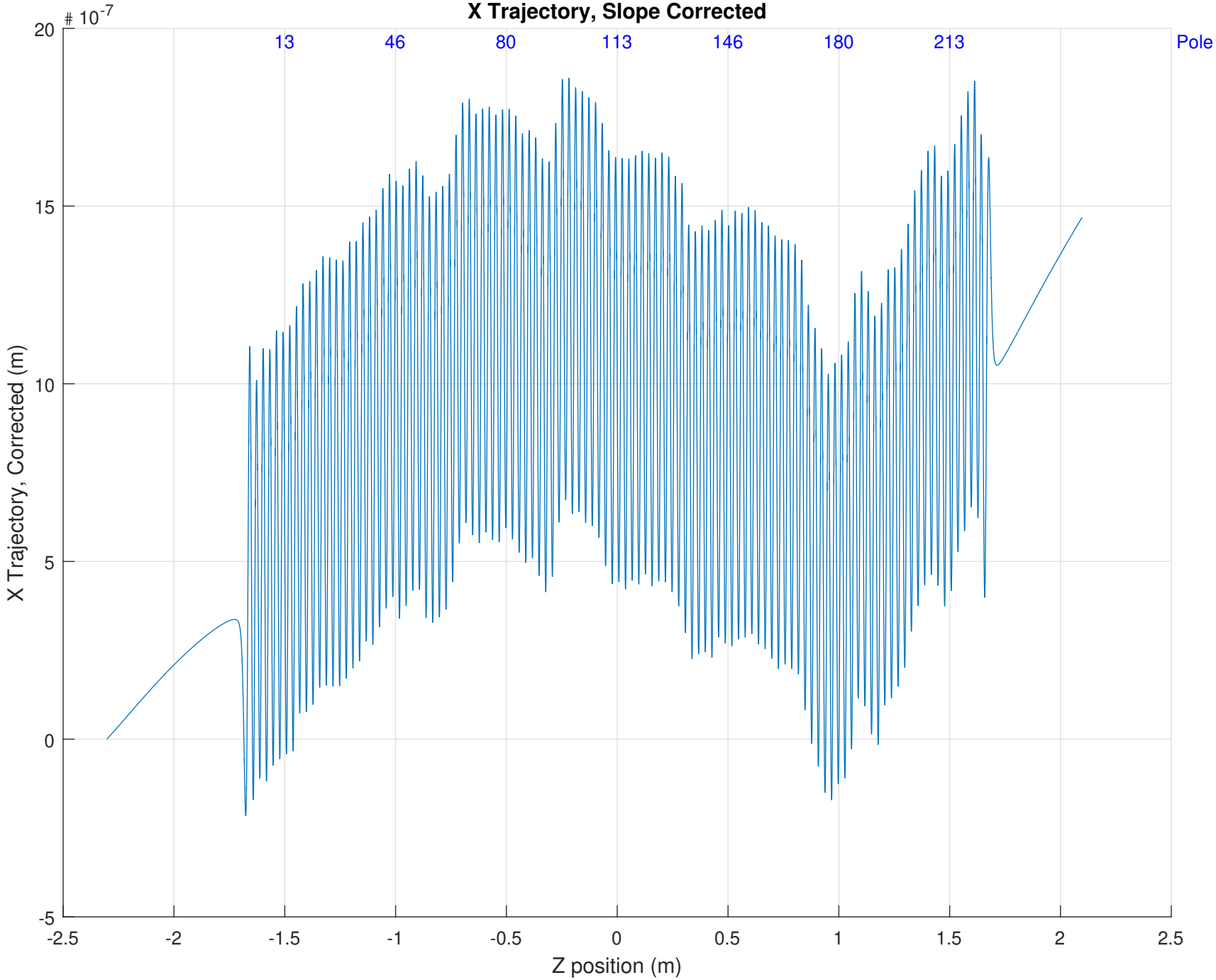

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Peaks
Zeros
Peak Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
Zero Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m

