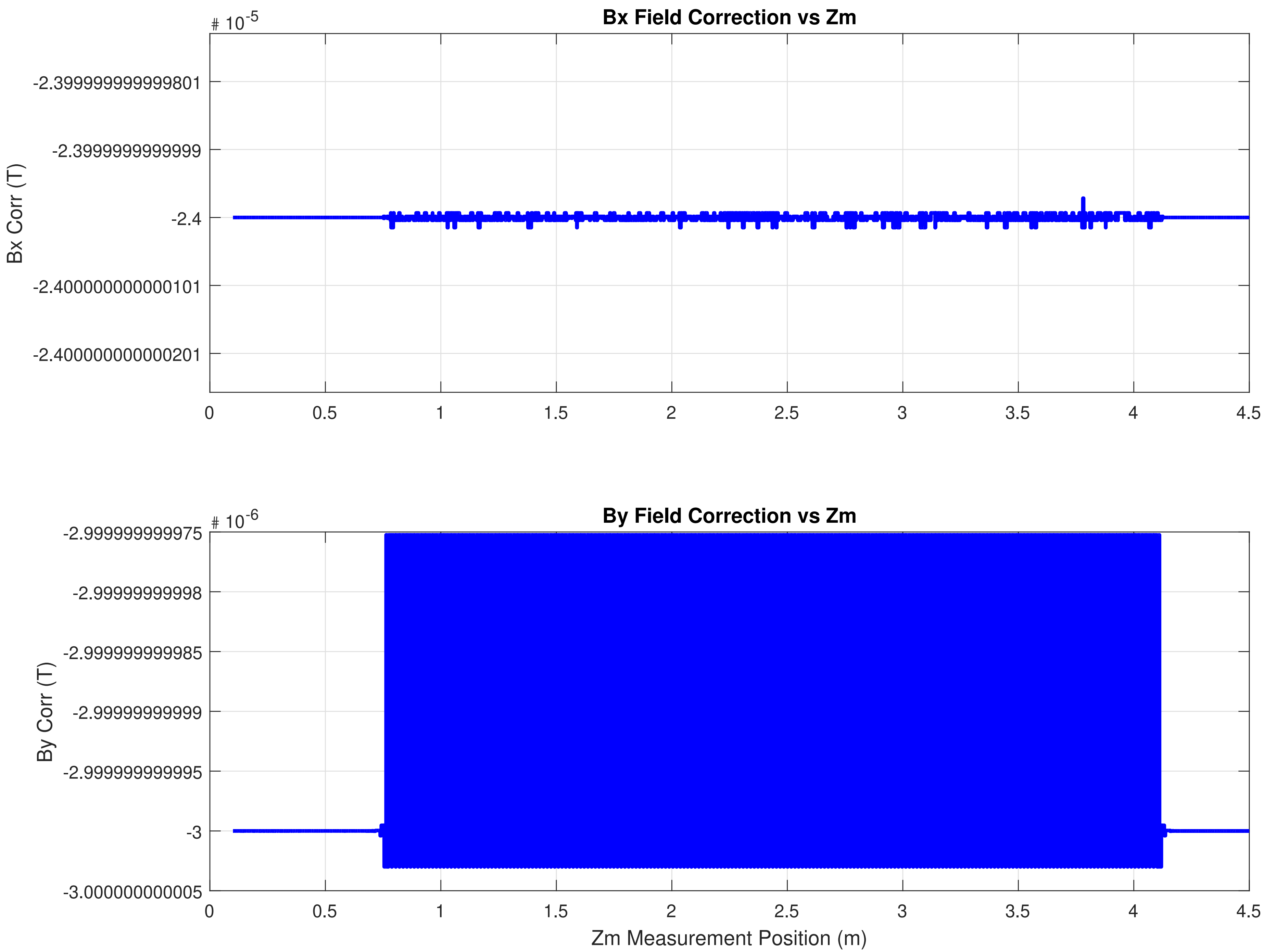
SLAC Magnetic Measurements

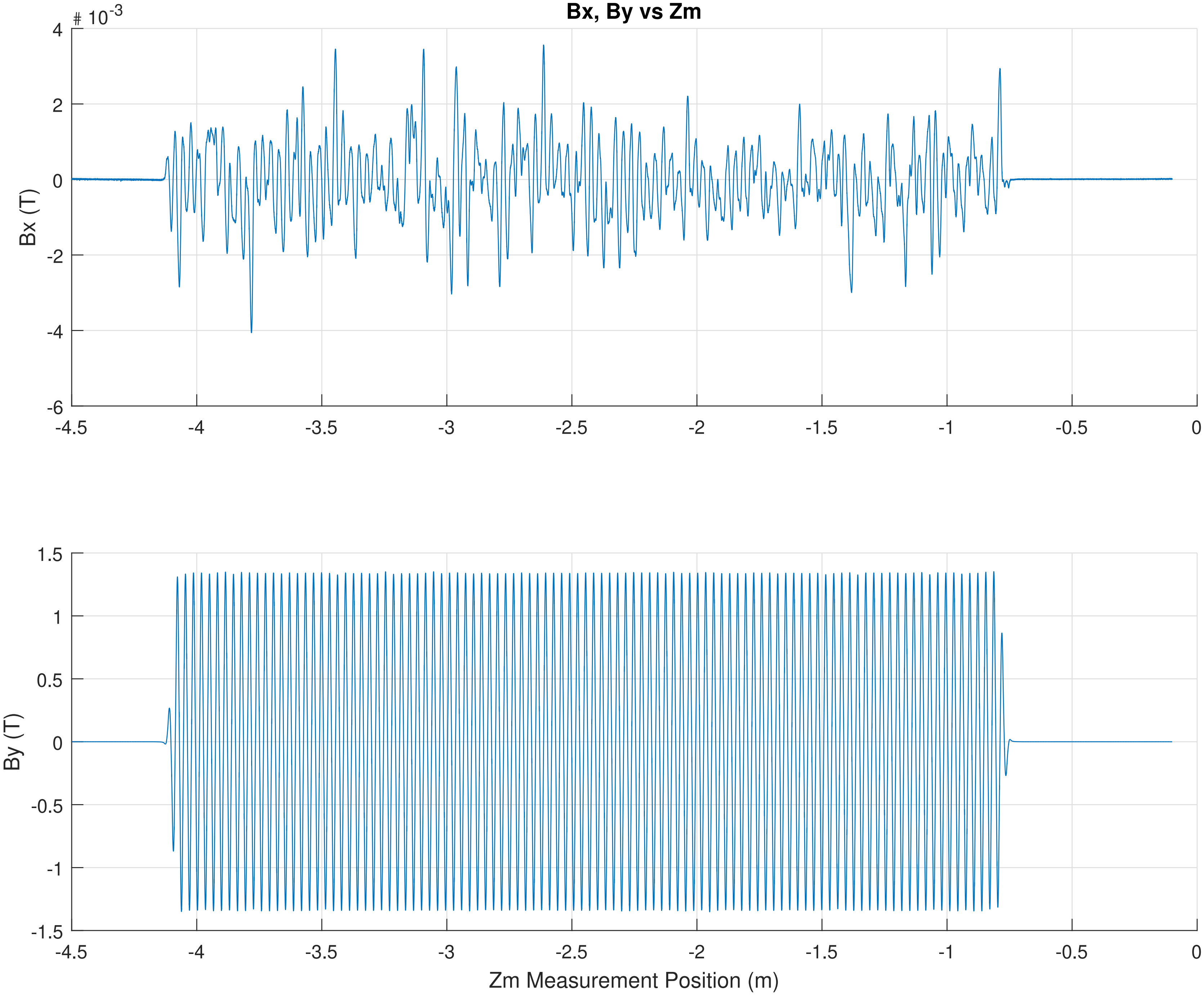
Planar Insertion Device Analysis

Parameters:

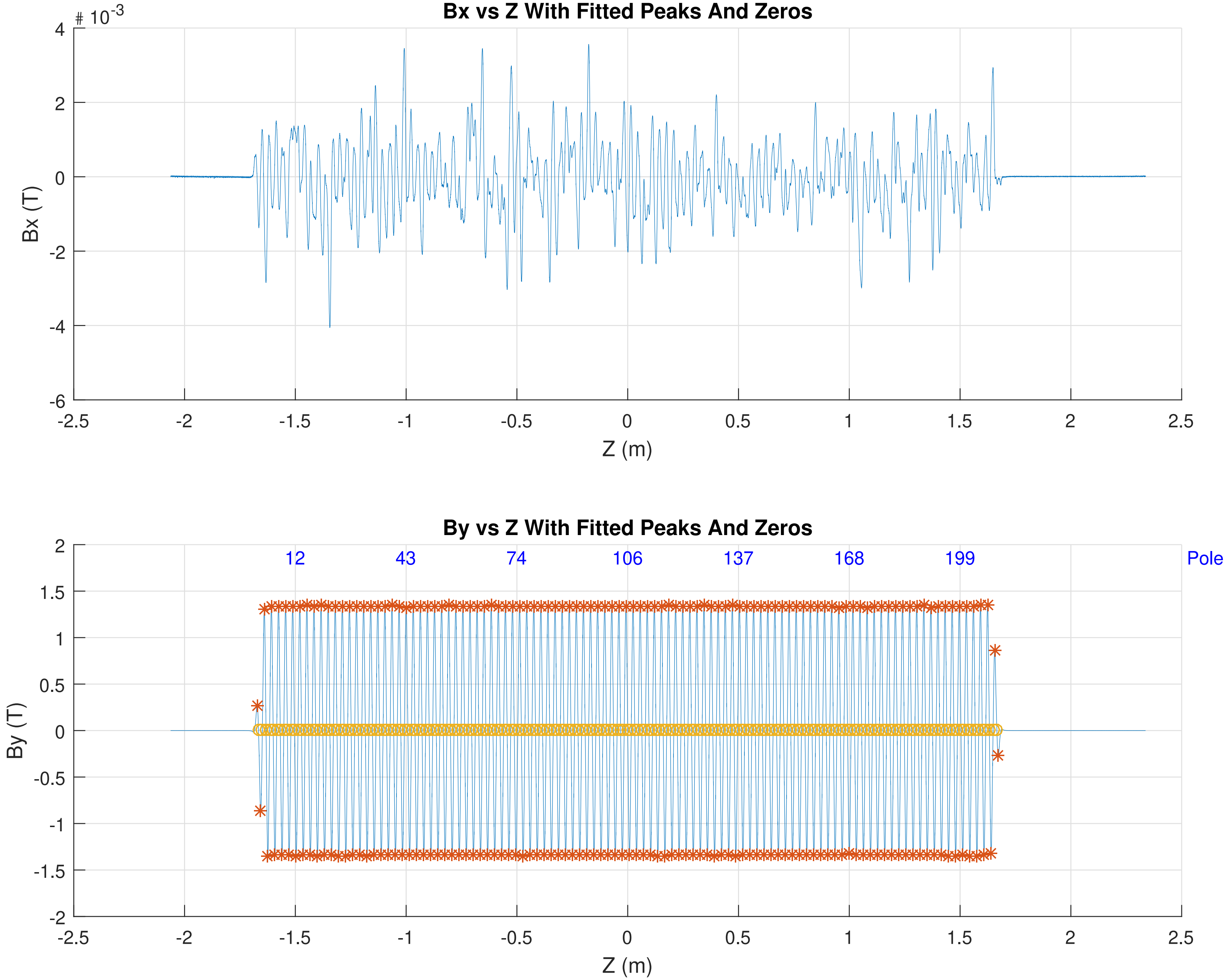
INPUT-FILE-DIR =s:\magdata\LCLS2\Undulator\HXU-32\DATASET0001\Rough Tuning\Z Scans\Run 001\
INPUT-FILE-NAME =x+00000-y+100-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =1
GAMMA =7827.79
NOM-LAMBDA-U =0.03
NOM-K-VALUE =2.6963
NOM-LAMBDA-R =1.3857e-09
NUM-POLES =210
NUM-END-POLES =6
CELL-LENGTH =4.4



