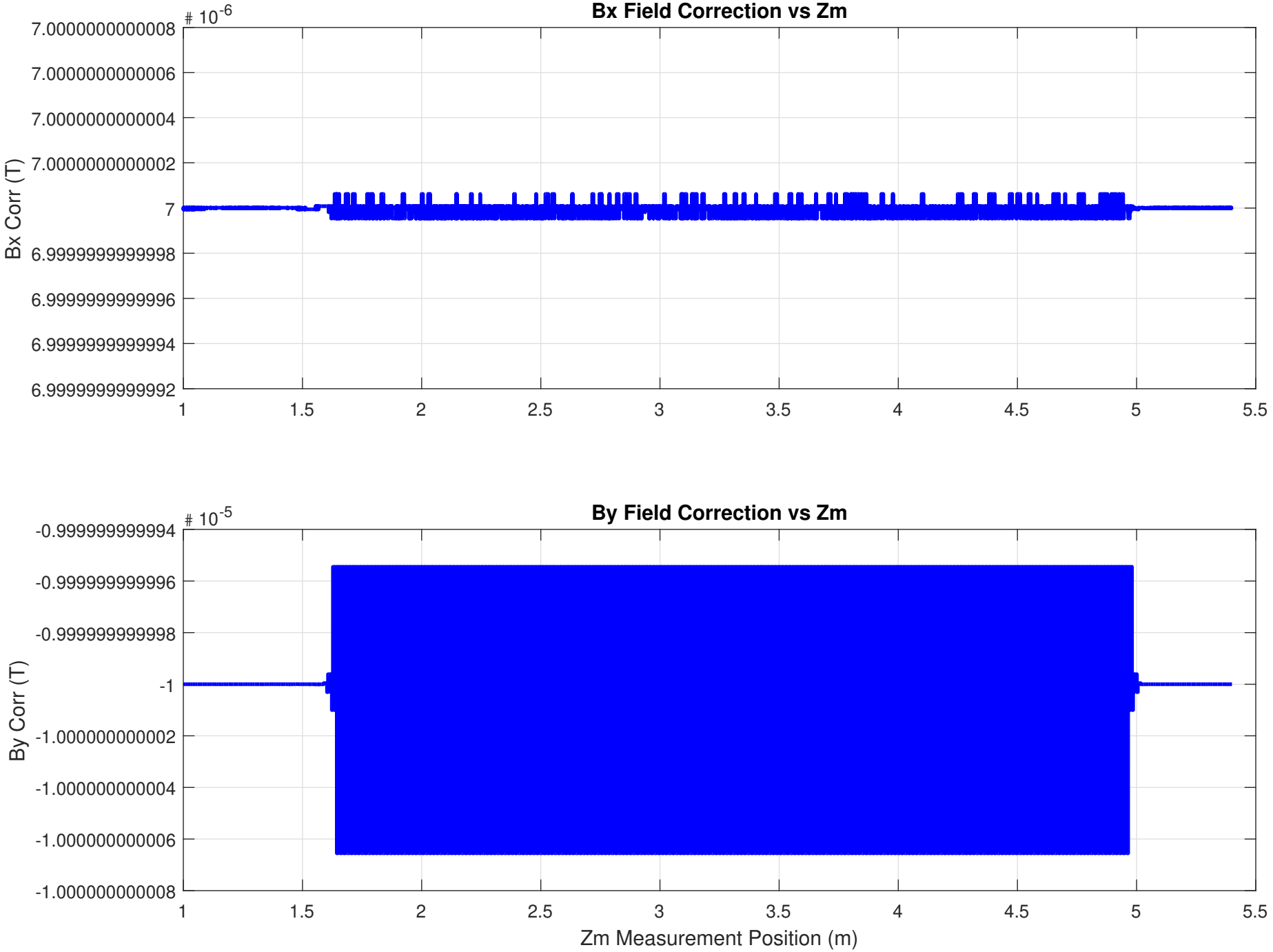
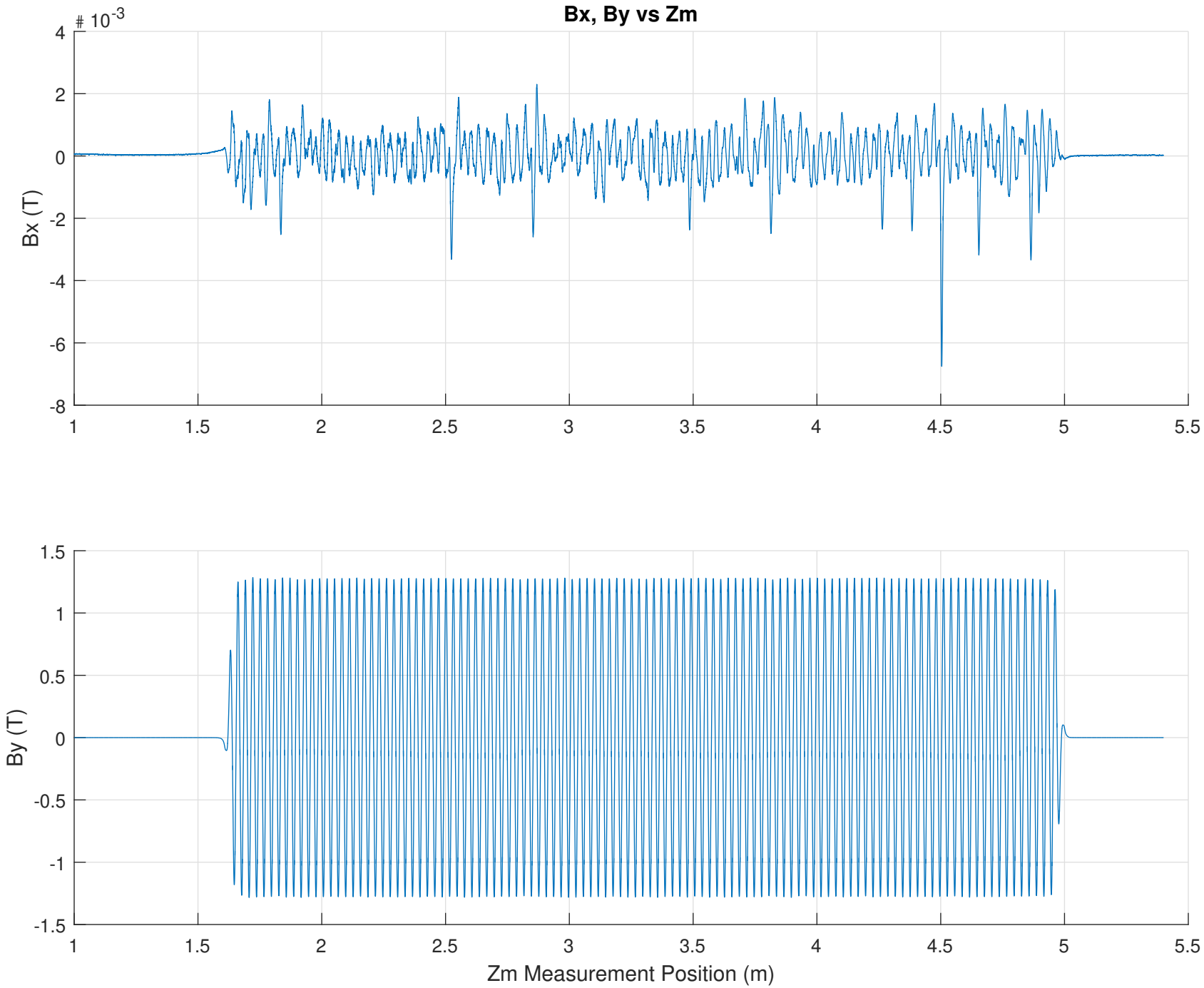
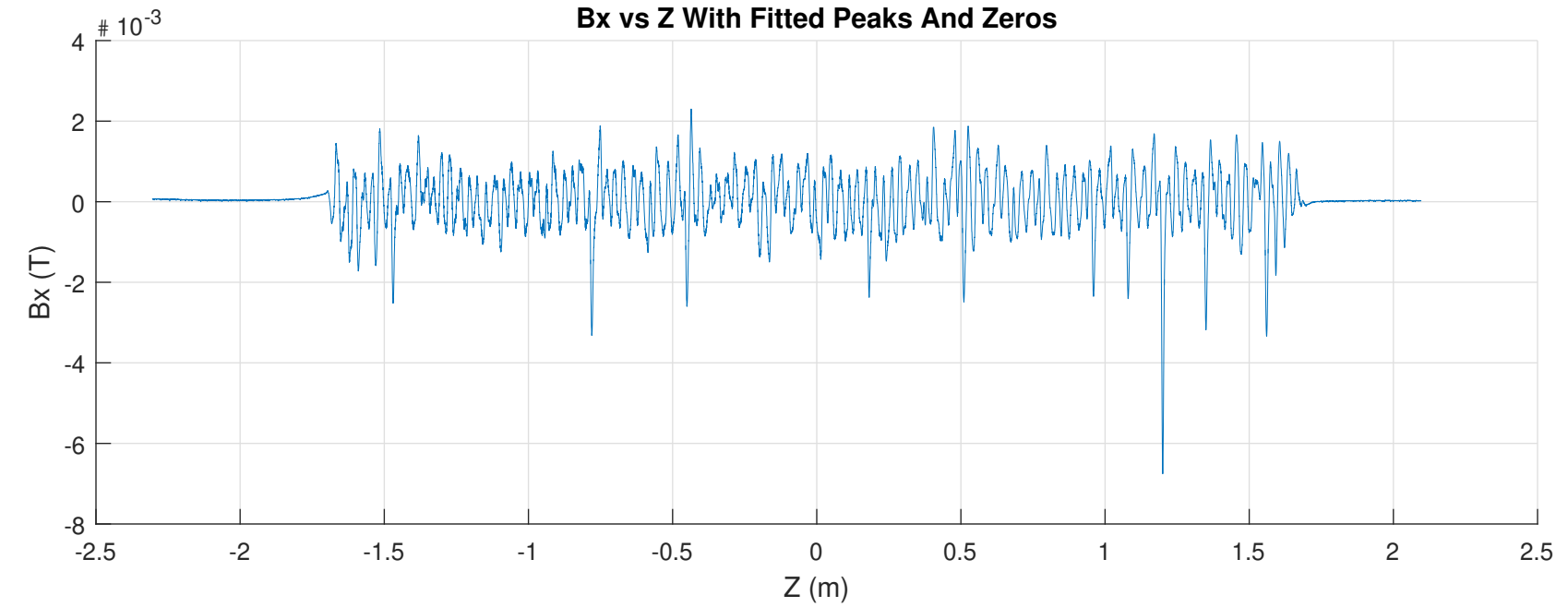
SLAC Magnetic Measurements