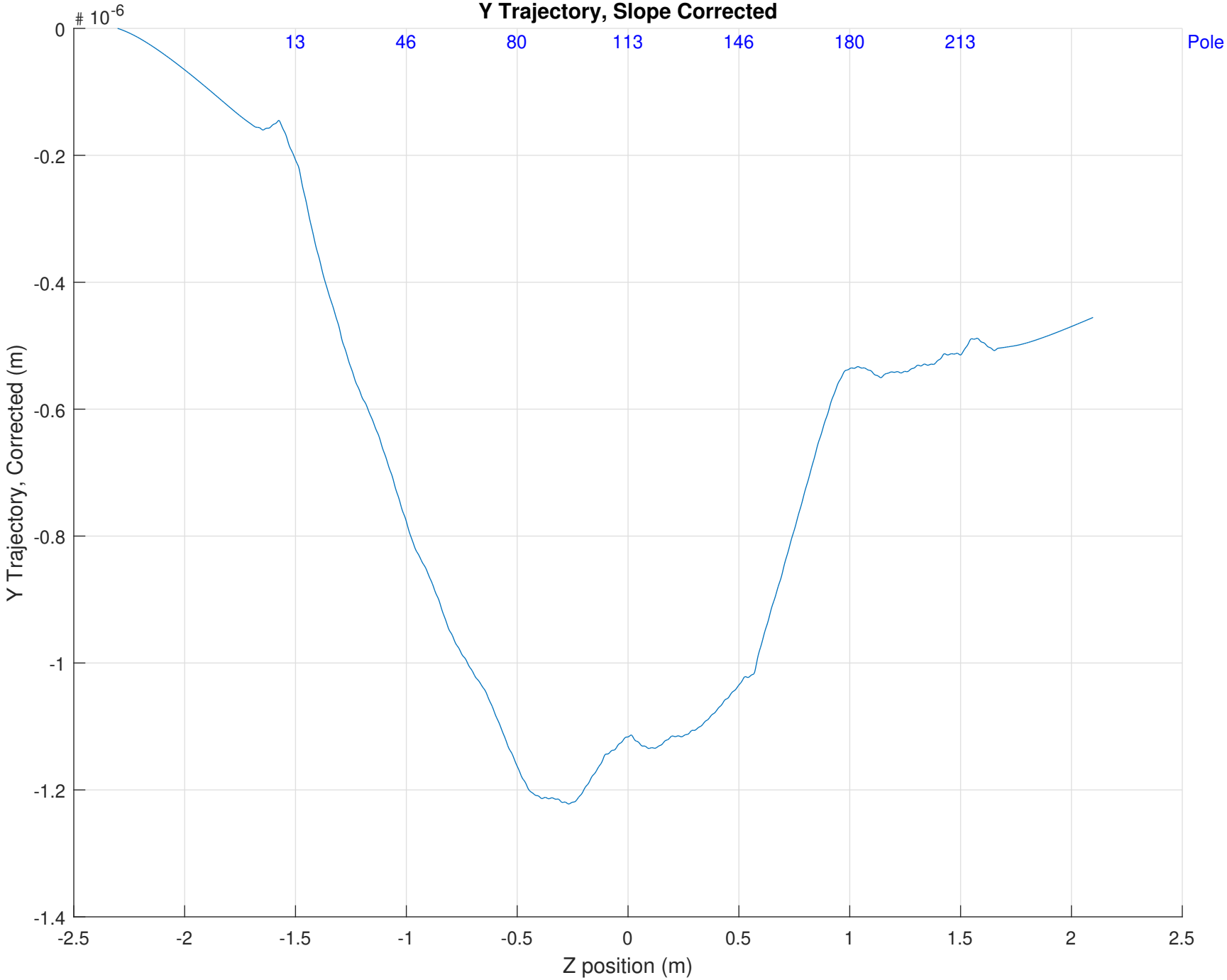

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
13
47
80
114
147
180
214
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.014999 m, RMS = 0.000048 m
Zero Field Spacing: Ave = 0.015000 m, RMS = 0.000045 m