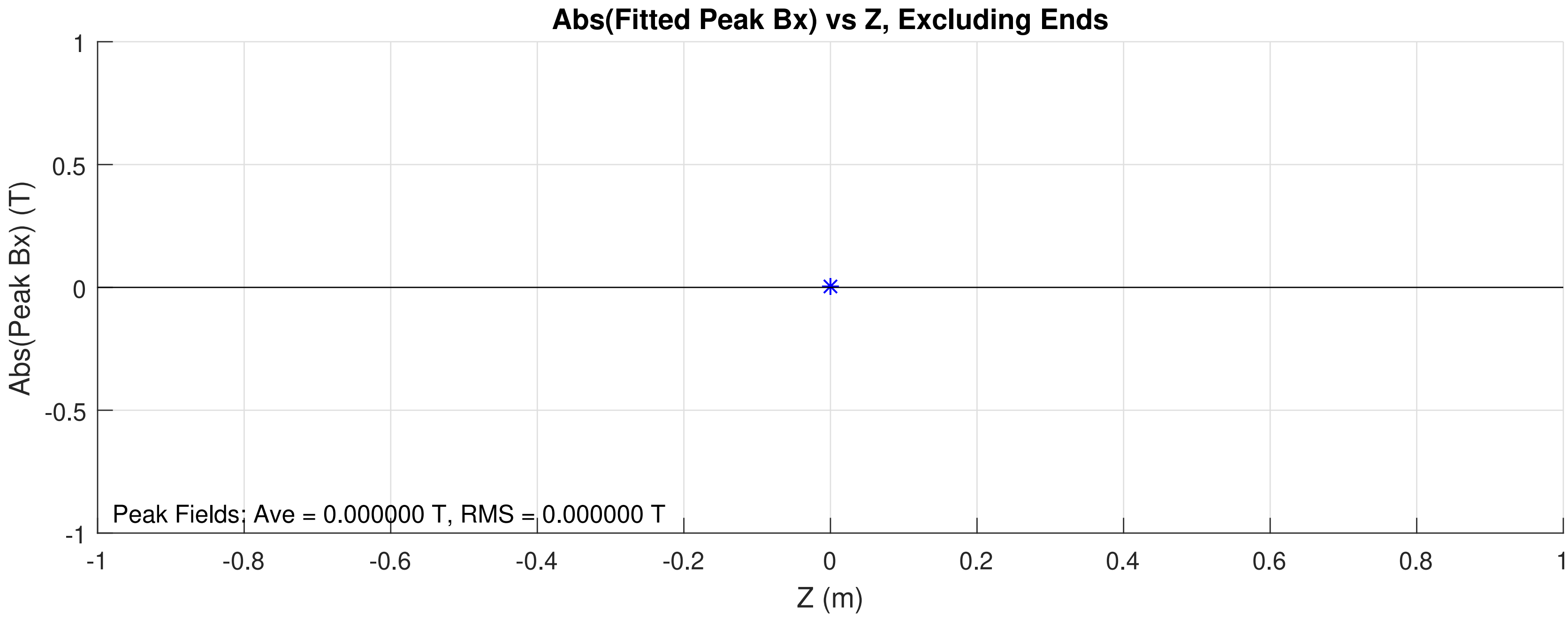
Bx Field Correction vs Zm
10^-5
-2.399999999999801
-2.3999999999999
-2.4
-2.400000000000101
-2.400000000000201
Bx Corr (T)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
By Field Correction vs Zm
10^-6
-2.999999999975
-2.99999999998
-2.999999999985
-2.99999999999
-2.999999999995
-3
-3.000000000005
By Corr (T)
Zm Measurement Position (m)