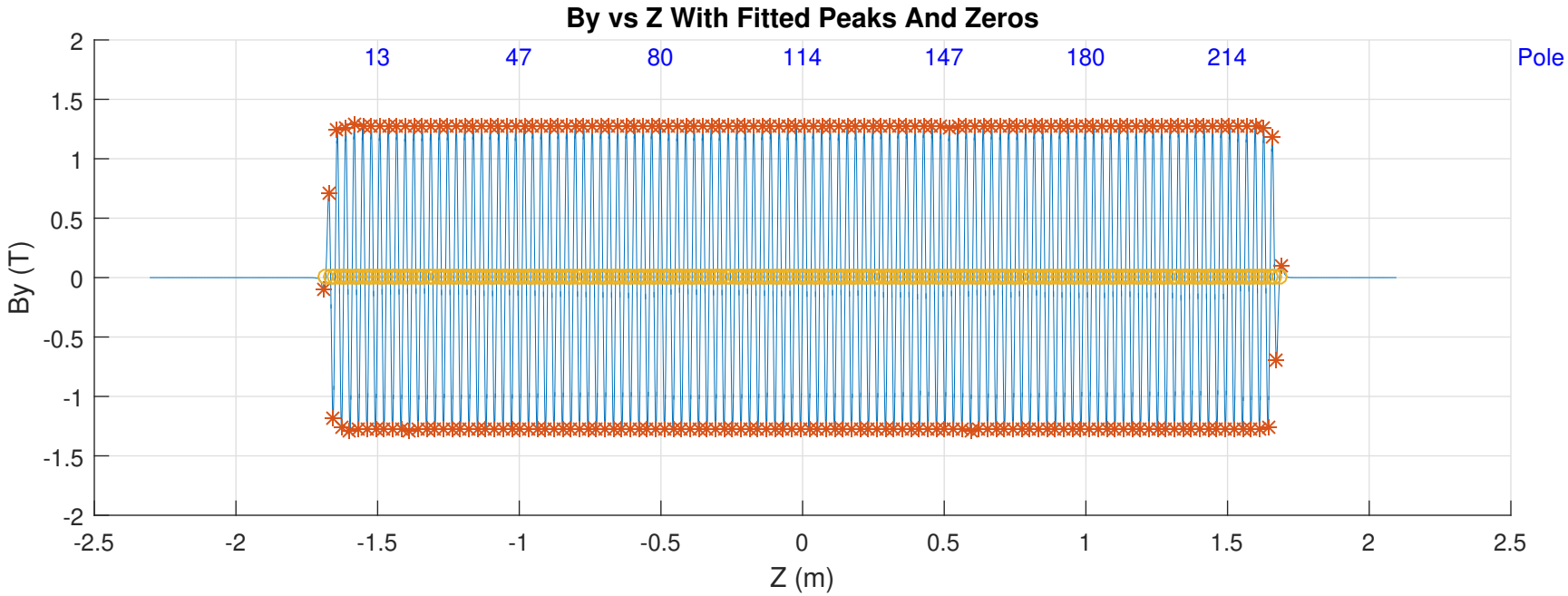
Planar Insertion Device Analysis

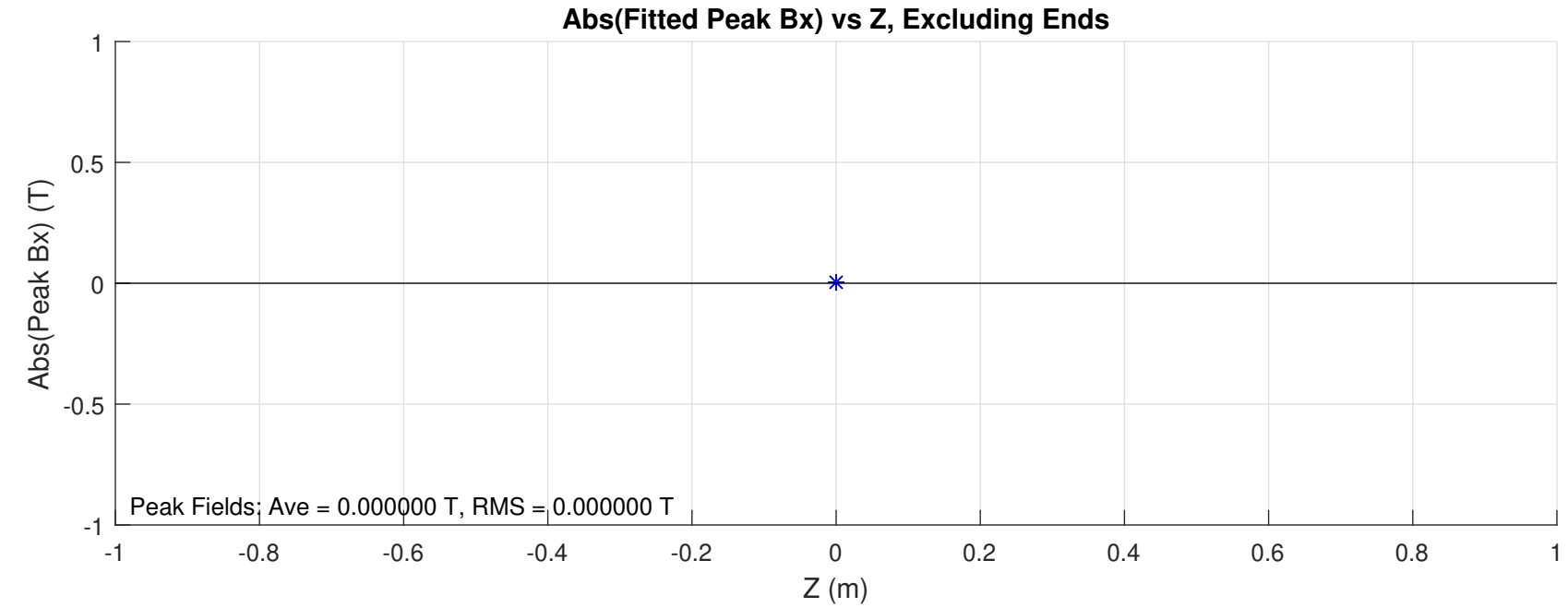
Parameters:
INPUT-FILE-DIR =S:\MagData\LCLS\Undulator\L143-112000-04\DATASET0005\Tuning\Z Scans\Run 018\
INPUT-FILE-NAME =x+00000-y+000-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =1
GAMMA =26689
NOM-LAMBDA-U =0.026
NOM-K-VALUE =3.5
NOM-LAMBDA-R =1.3004e-10
NUM-POLES =226
NUM-END-POLES =6
CELL-LENGTH =3.656