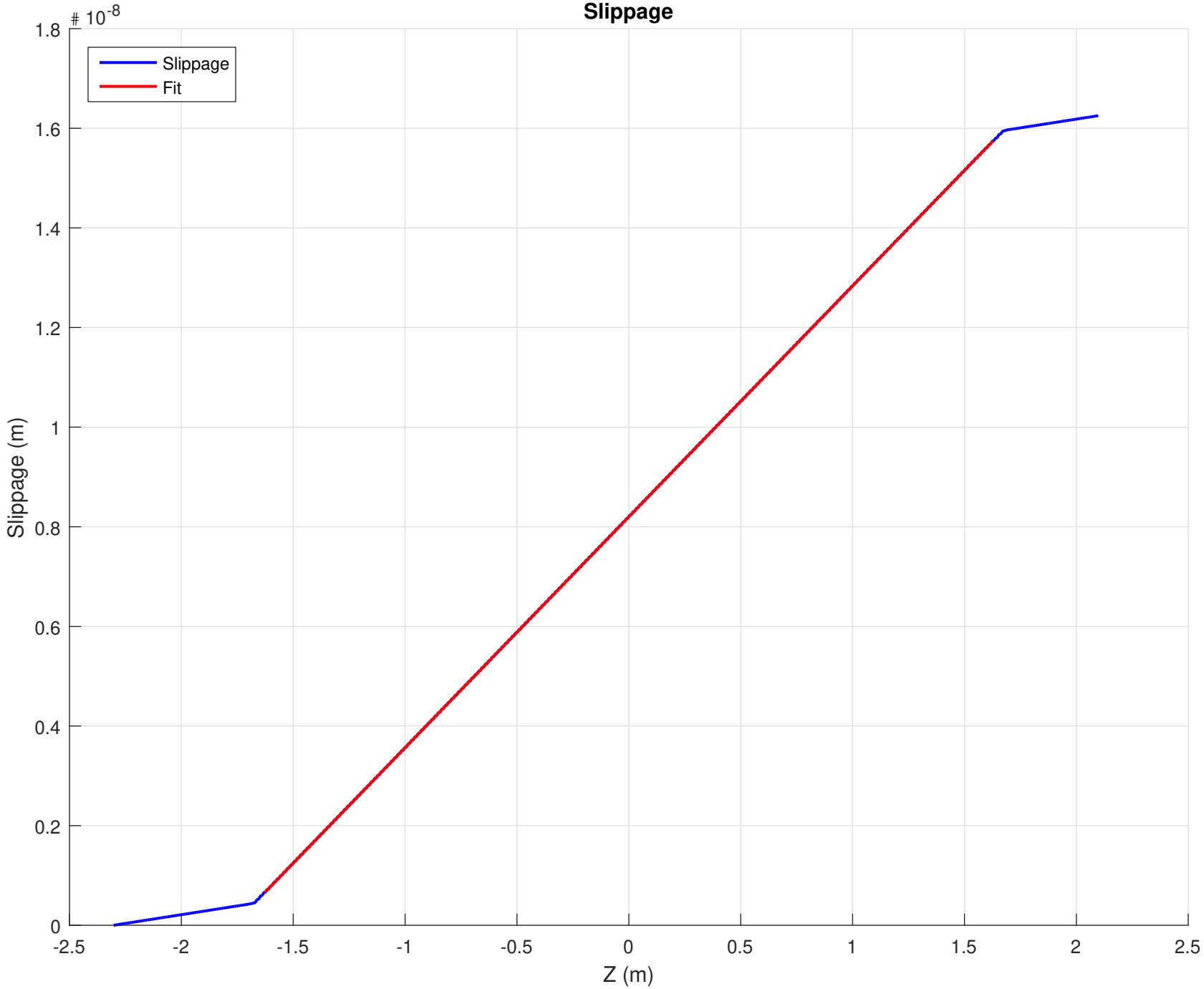

∫∫ Bx dz dz and ∫∫ By dz dz
10^-5
I2x
I2x Filt
I2y
I2y Filt
∫∫B dz dz (Tm**2)
Z (m)
6
4
2
0
-2
-4
-6
-8
-10
-12
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

