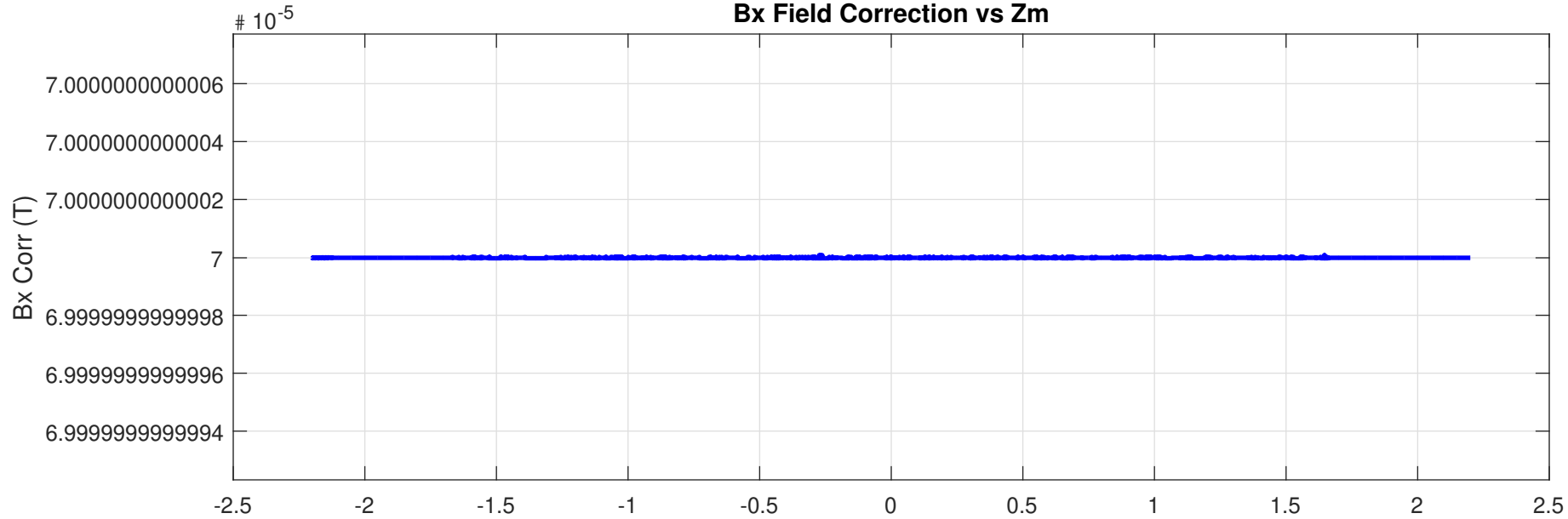
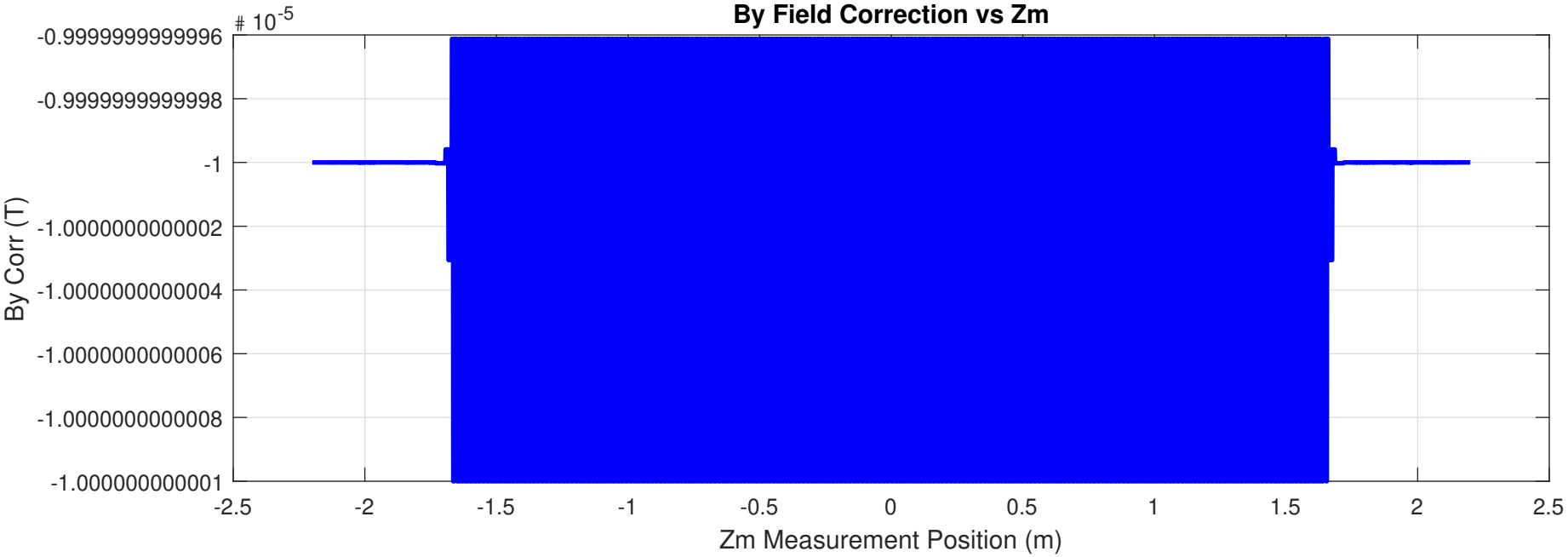
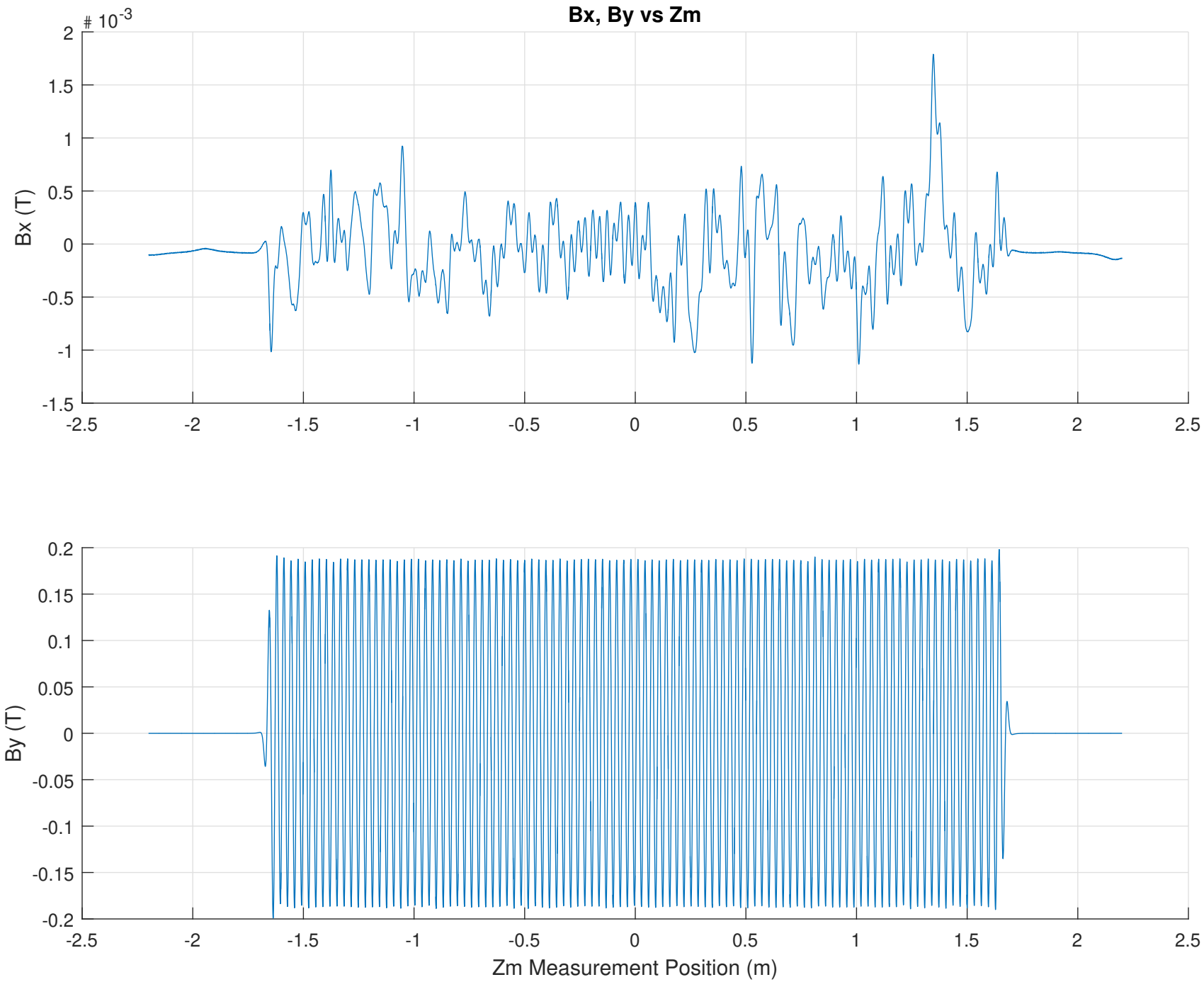
SLAC Magnetic Measurements