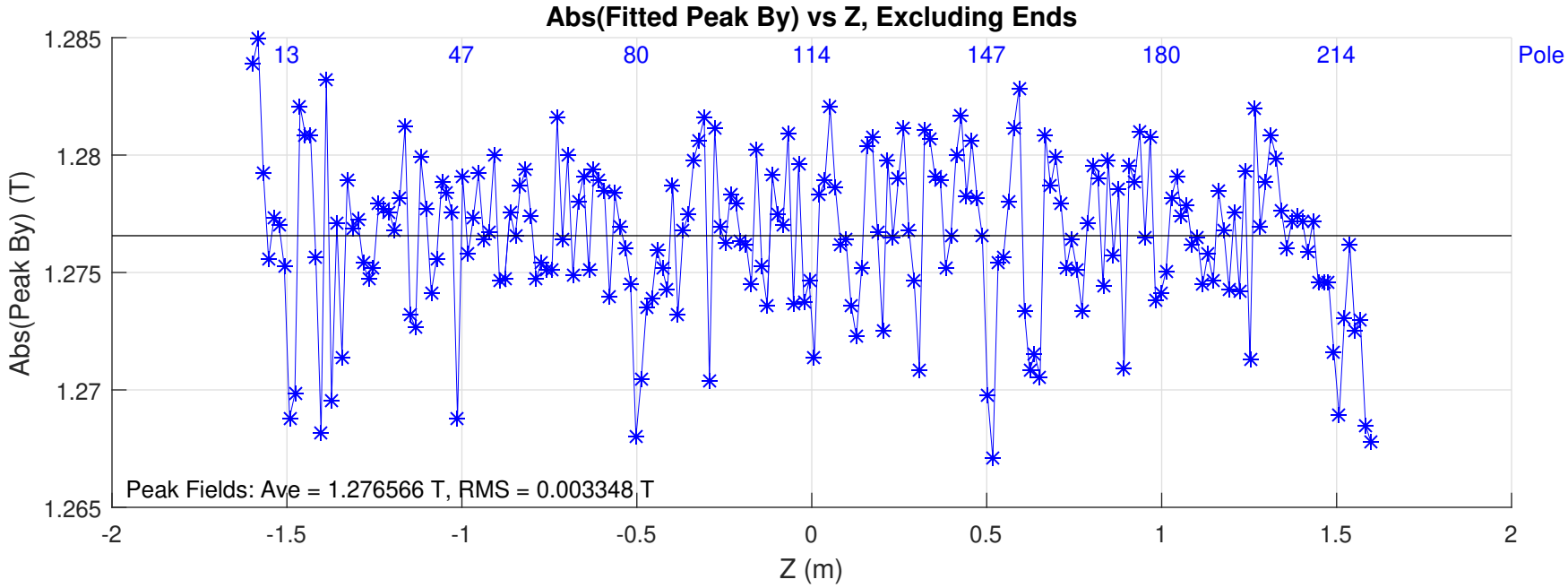

Bx Field Correction vs Zm
10^-6
7.0000000000008
7.0000000000006
7.0000000000004
7.0000000000002
7
6.9999999999998
6.9999999999996
6.9999999999994
6.9999999999992
Bx Corr (T)
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
By Field Correction vs Zm
10^-5
-0.999999999994
-0.999999999996
-0.999999999998
-1
-1.000000000002
-1.000000000004
-1.000000000006
-1.000000000008
By Corr (T)
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
Zm Measurement Position (m)

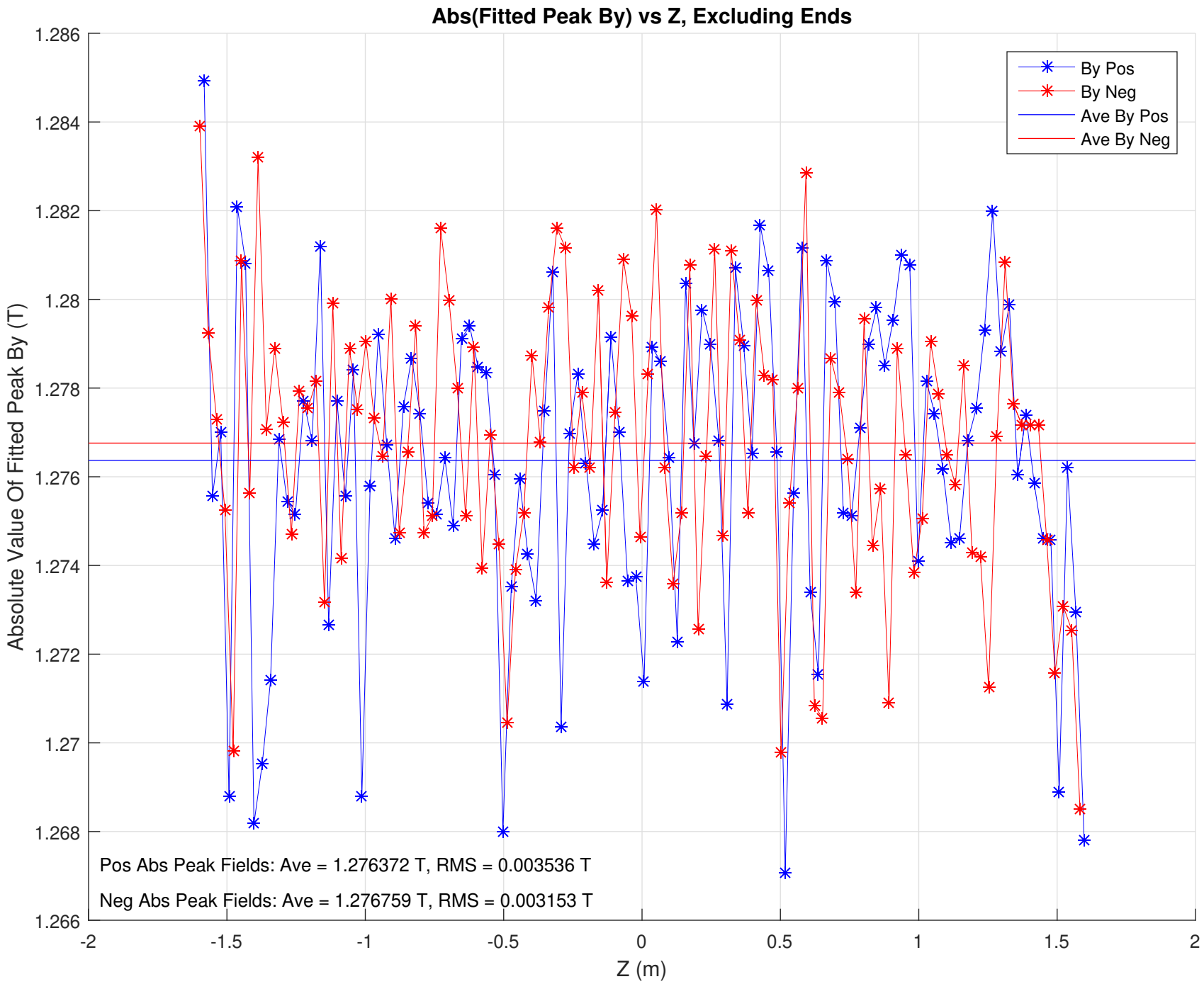

Bx, By vs Zm
10^-3
Bx (T)
By (T)
Zm Measurement Position (m)

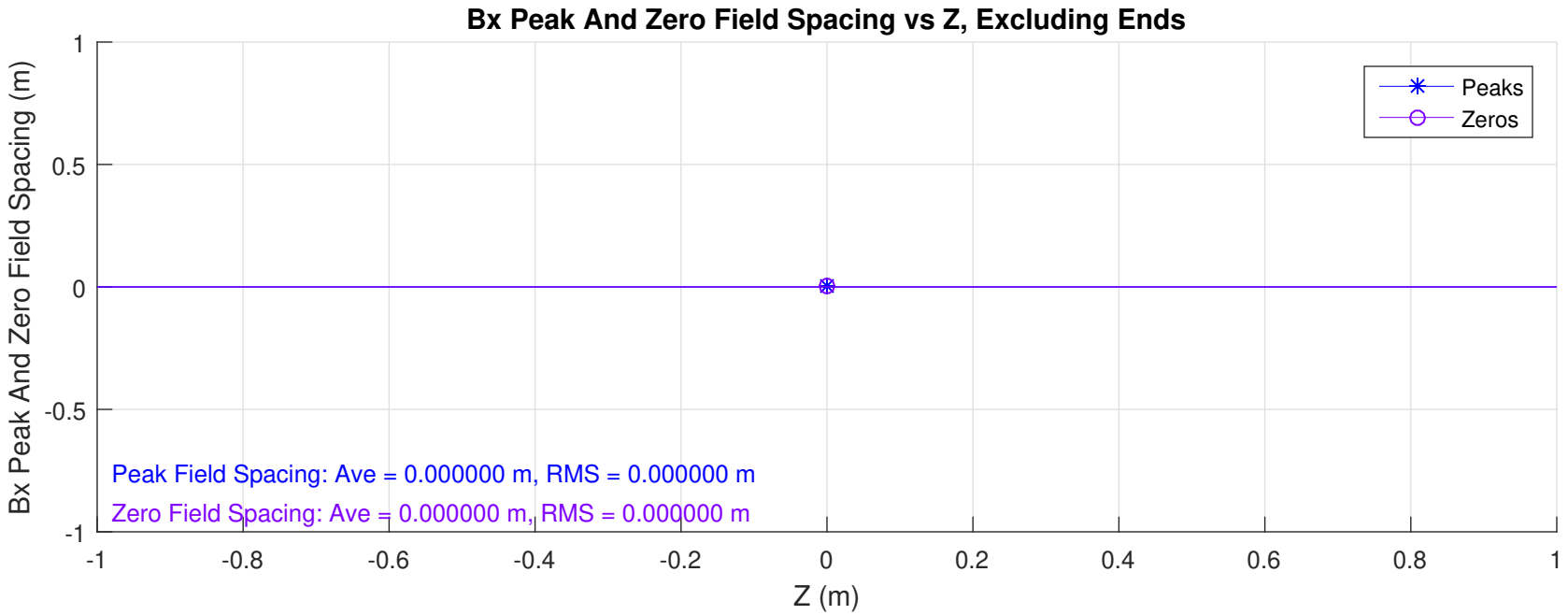

Bx vs Z With Fitted Peaks And Zeros
10^-3
Bx (T)
Z (m)