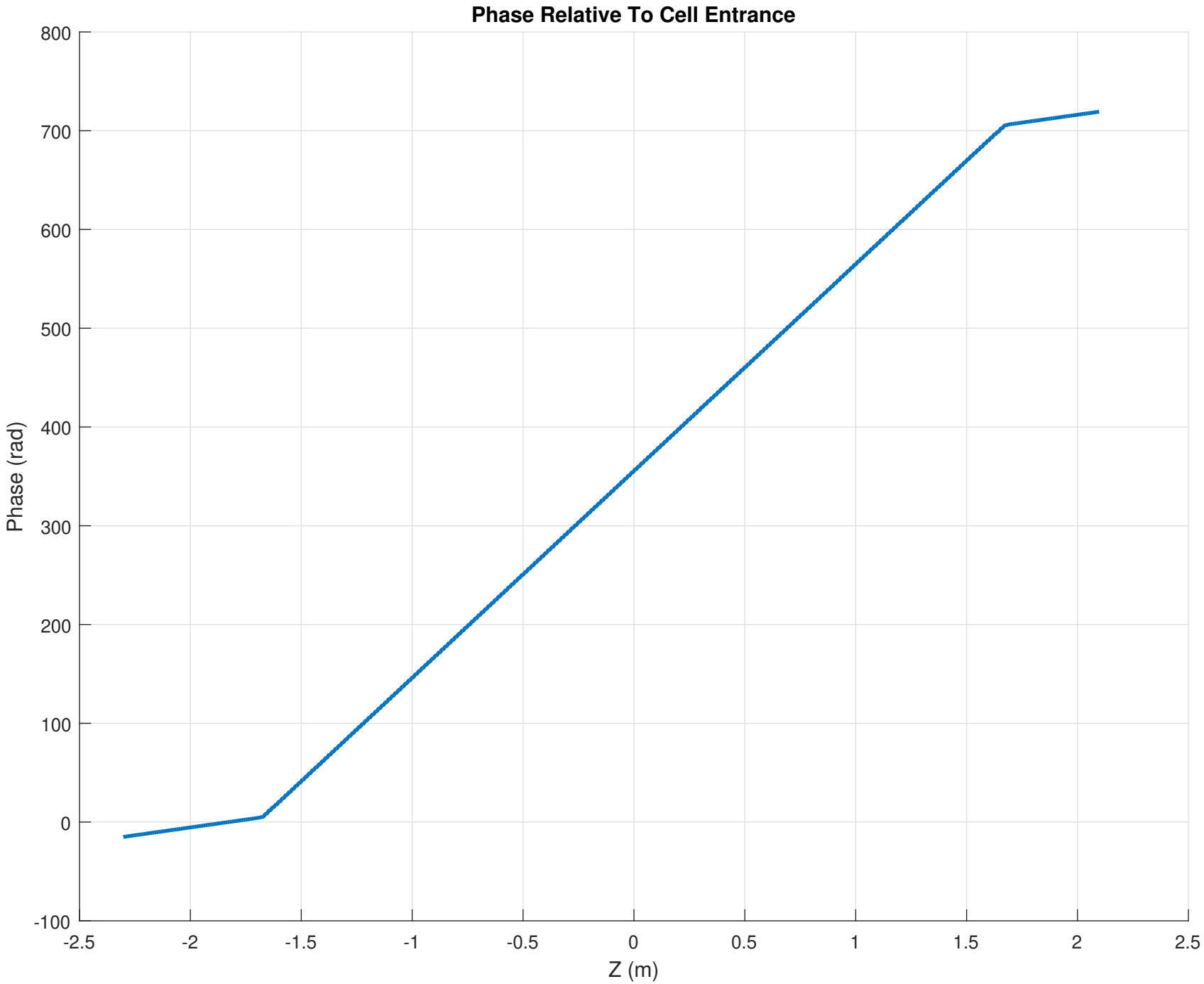

X Trajectory
10^-6
13
46
80
113
146
180
213
Pole
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
X (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