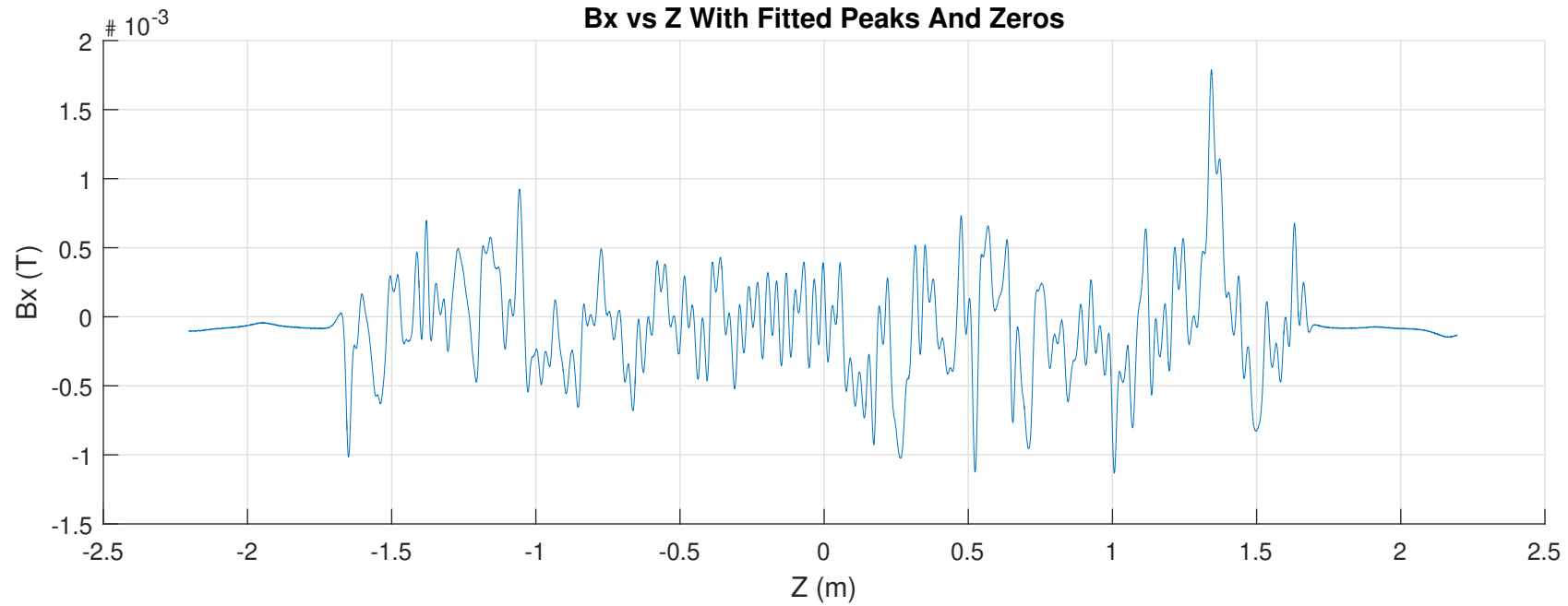
Planar Insertion Device Analysis

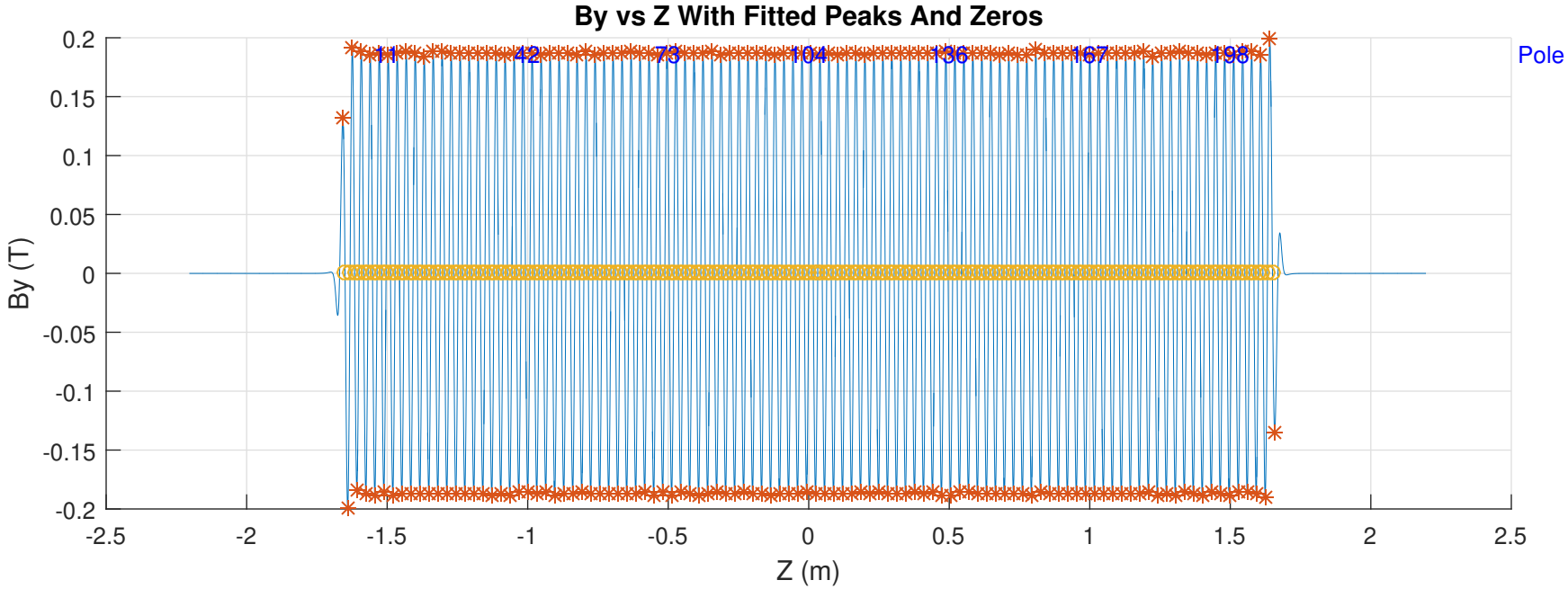
Parameters:
INPUT-FILE-DIR =V:\MET\MagServe\MagData\LCLS-II\Undulator\LBNL Data\AnalysisExample\
INPUT-FILE-NAME =1-x0-y0-gap25.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =1
GAMMA =7827.79
NOM-LAMBDA-U =0.03
NOM-K-VALUE =3.0531
NOM-LAMBDA-R =1.3857e-09
NUM-POLES =212
NUM-END-POLES =6
CELL-LENGTH =4.4