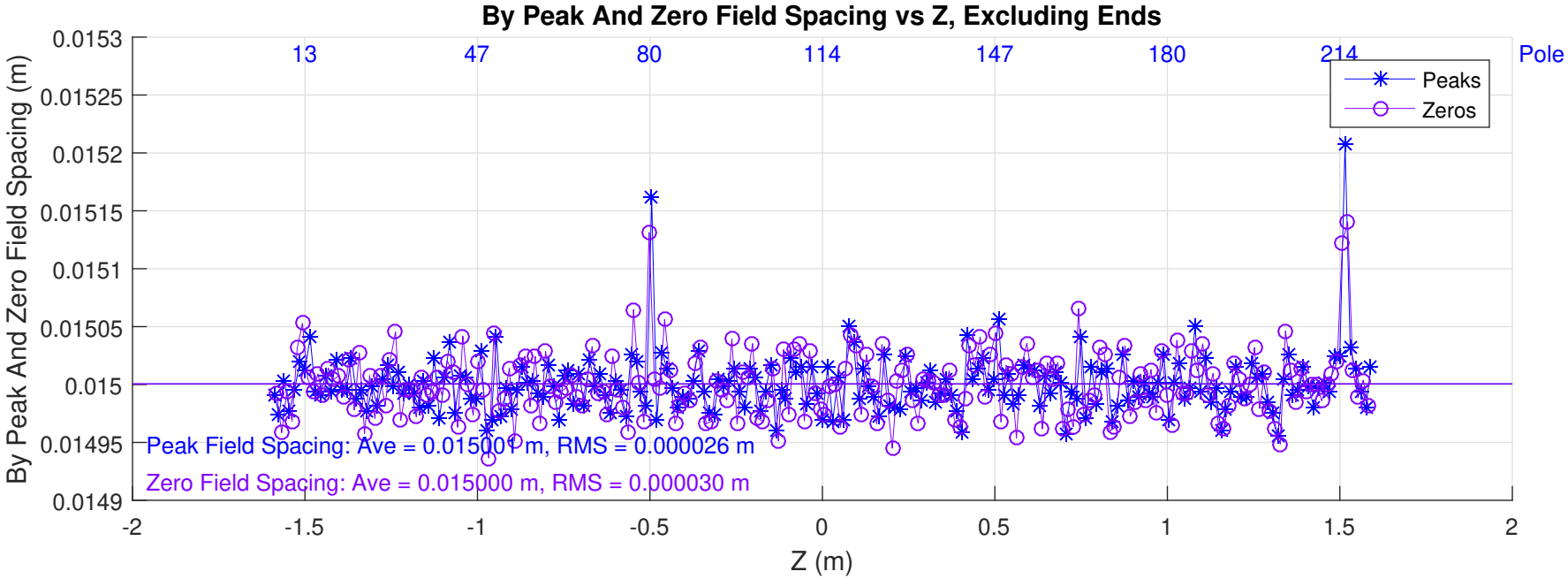

By vs Z With Fitted Peaks And Zeros
13
47
80
114
147
180
214
Pole
By (T)
Z (m)

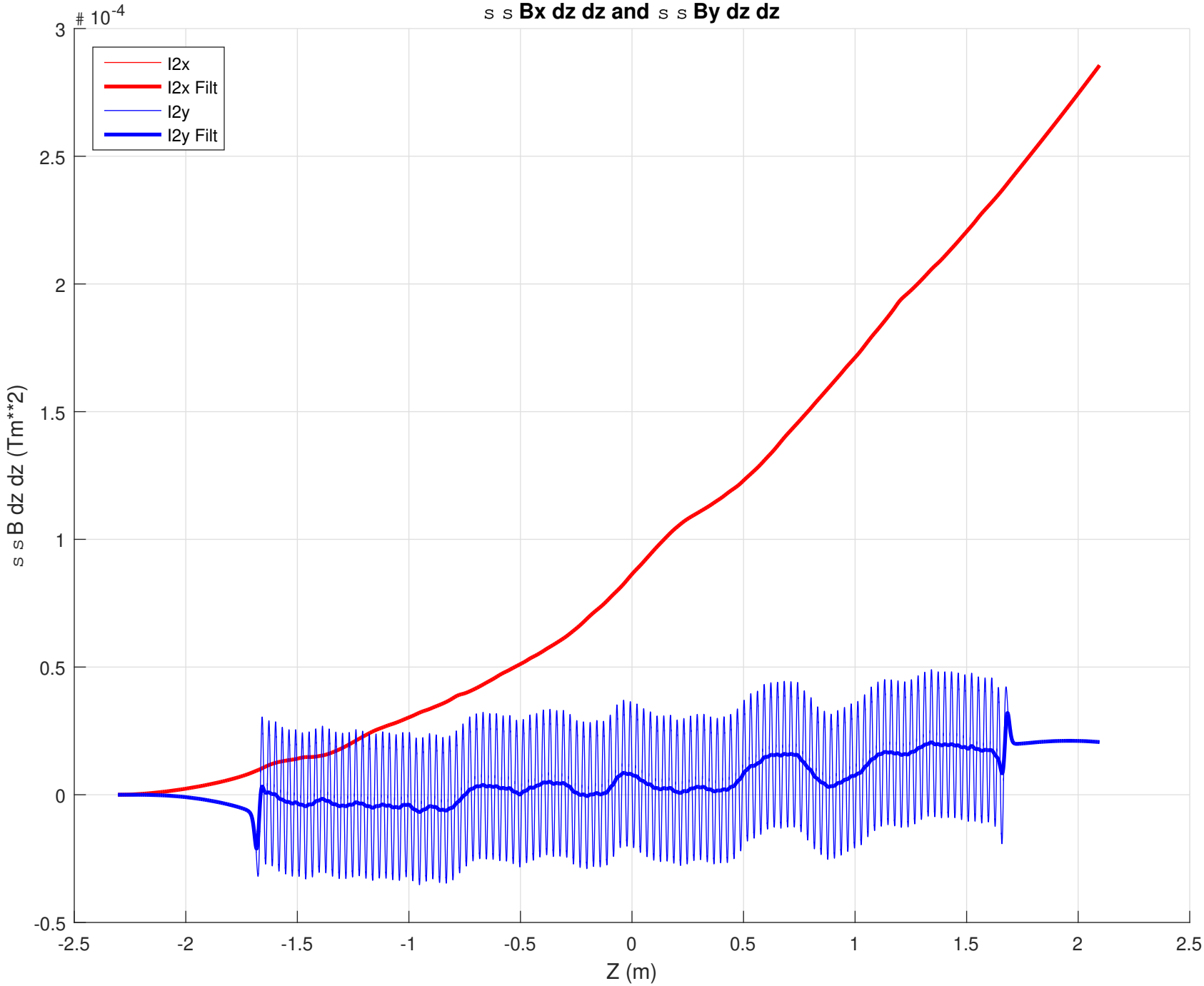

Abs(Fitted Peak Bx) vs Z, Excluding Ends
Abs(Peak Bx) (T)
Z (m)
Peak Fields: Ave = 0.000000 T, RMS = 0.000000 T

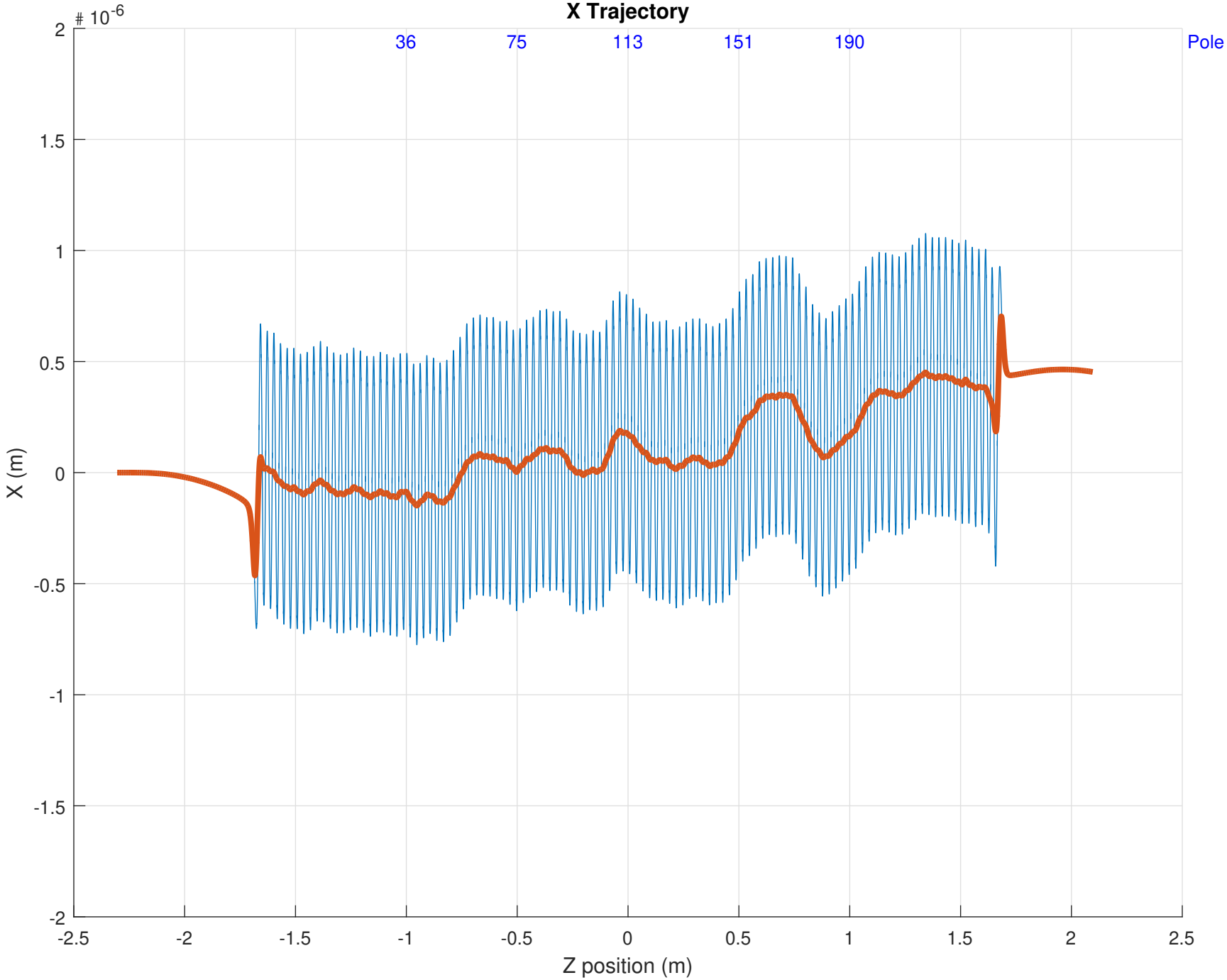

Abs(Fitted Peak By) vs Z, Excluding Ends
13
47
80
114
147
180
214
Pole
Abs(Peak By) (T)
Z (m)
Peak Fields: Ave = 1.276566 T, RMS = 0.003348 T