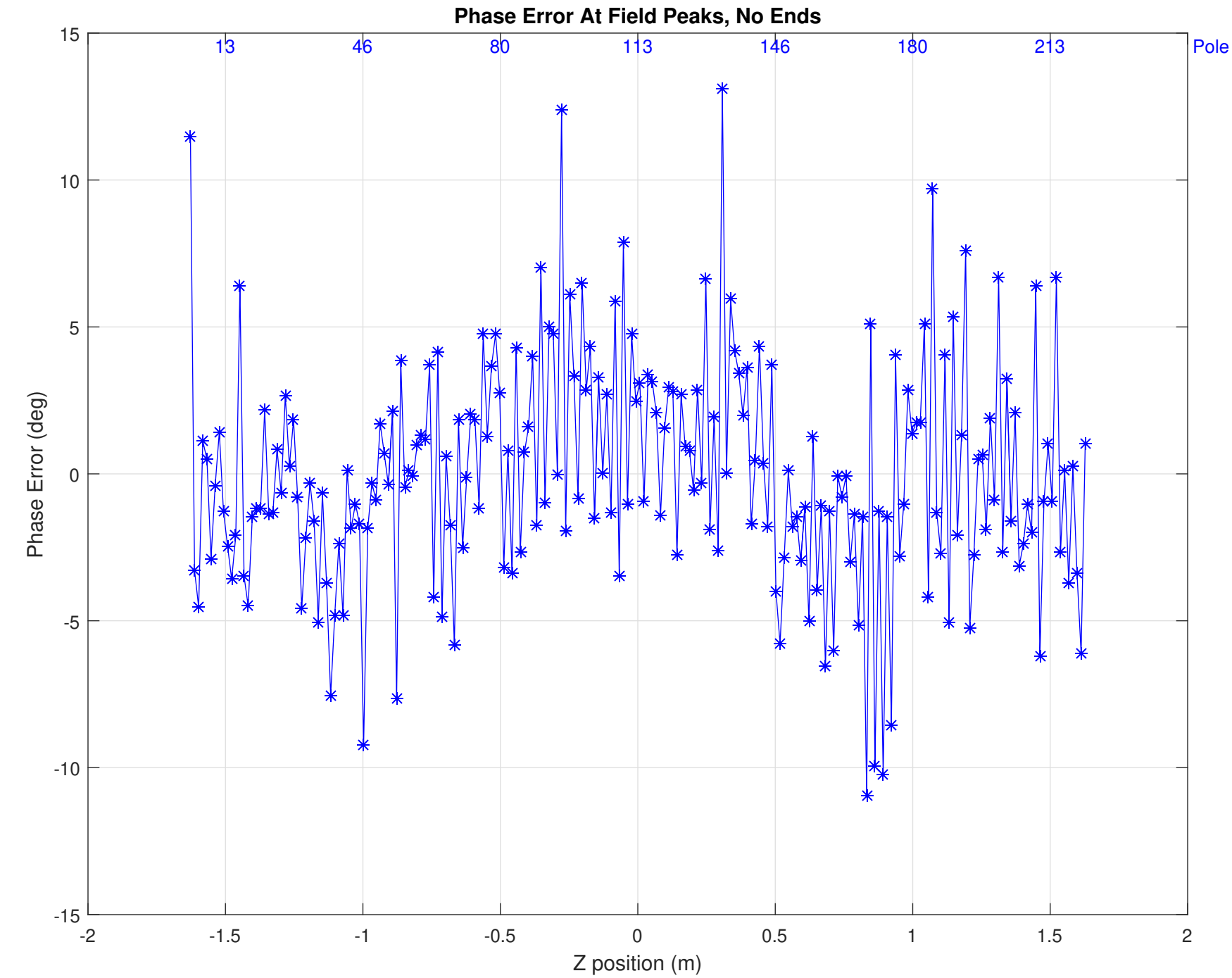

Y Trajectory
10-6
13
46
80
113
146
180
213
Pole
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
Y (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


X Trajectory, Slope Corrected
10^-7
20
15
10
5
0
-5
13
46
80
113
146
180
213
Pole
X Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