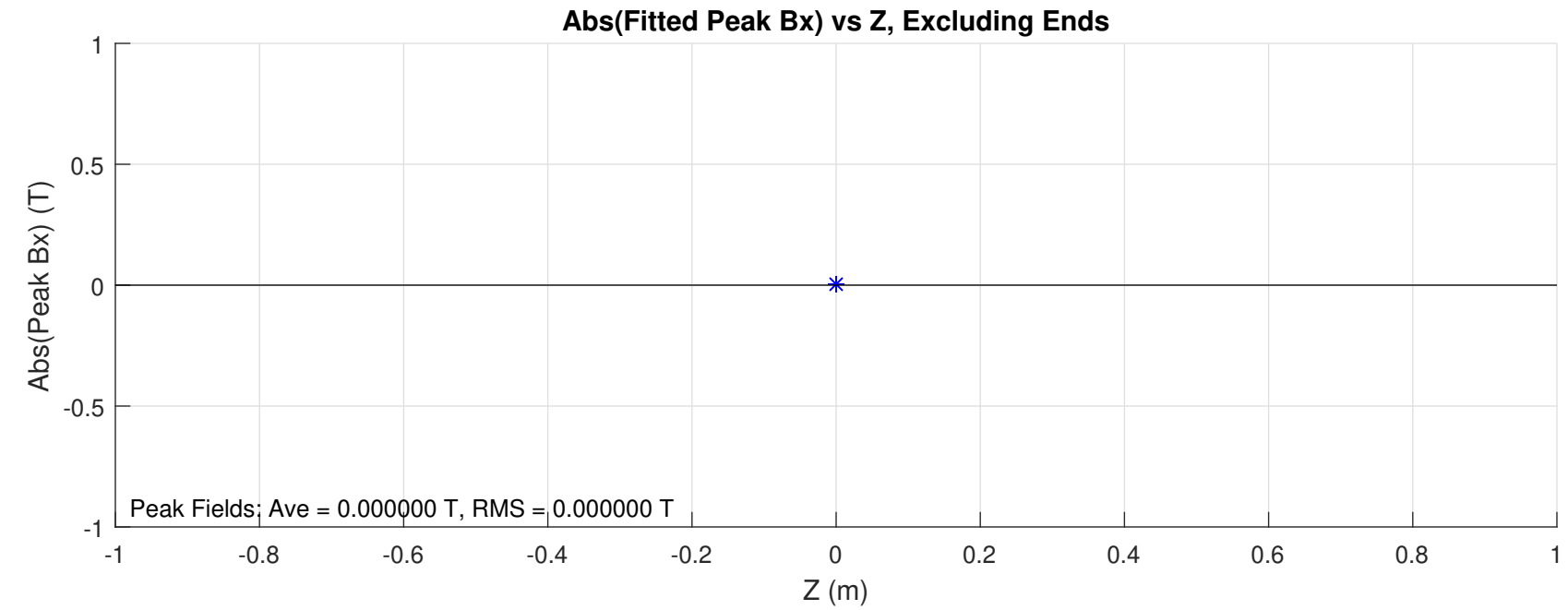

Bx Field Correction vs Zm
10^-5
7.0000000000006
7.0000000000004
7.0000000000002
7
6.9999999999998
6.9999999999996
6.9999999999994
Bx Corr (T)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

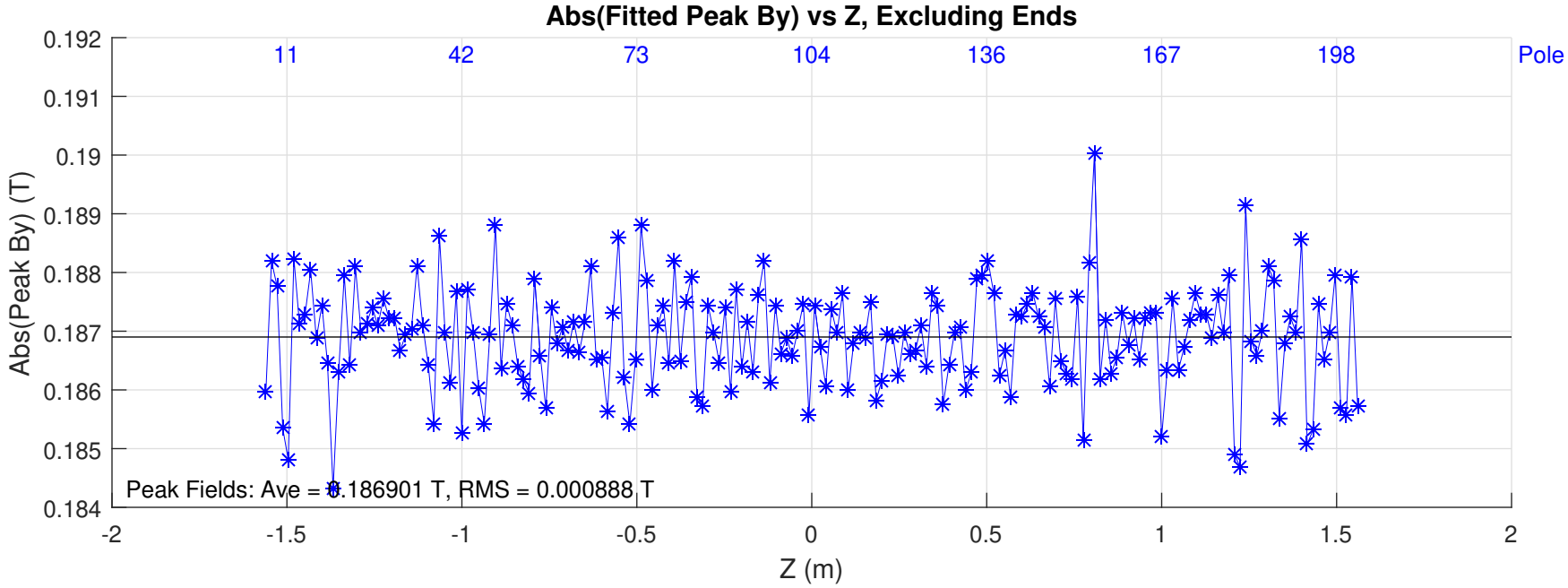

By Field Correction vs Zm
10^-5
-0.9999999999996
-0.9999999999998
-1
-1.0000000000002
-1.0000000000004
-1.0000000000006
-1.0000000000008
-1.000000000001
By Corr (T)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Zm Measurement Position (m)

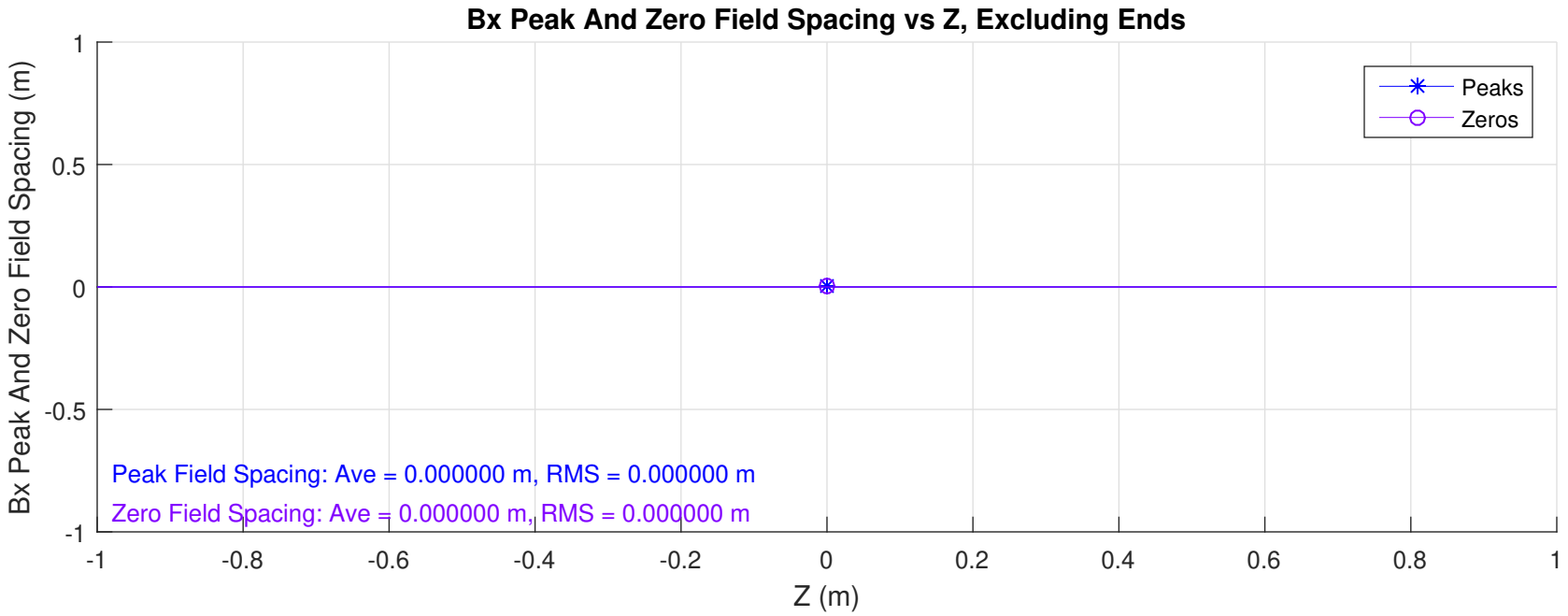

Bx, By vs Zm
10^-3
Bx (T)
By (T)
Zm Measurement Position (m)