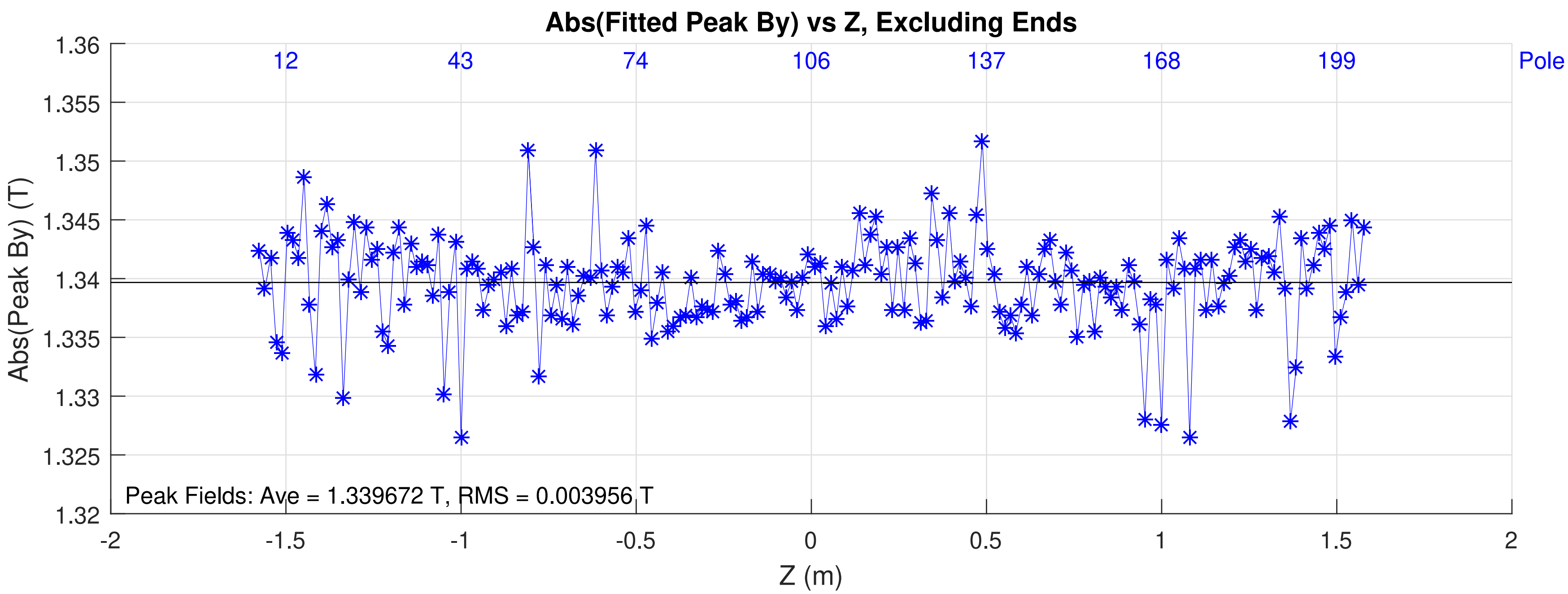


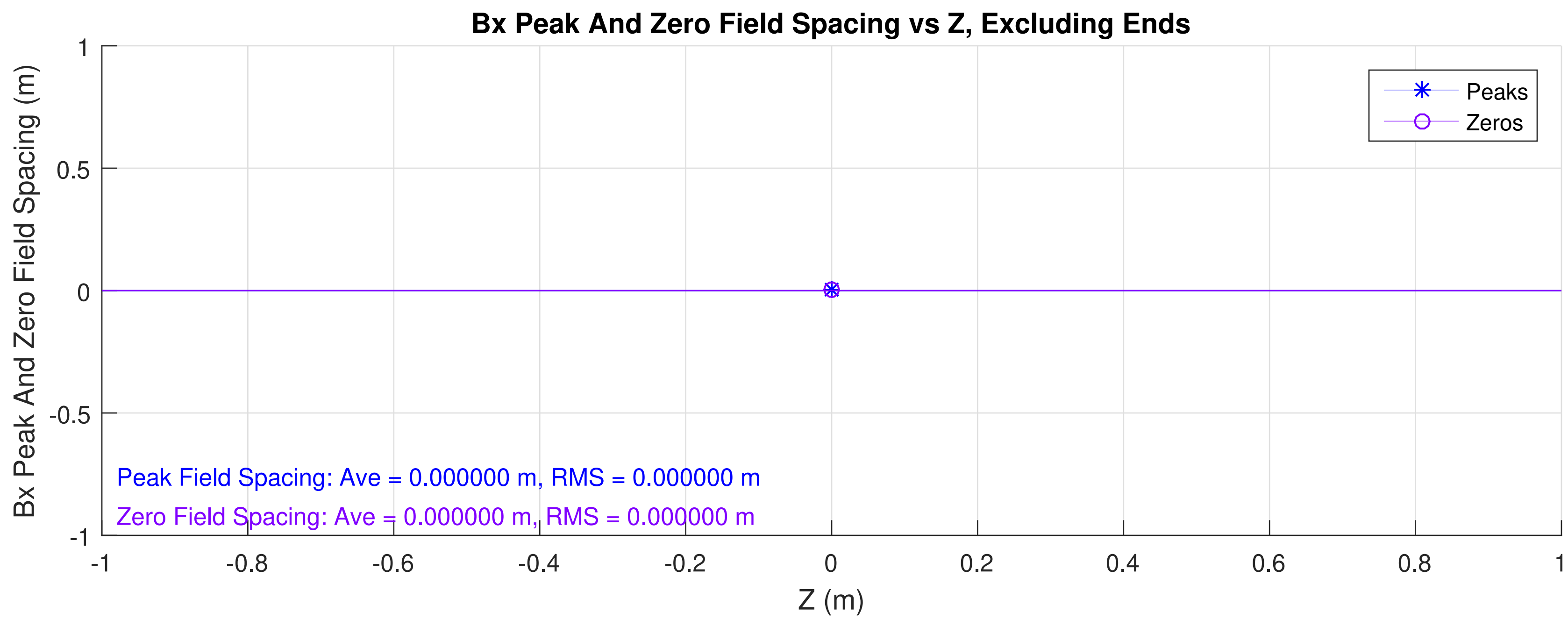
Bx, By vs Zm
10-3
Bx (T)
4
2
0
-2
-4
-6
-4.5
-4
-3.5
-3
-2.5
-2
-1.5
-1
-0.5
0
By (T)
1.5
1
0.5
0
-0.5
-1
-1.5
Zm Measurement Position (m)