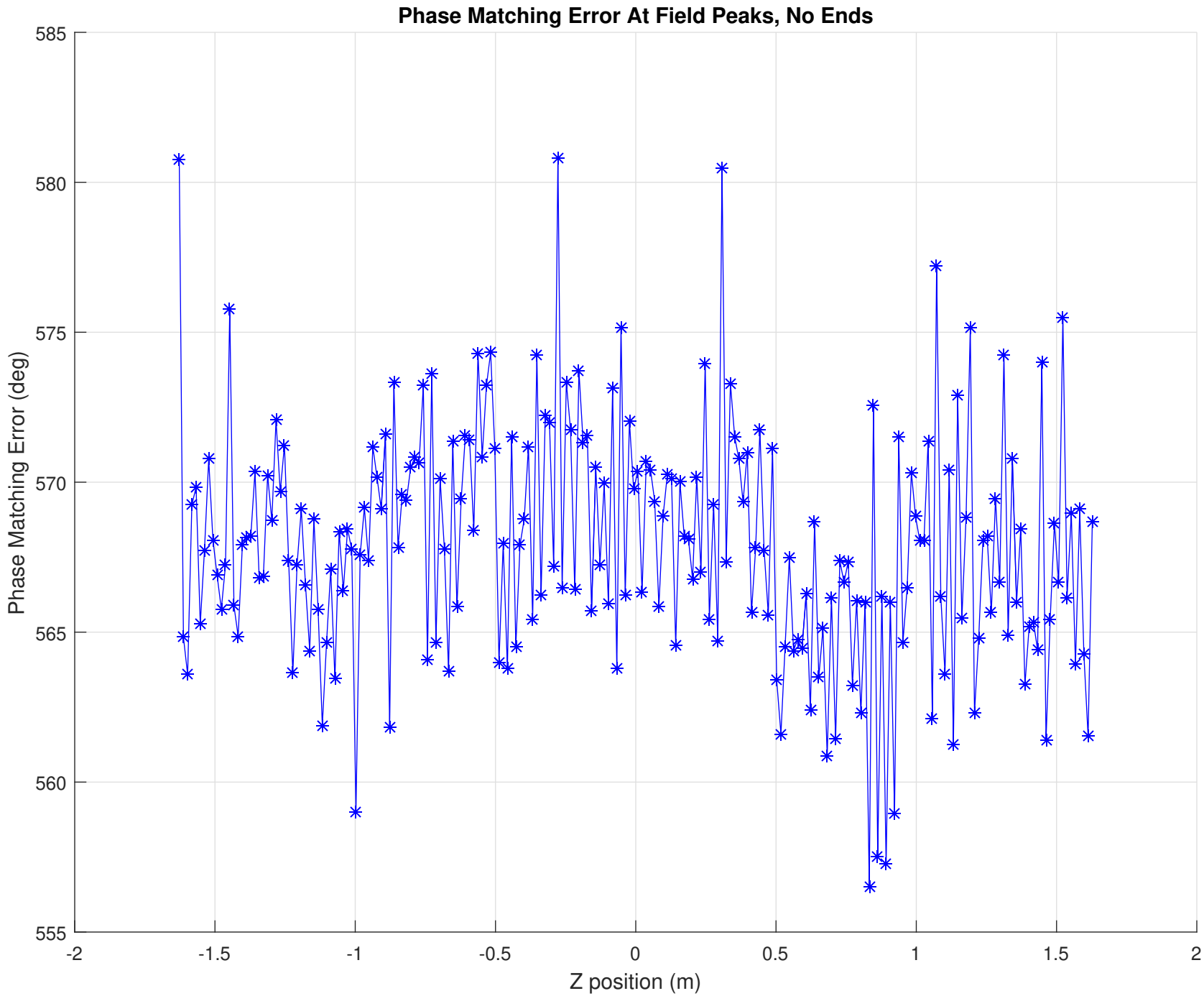

Y Trajectory, Slope Corrected
10-6
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
13
46
80
113
146
180
213
Pole
Y Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


Slippage
10^-8
Slippage
Fit
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Slippage (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z (m)


Phase Relative To Cell Entrance
800
700
600
500
400
300
200
100
0
-100
Phase (rad)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z (m)



Phase Error: Ave = -0.000000 deg, RMS = 3.845721 deg



Phase Match Error: Ave = 567.957797 deg, RMS = 3.938436 deg