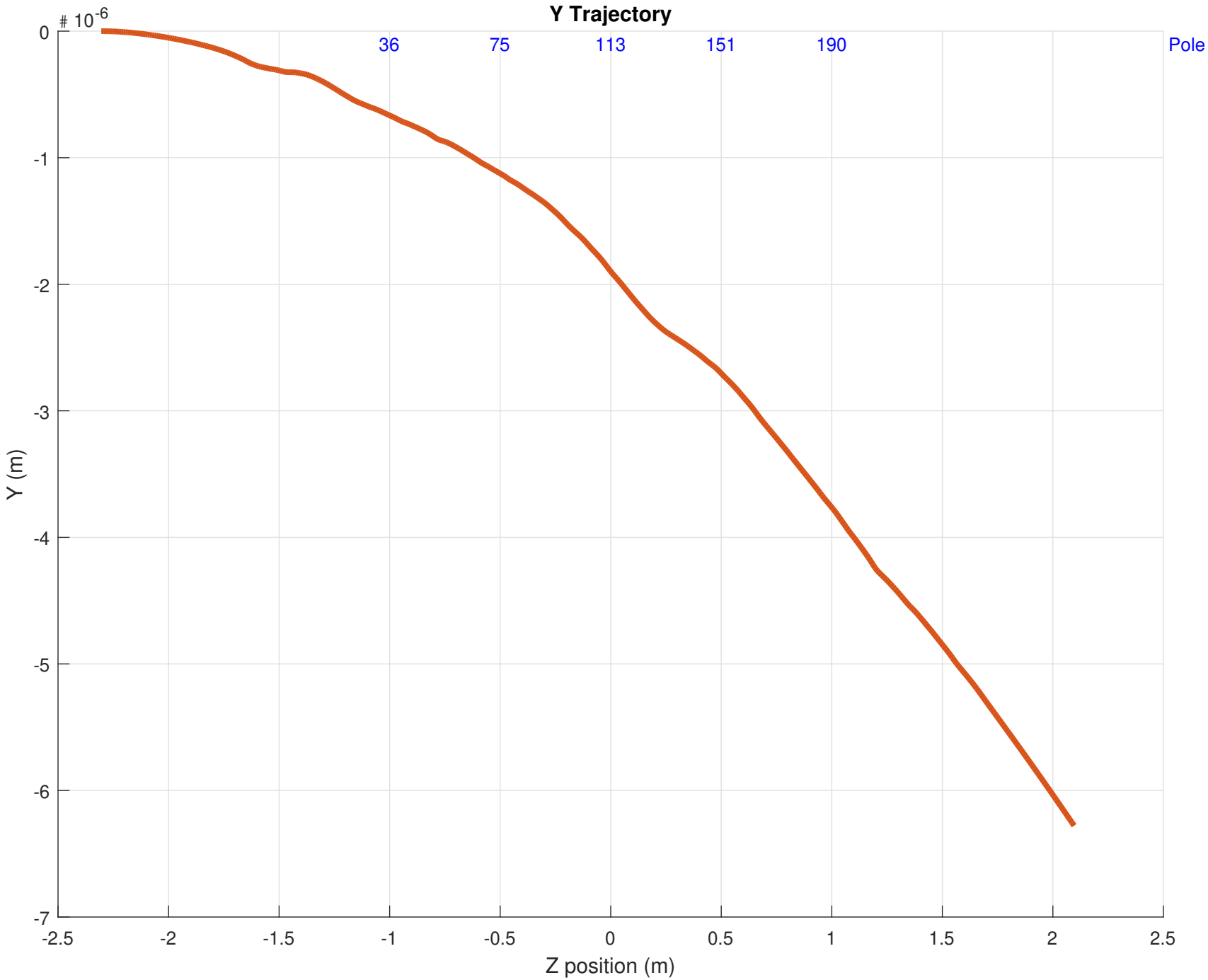

Abs(Fitted Peak By) vs Z, Excluding Ends
By Pos
By Neg
Ave By Pos
Ave By Neg
Absolute Value Of Fitted Peak By (T)
Z (m)
1.286
1.284
1.282
1.28
1.278
1.276
1.274
1.272
1.27
1.268
1.266
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Pos Abs Peak Fields: Ave = 1.276372 T, RMS = 0.003536 T
Neg Abs Peak Fields: Ave = 1.276759 T, RMS = 0.003153 T

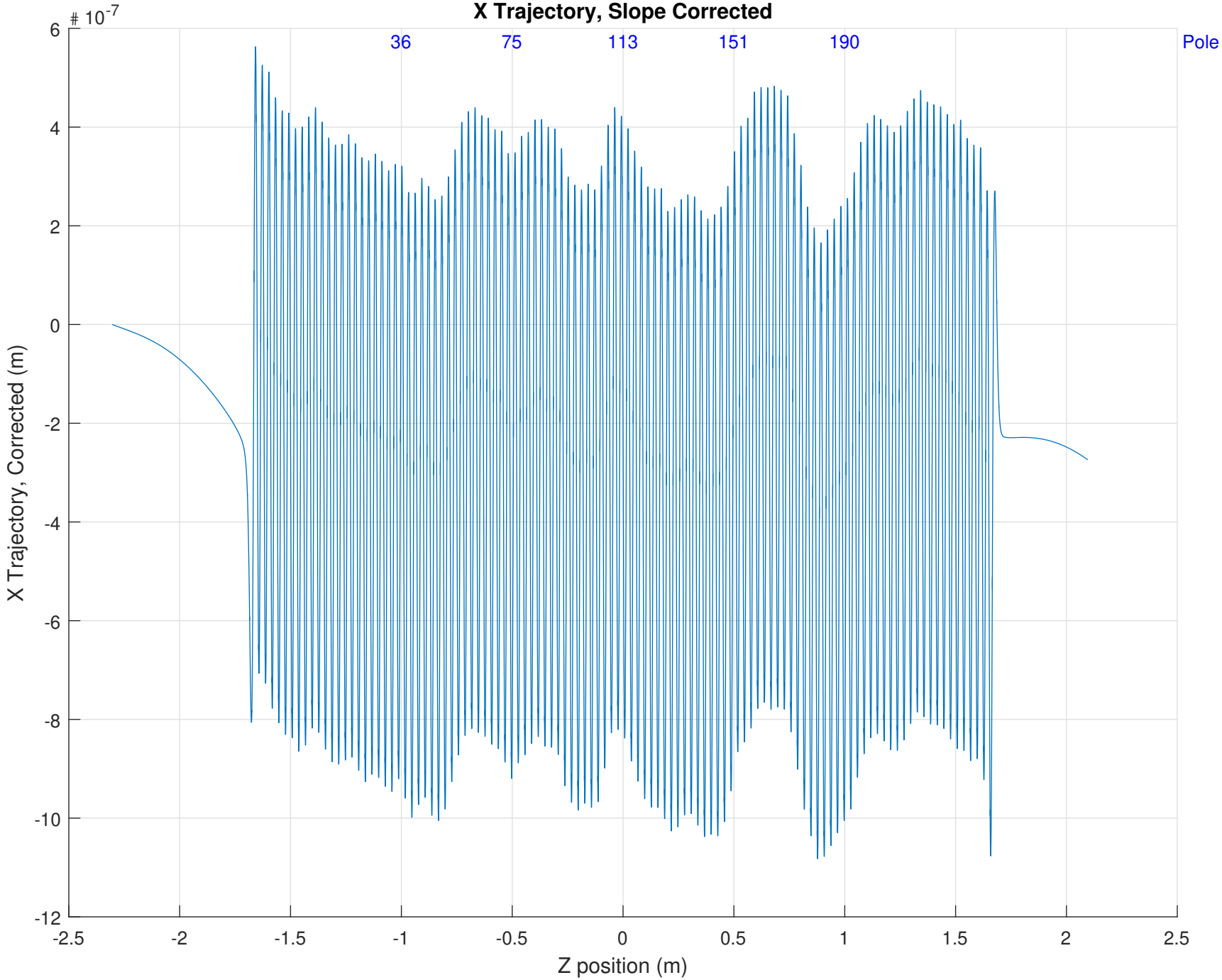

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Peaks
Zeros
Peak Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
Zero Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m