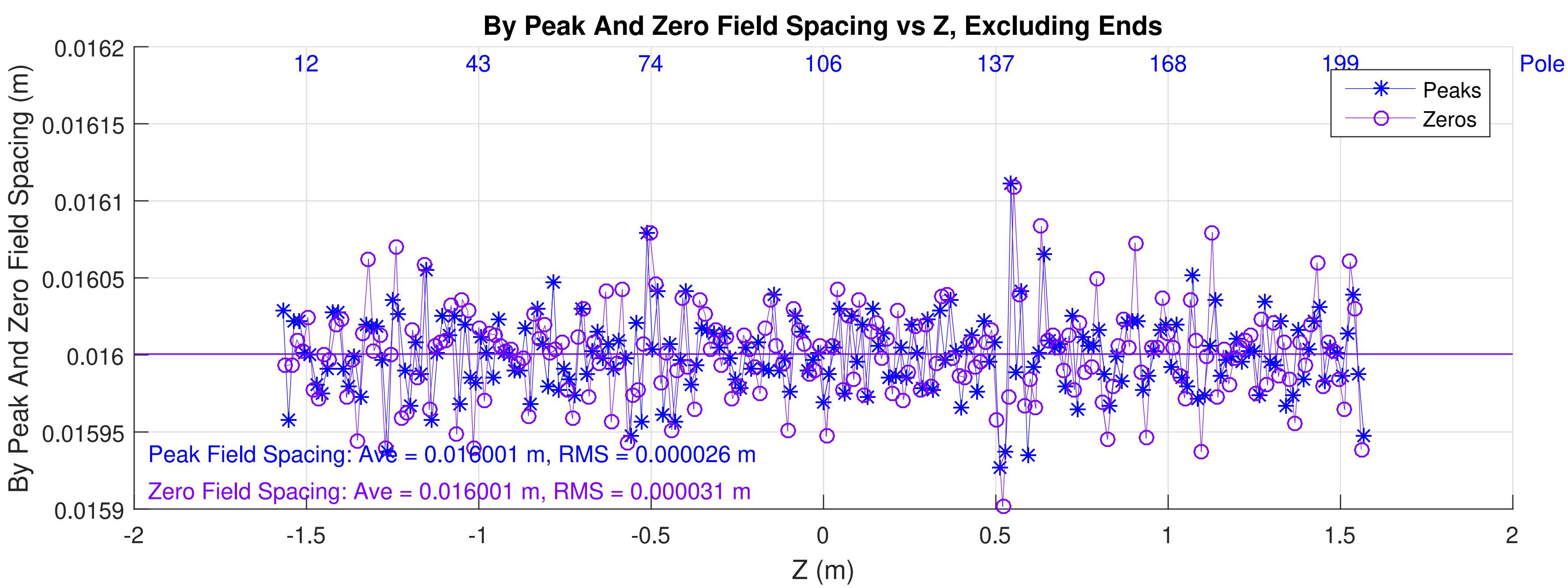


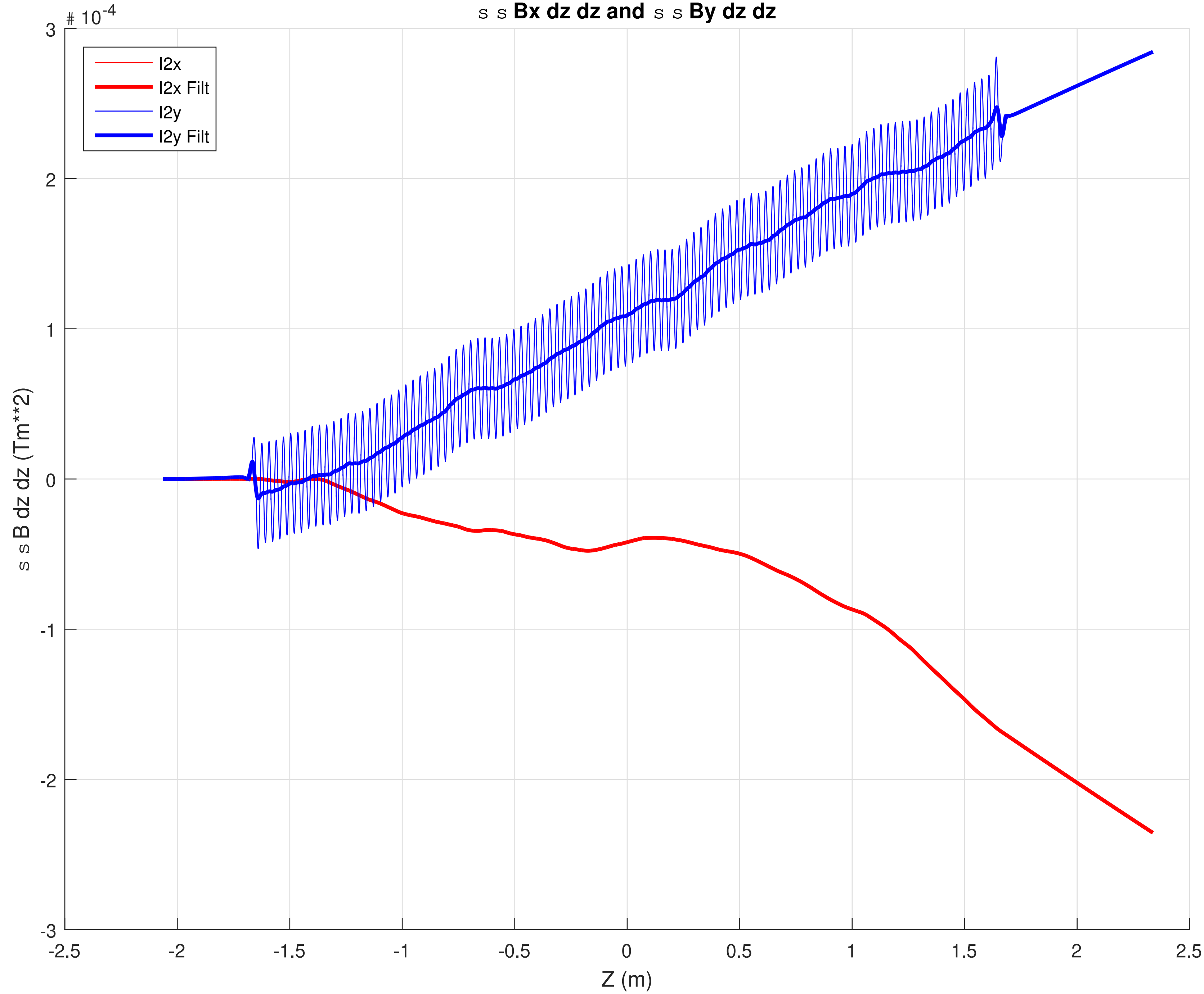
Bx vs Z With Fitted Peaks And Zeros
10-3
Bx (T)
Z (m)
By vs Z With Fitted Peaks And Zeros
12
43
74
106
137
168
199
Pole
By (T)
Z (m)