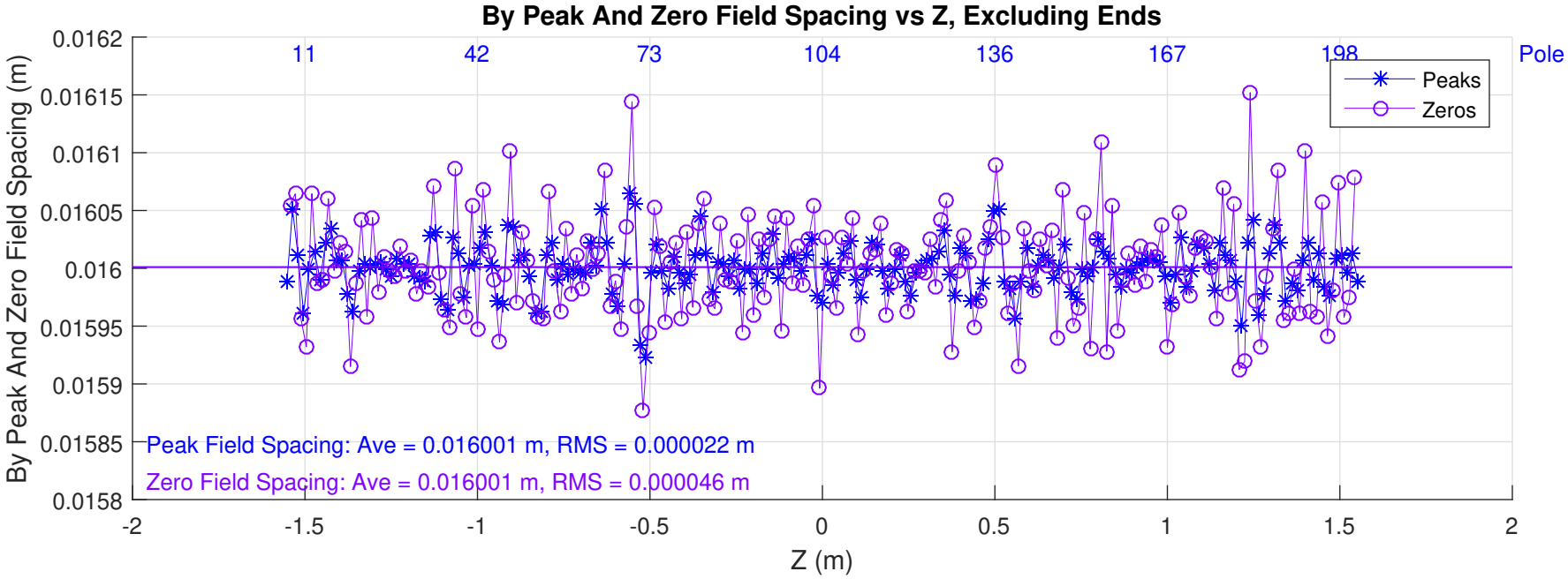

Bx vs Z With Fitted Peaks And Zeros
10^-3
Bx (T)
Z (m)