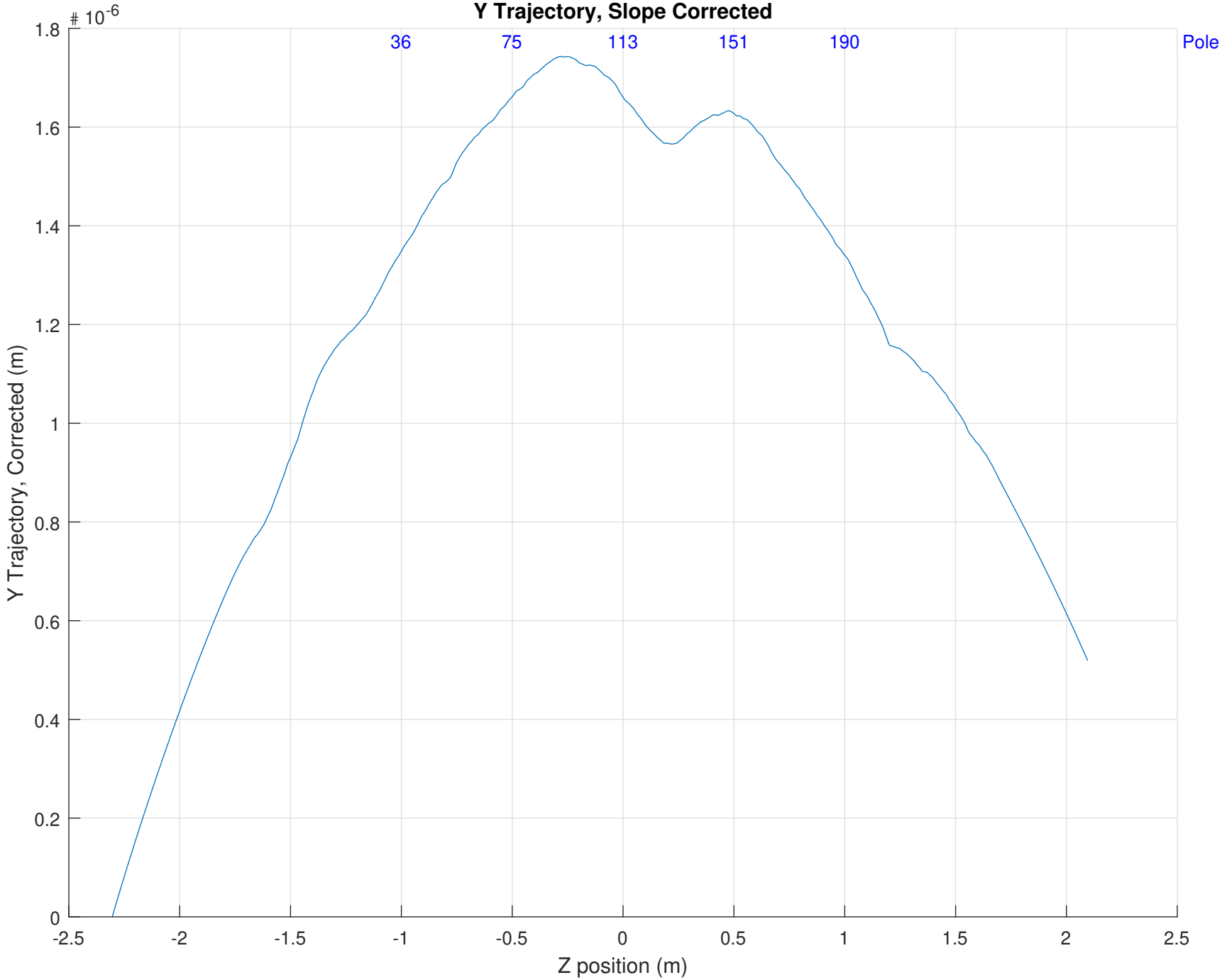

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
13
47
80
114
147
180
214
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.015001 m, RMS = 0.000026 m
Zero Field Spacing: Ave = 0.015000 m, RMS = 0.000030 m

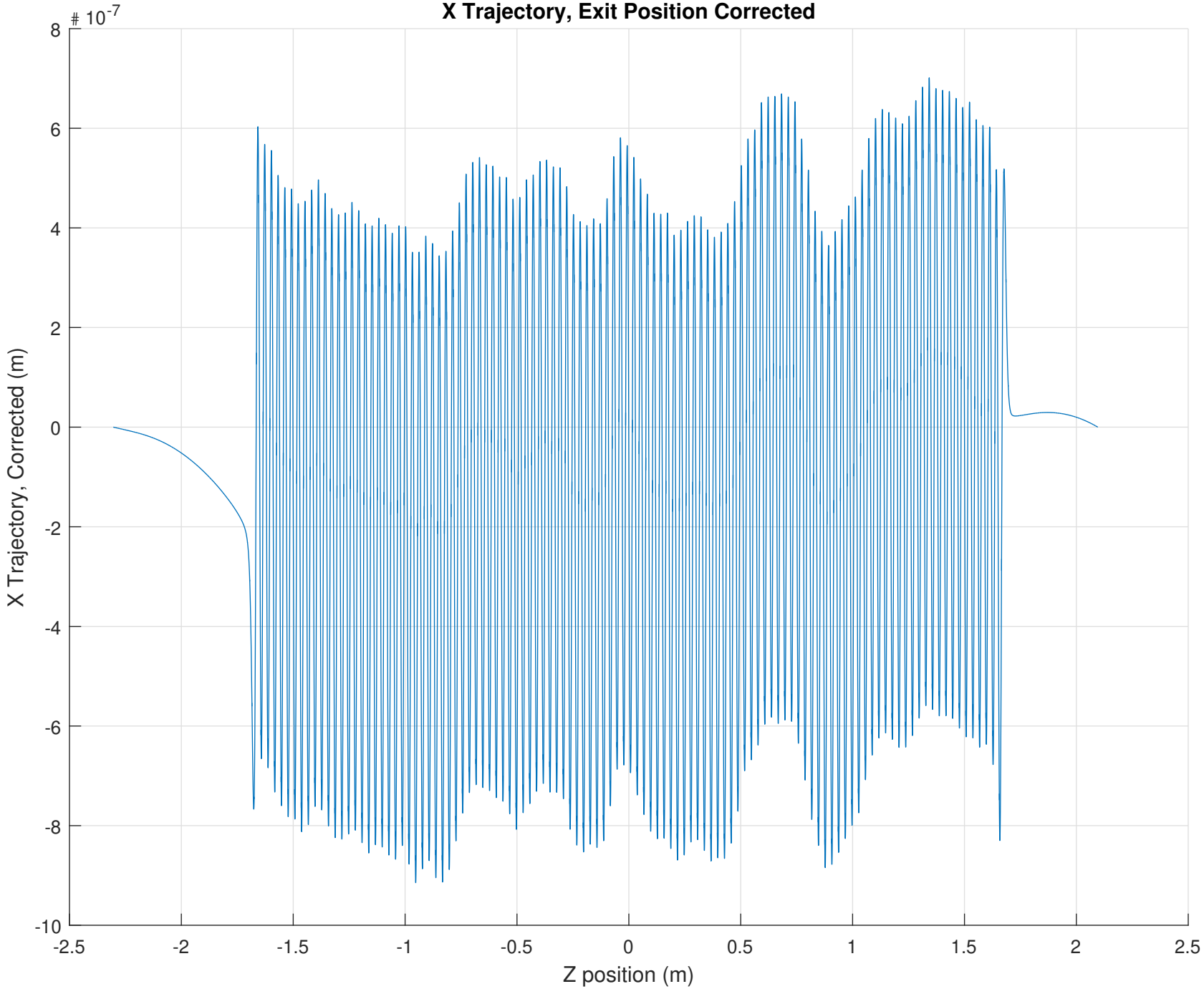

s s Bx dz dz and s s By dz dz
10^-4
I2x
I2x Filt
I2y
I2y Filt
s s B dz dz (Tm**2)
Z (m)
3
2.5
2
1.5
1
0.5
0
-0.5
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