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

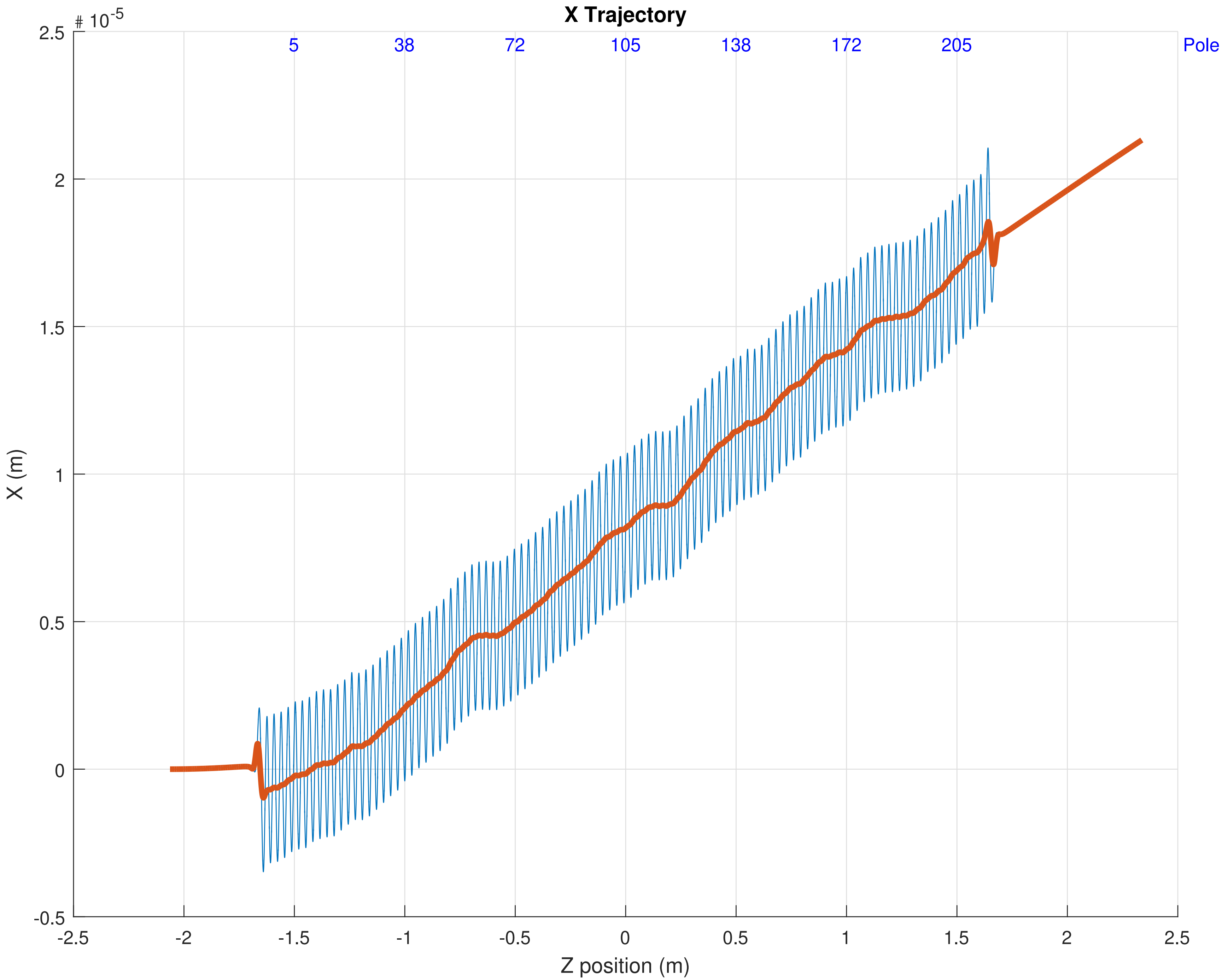

Abs(Fitted Peak By) vs Z, Excluding Ends
Abs(Peak By) (T)
Z (m)
Pole
12
43
74
106
137
168
199
Peak Fields: Ave = 1.339672 T, RMS = 0.003956 T
1.36
1.355
1.35
1.345
1.34
1.335
1.33
1.325
1.32
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