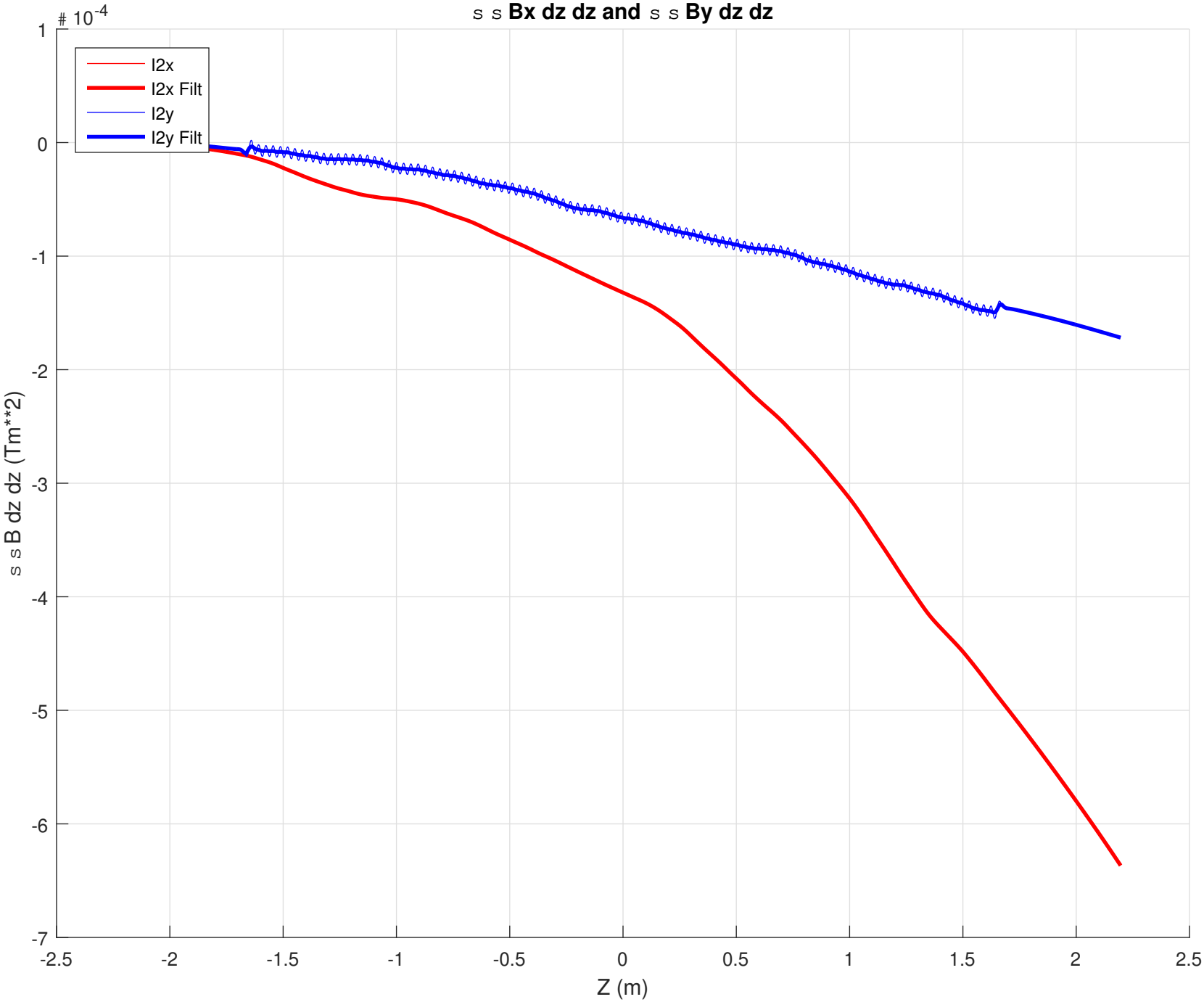

By vs Z With Fitted Peaks And Zeros
By (T)
Z (m)
Pole
11
42
73
104
136
167
198

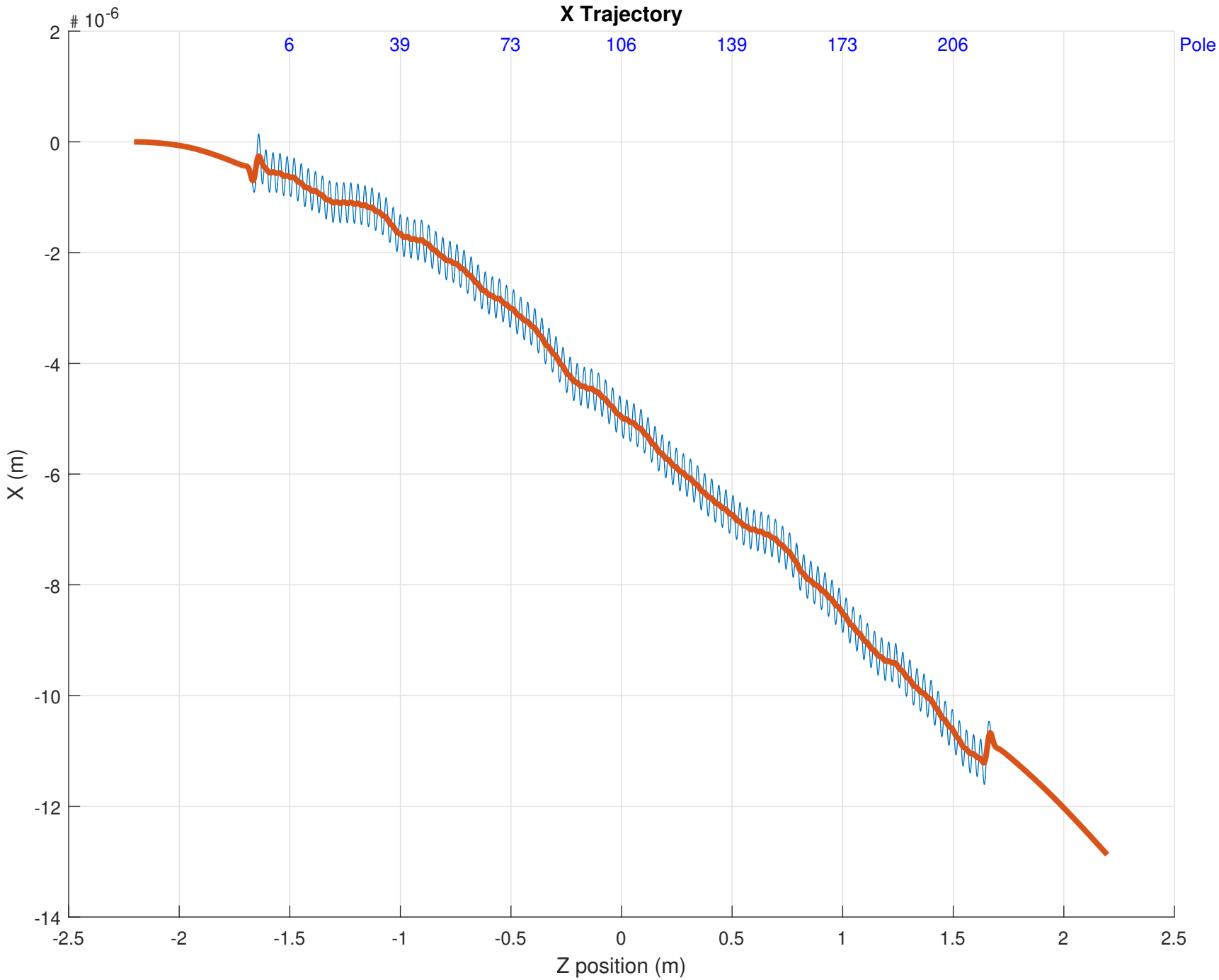

Abs(Fitted Peak Bx) vs Z, Excluding Ends
Abs(Peak Bx) (T)
Z (m)
Peak Fields: Ave = 0.000000 T, RMS = 0.000000 T
1
0.5
0
-0.5
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1

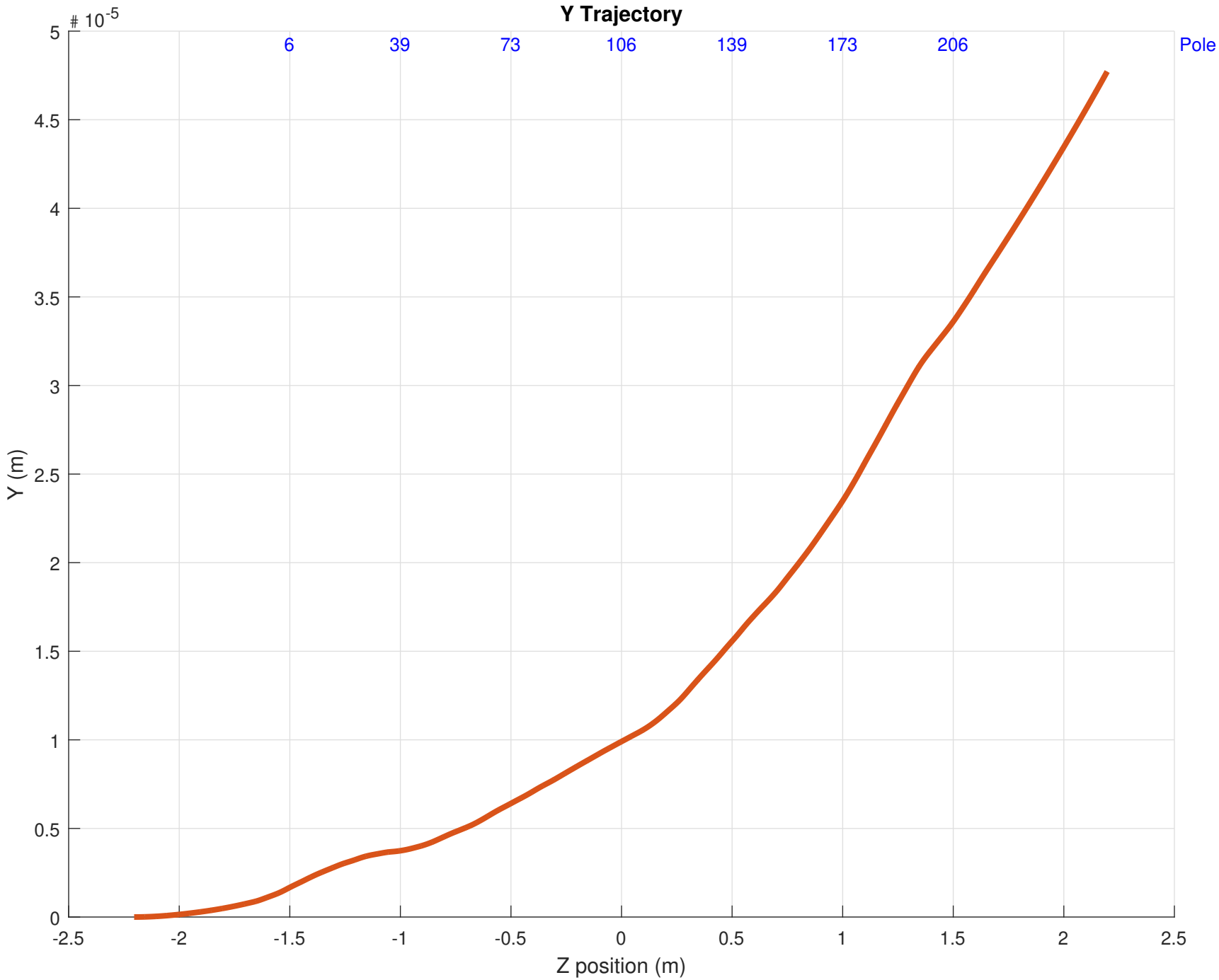

Abs(Fitted Peak By) vs Z, Excluding Ends
Abs(Peak By) (T)
Z (m)
Peak Fields: Ave = 0.186901 T, RMS = 0.000888 T
11
42
73
104
136
167
198
Pole
0.192
0.191
0.19
0.189
0.188
0.187
0.186
0.185
0.184
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