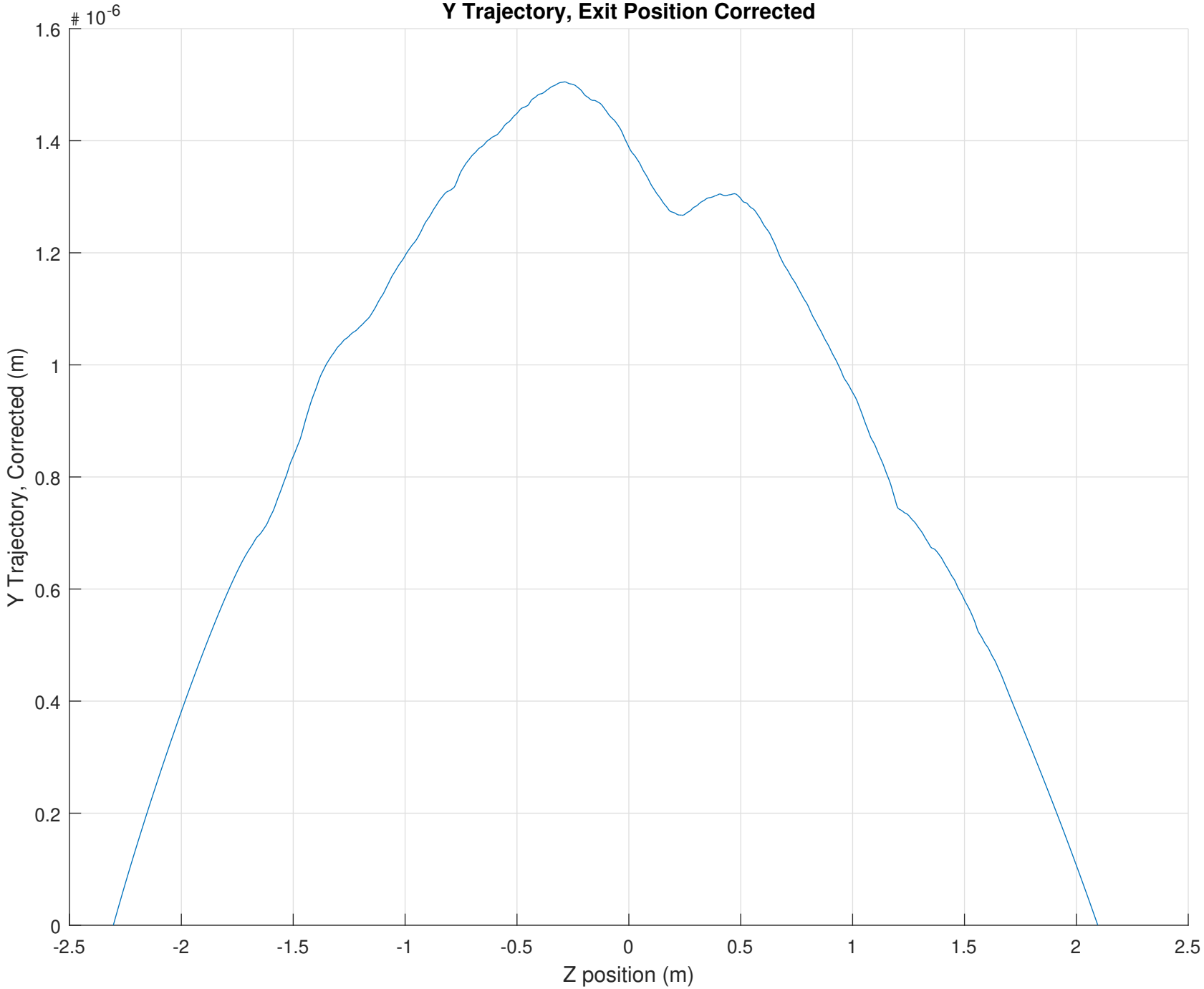

X Trajectory
10^-6
36
75
113
151
190
Pole
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
X (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

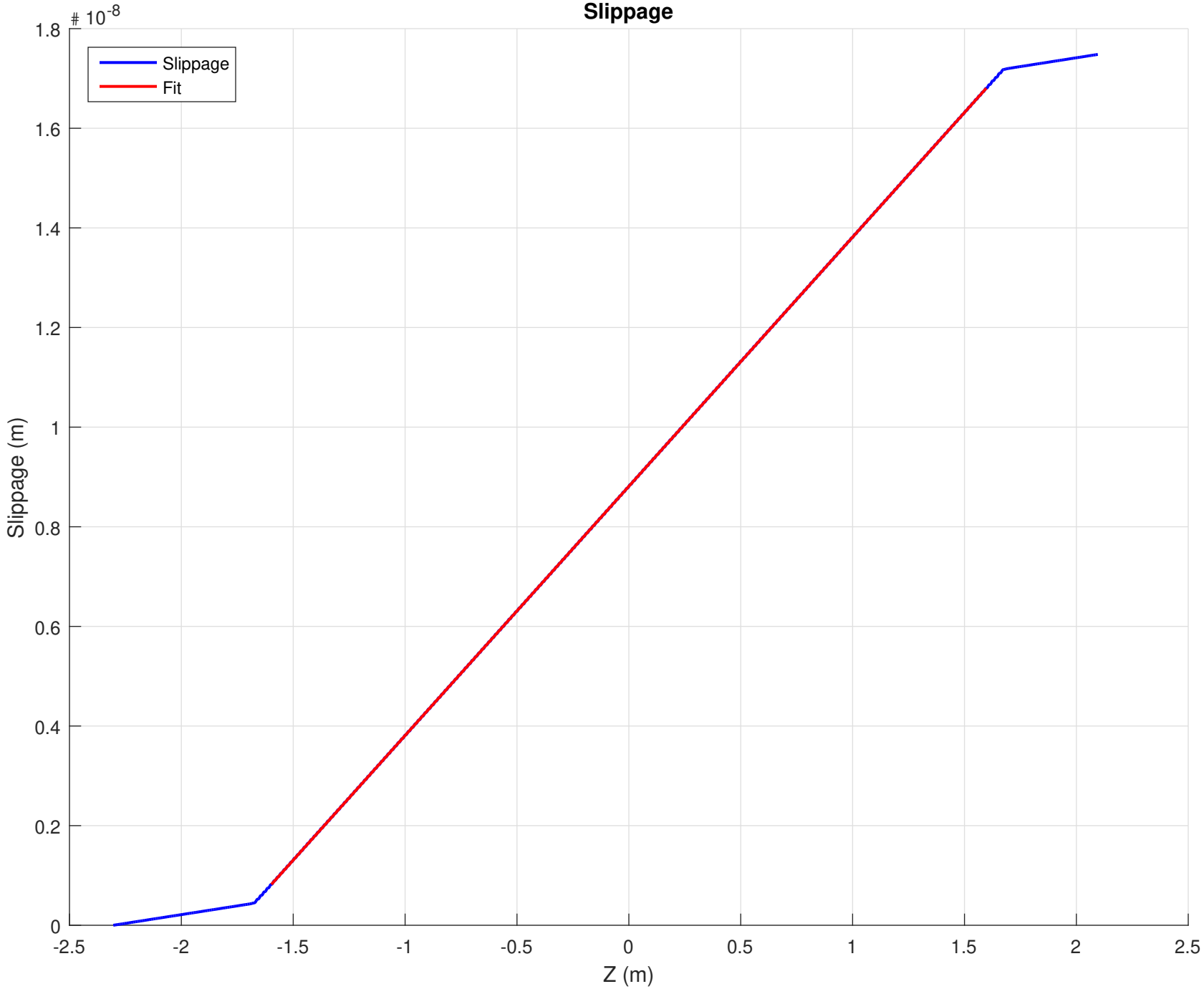

Y Trajectory
10-6
0
-1
-2
-3
-4
-5
-6
-7
Y (m)
36
75
113
151
190
Pole
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

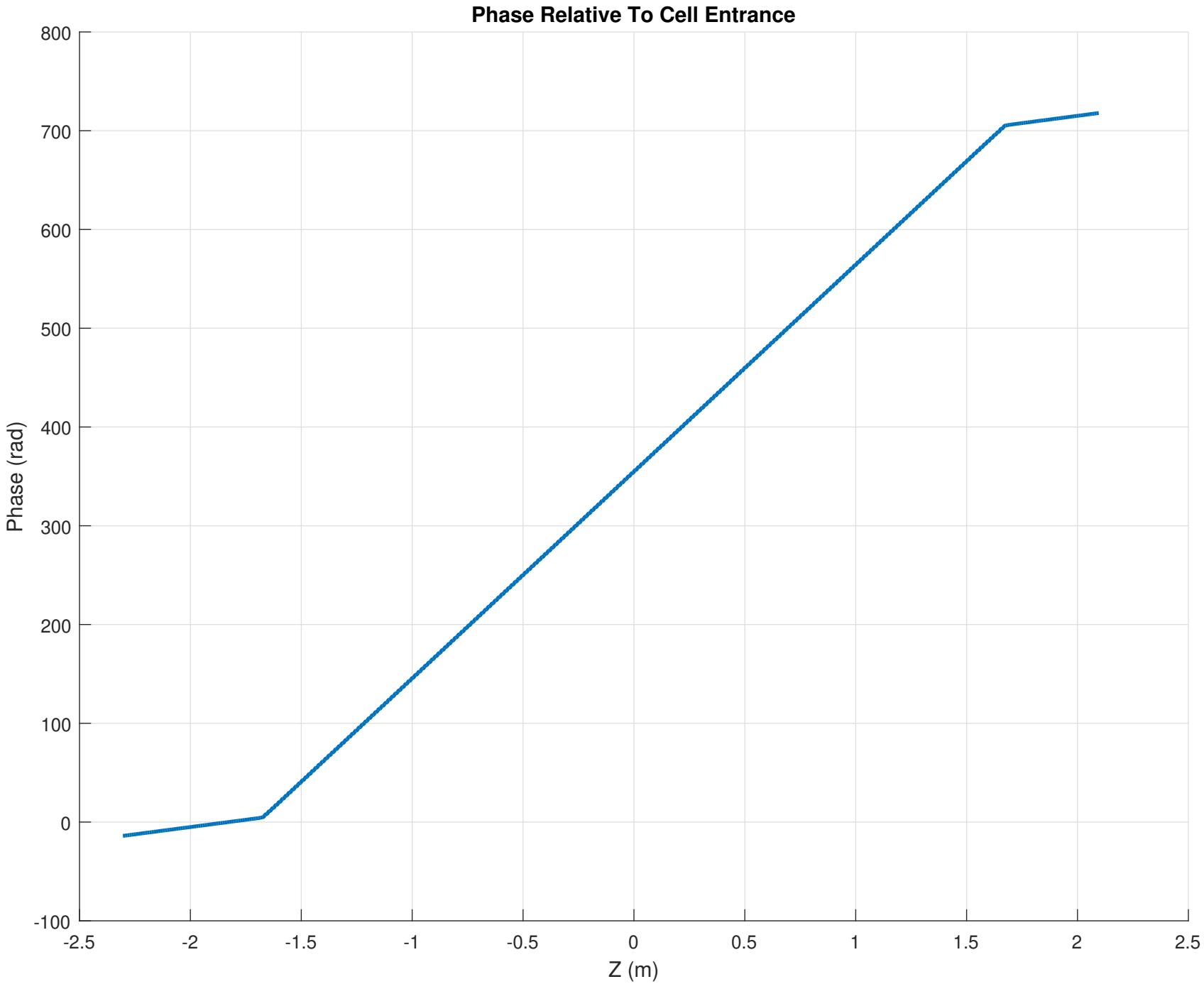

X Trajectory, Slope Corrected
10^-7
6
4
2
0
-2
-4
-6
-8
-10
-12
X Trajectory, Corrected (m)
36
75
113
151
190
Pole
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