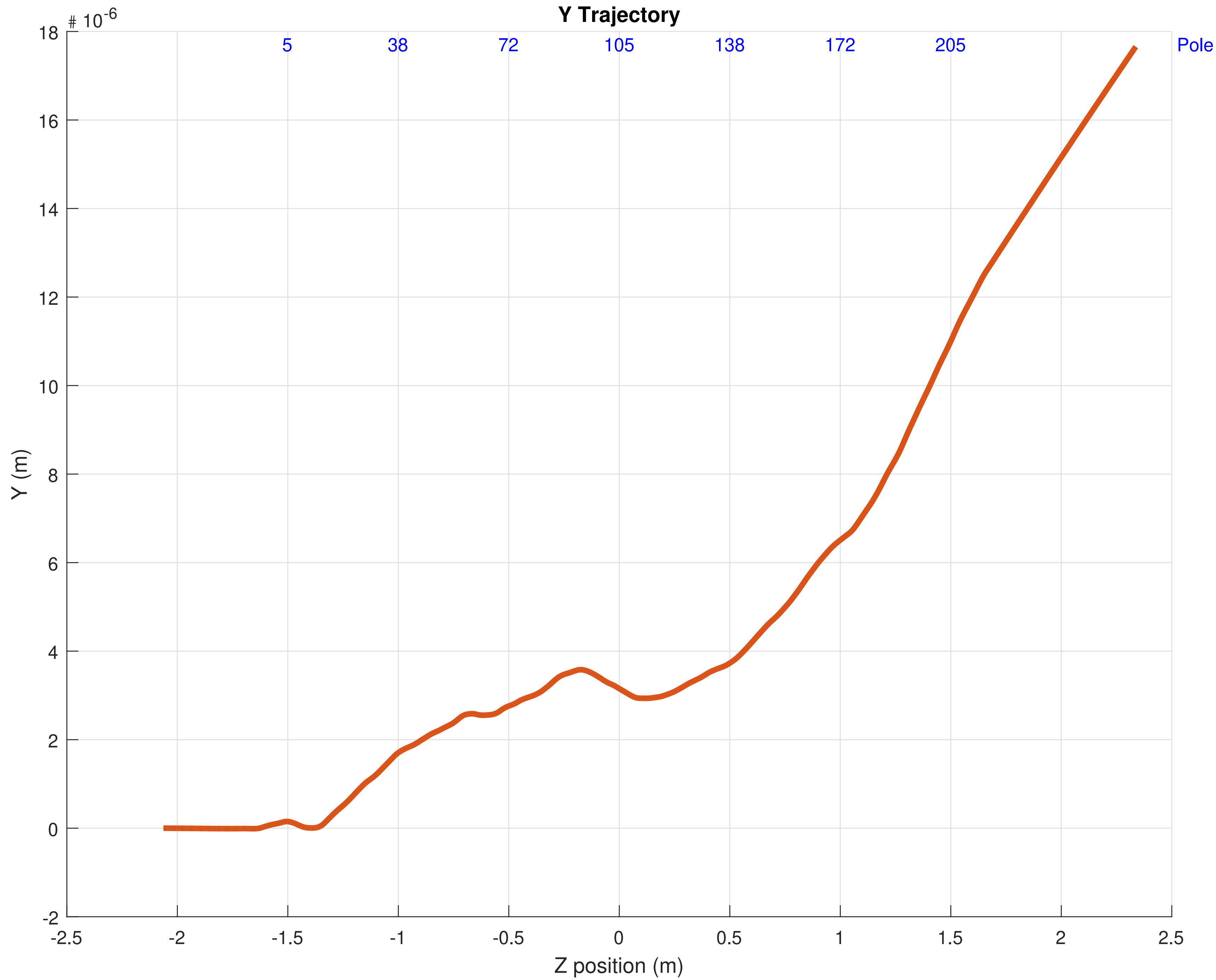

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Peaks
Zeros
Peak Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
Zero Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m


By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
12
43
74
106
137
168
199
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.016001 m, RMS = 0.000026 m
Zero Field Spacing: Ave = 0.016001 m, RMS = 0.000031 m