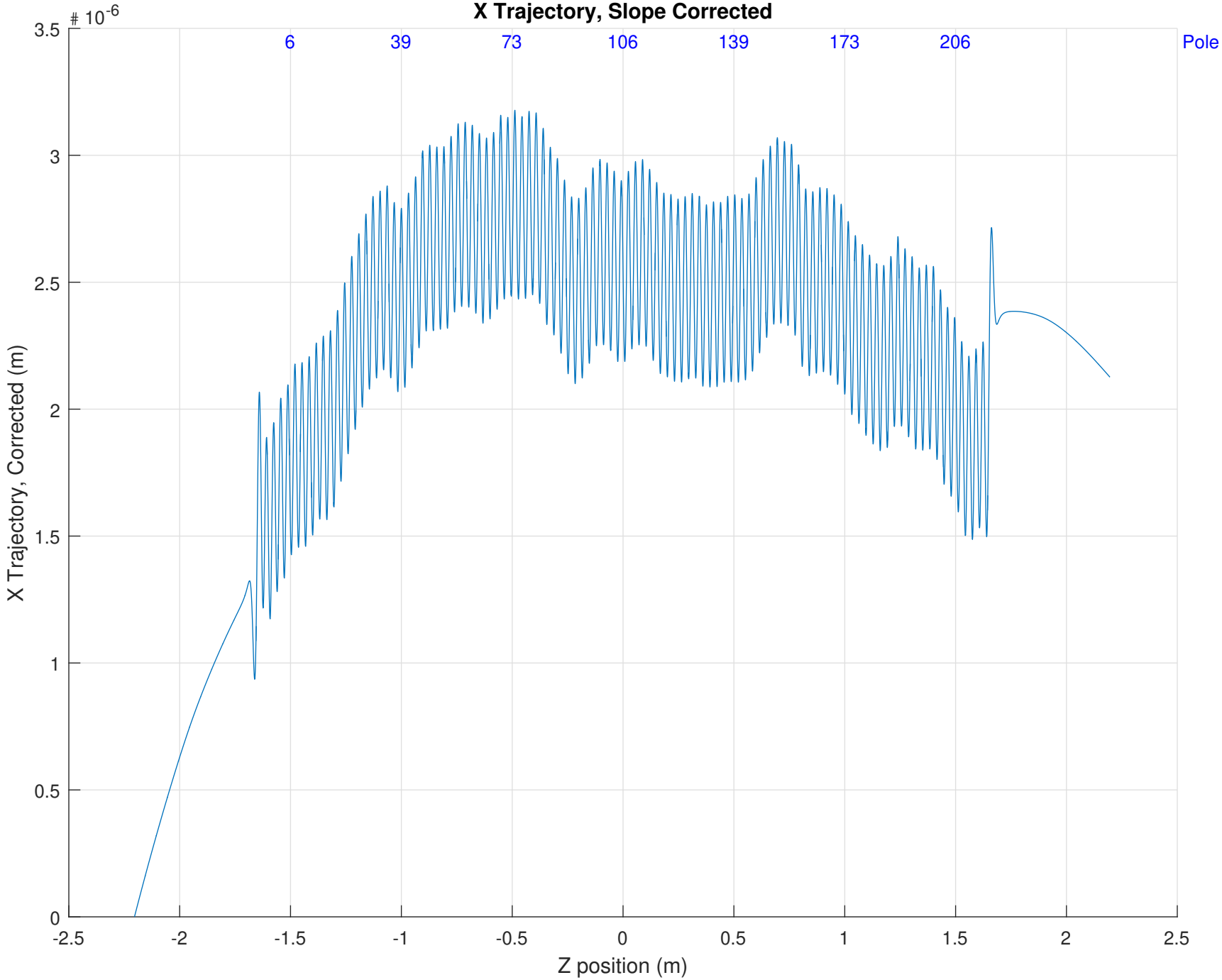

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Peaks
Zeros
Peak Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
Zero Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m

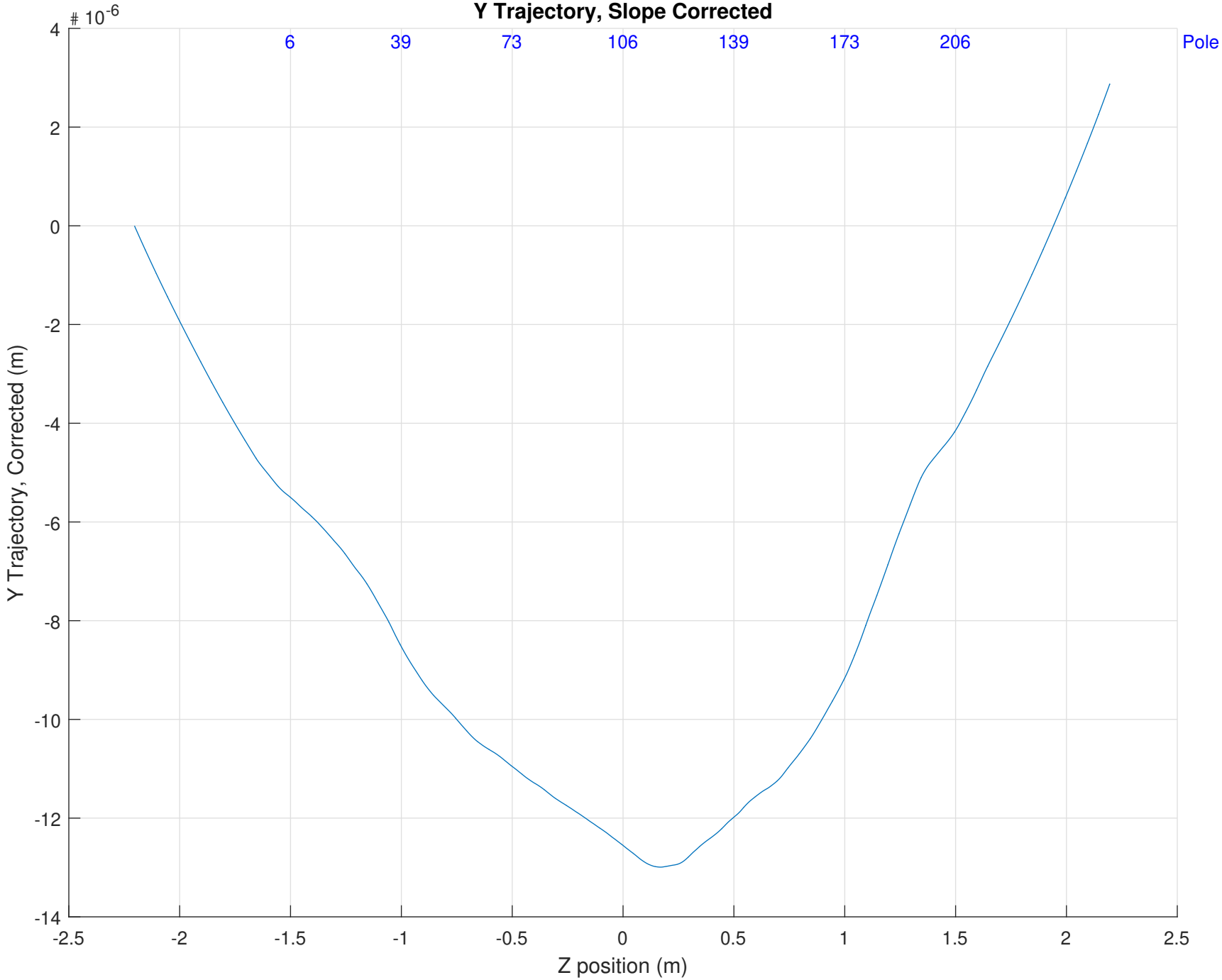

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
11
42
73
104
136
167
198
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.016001 m, RMS = 0.000022 m
Zero Field Spacing: Ave = 0.016001 m, RMS = 0.000046 m