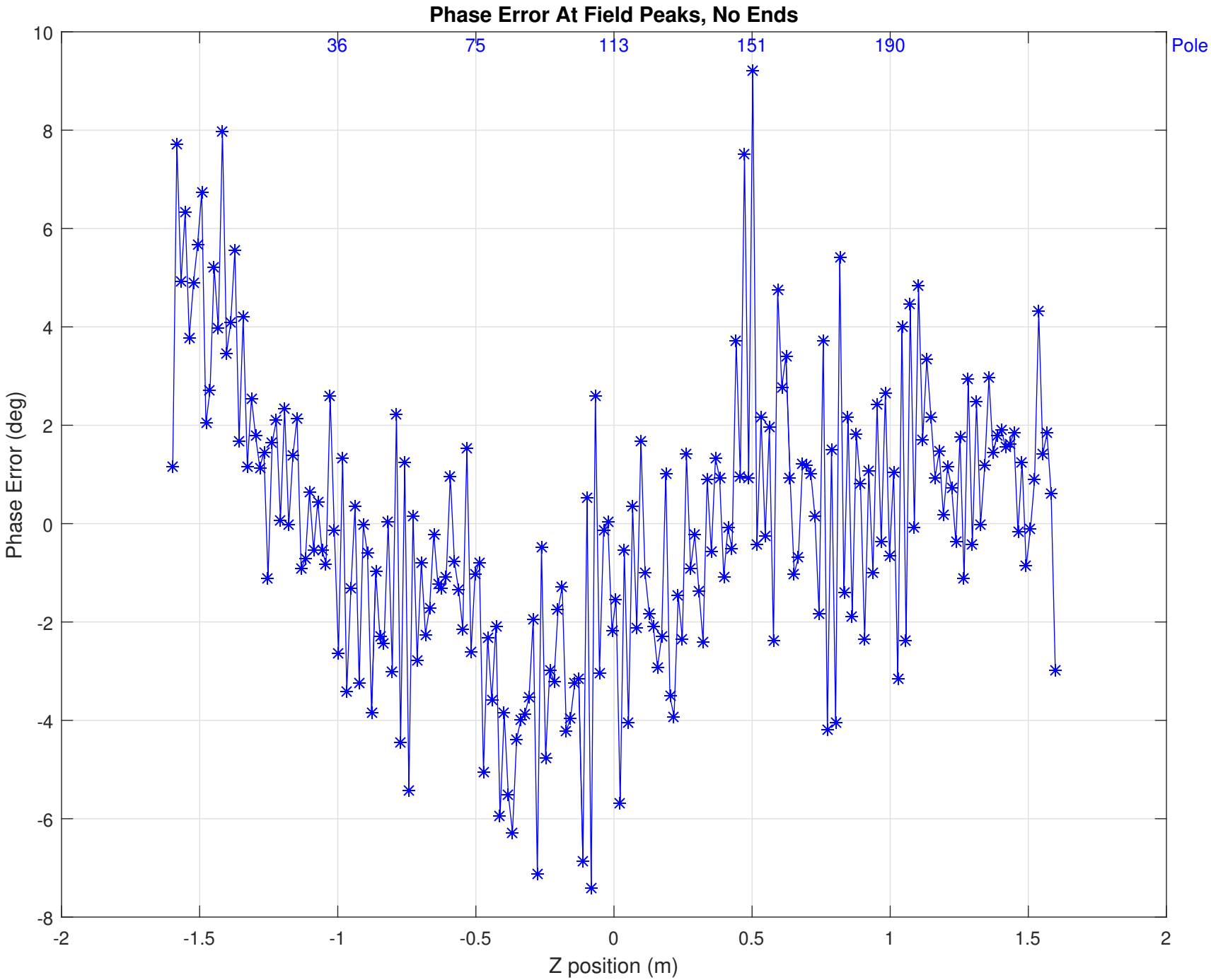

Y Trajectory, Slope Corrected
10-6
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Y Trajectory, Corrected (m)
36
75
113
151
190
Pole
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


X Trajectory, Exit Position Corrected
10^-7
8
6
4
2
0
-2
-4
-6
-8
-10
X Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

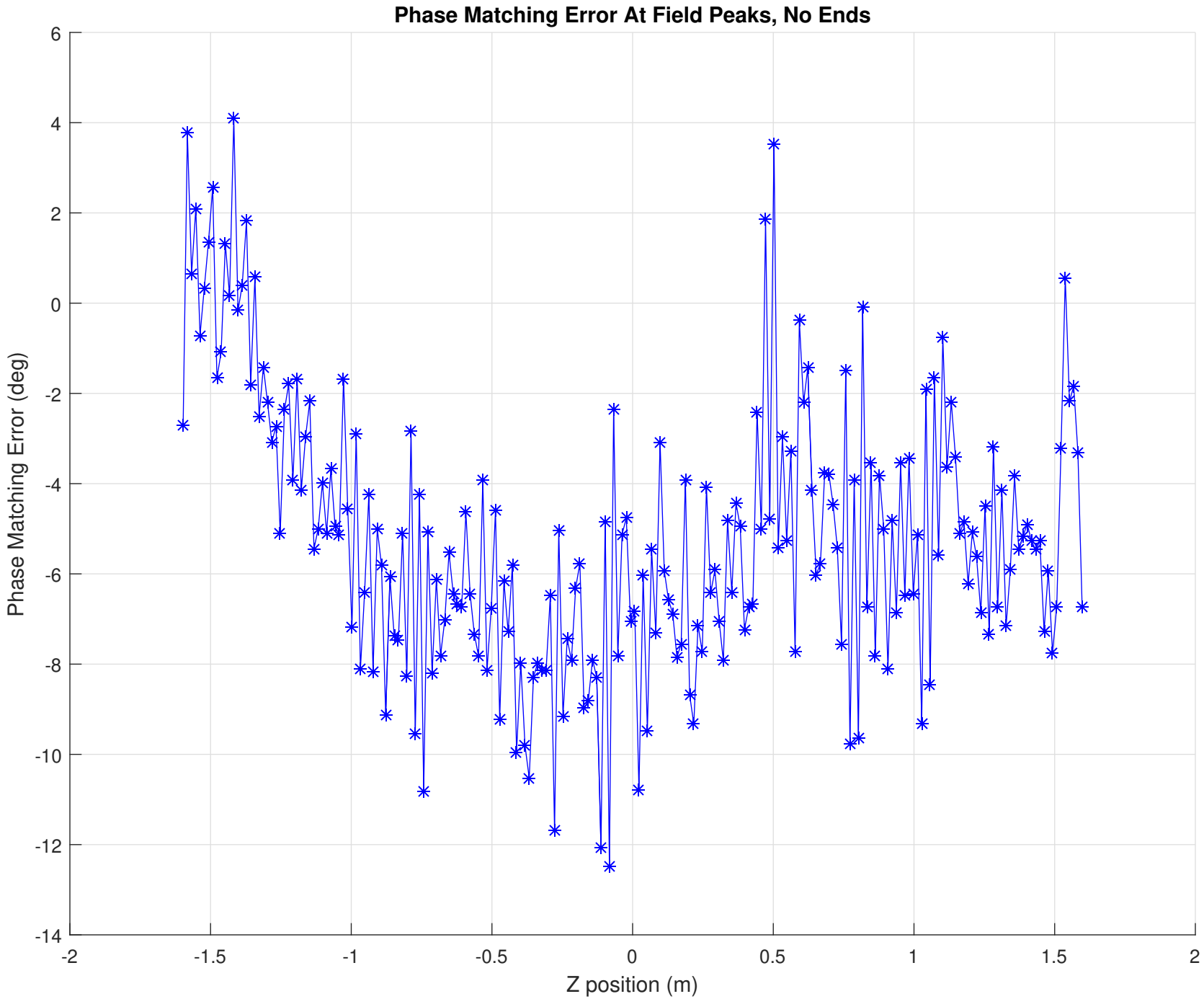

Y Trajectory, Exit Position Corrected
10^-6
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Y Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


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 = 2.915843 deg



Phase Match Error: Ave = -5.129136 deg, RMS = 3.044474 deg