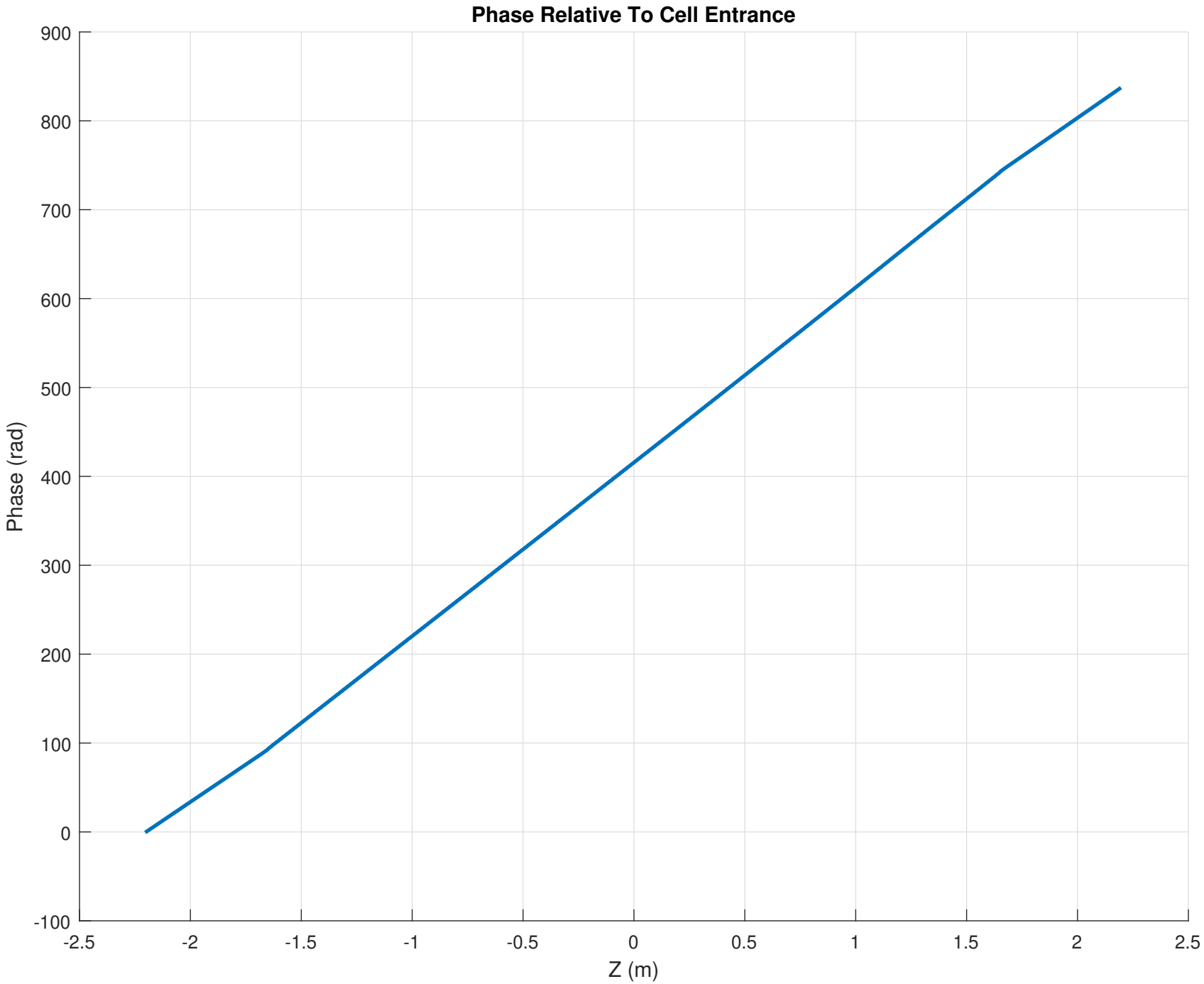

s s Bx dz dz and s s By dz dz
10^-4
I2x
I2x Filt
I2y
I2y Filt
s s B dz dz (Tm**2)
Z (m)
1
0
-1
-2
-3
-4
-5
-6
-7
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

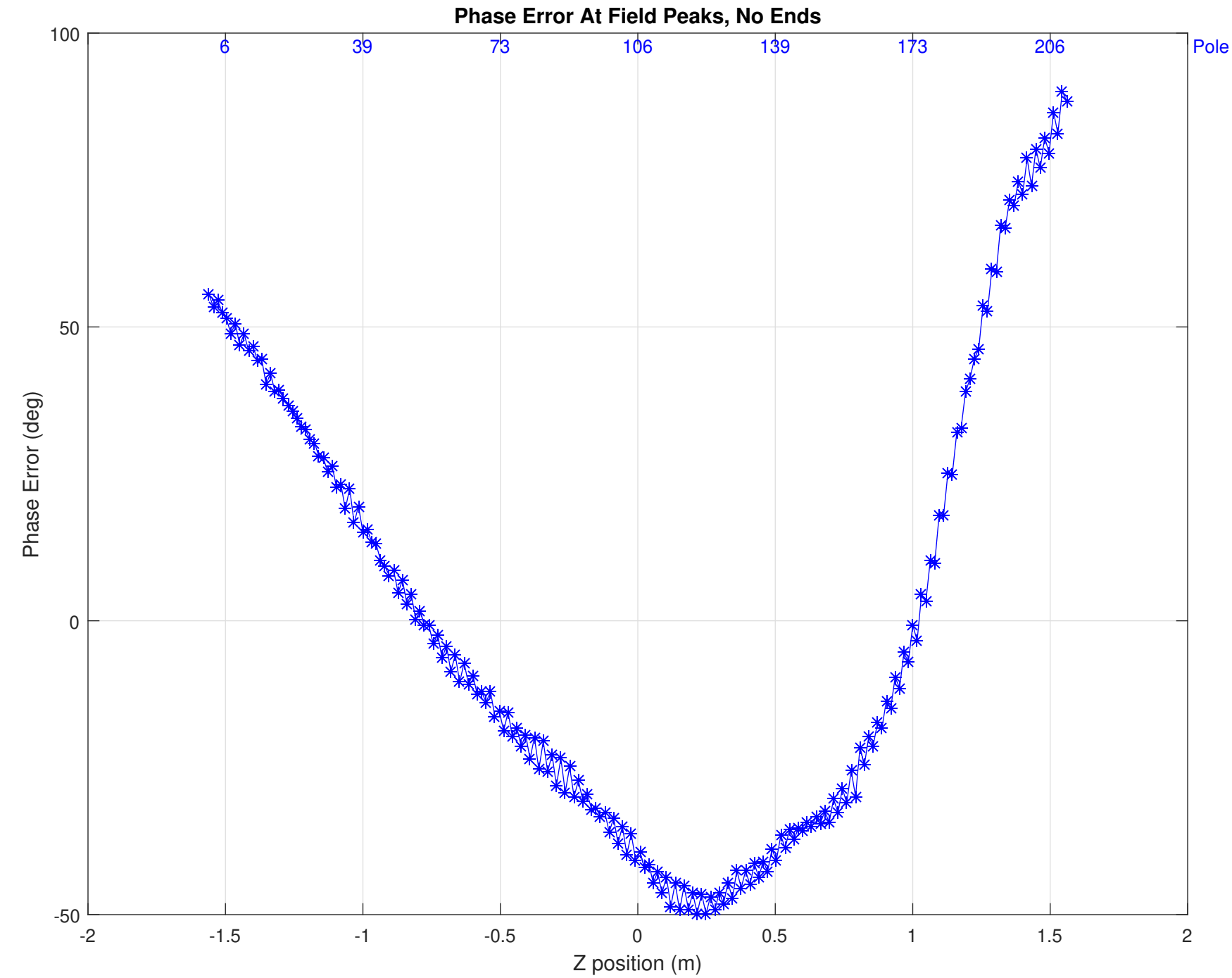

X Trajectory
10^-6
6
39
73
106
139
173
206
Pole
2
0
-2
-4
-6
-8
-10
-12
-14
X (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


Y Trajectory
10^-5
6
39
73
106
139
173
206
Pole
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Y (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

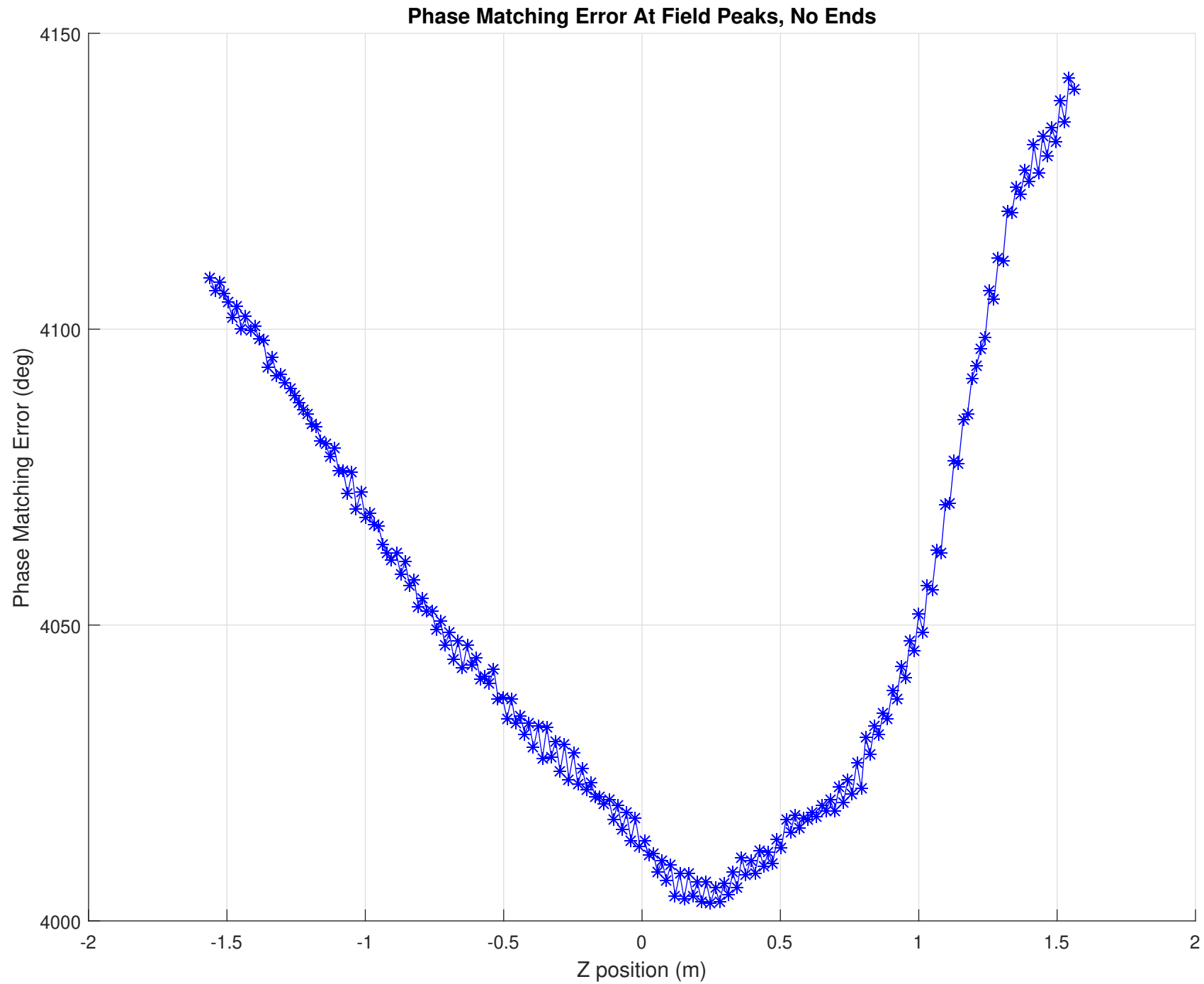

X Trajectory, Slope Corrected
10^-6
6
39
73
106
139
173
206
Pole
3.5
3
2.5
2
1.5
1
0.5
0
X Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


Y Trajectory, Slope Corrected
10^-6
6
39
73
106
139
173
206
Pole
4
2
0
-2
-4
-6
-8
-10
-12
-14
Y Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

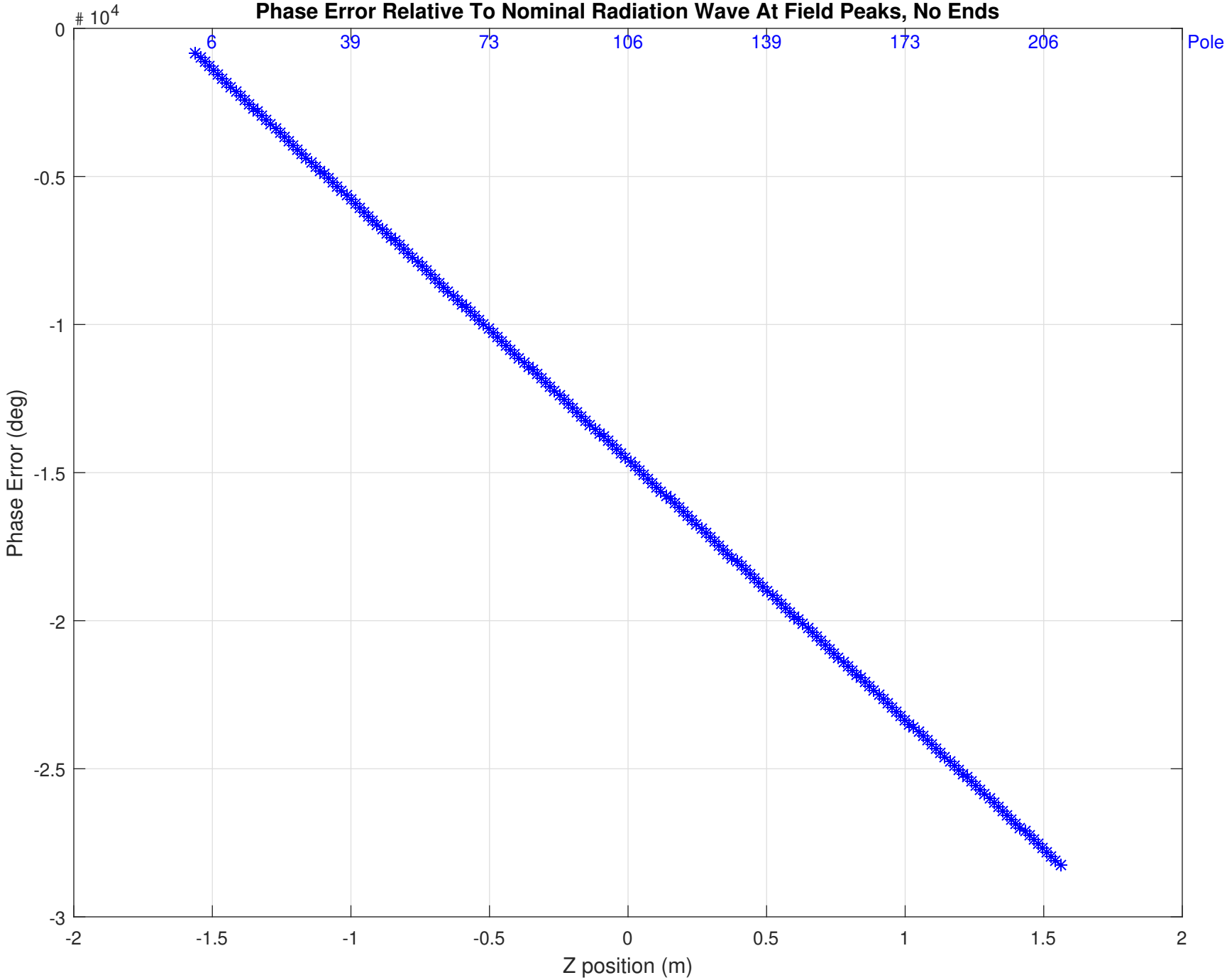

Phase Relative To Cell Entrance
900
800
700
600
500
400
300
200
100
0
-100
Phase (rad)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z (m)



Phase Error: Ave = -0.000000 deg, RMS = 38.665163 deg



Phase Match Error: Ave = 4052.947327 deg, RMS = 38.579328 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
Phase Error (deg)
6
39
73
106
139
173
206
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)