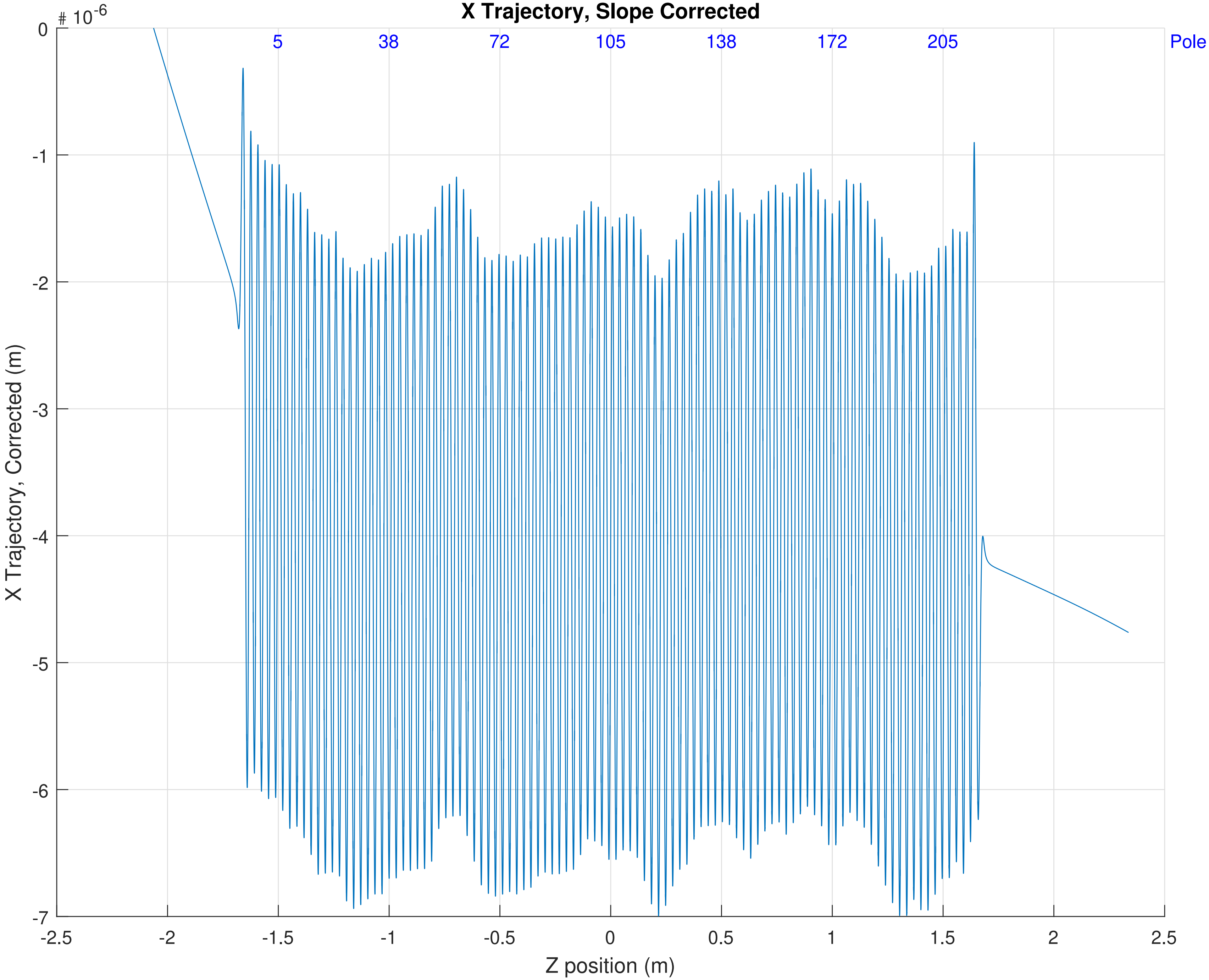


s s Bx dz dz and s s By dz dz
10^-4
3
2
1
0
-1
-2
-3
I2x
I2x Filt
I2y
I2y Filt
s s B dz dz (Tm**2)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z (m)

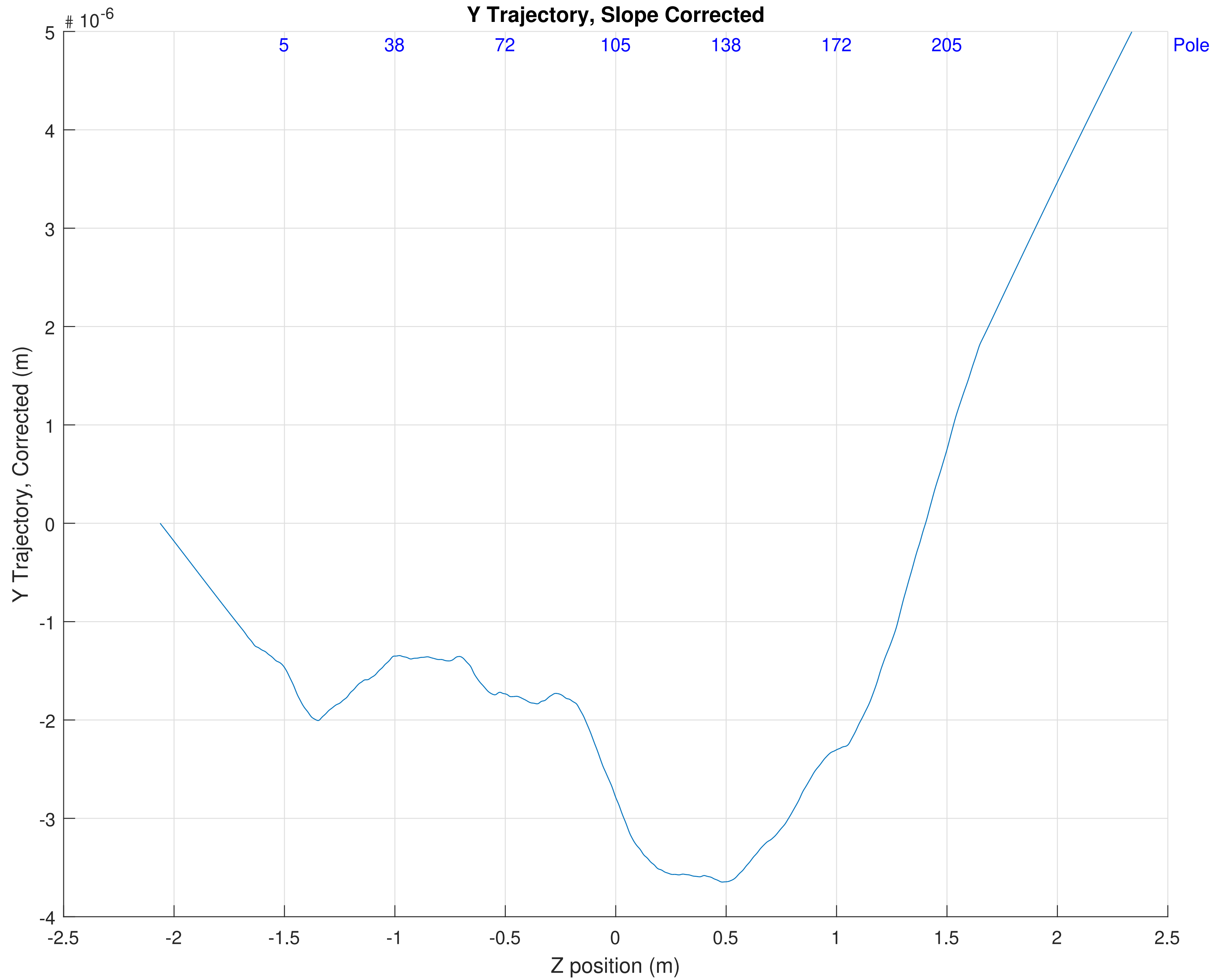

X Trajectory
10^-5
5
38
72
105
138
172
205
Pole
X (m)
Z position (m)
2.5
2
1.5
1
0.5
0
-0.5
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5



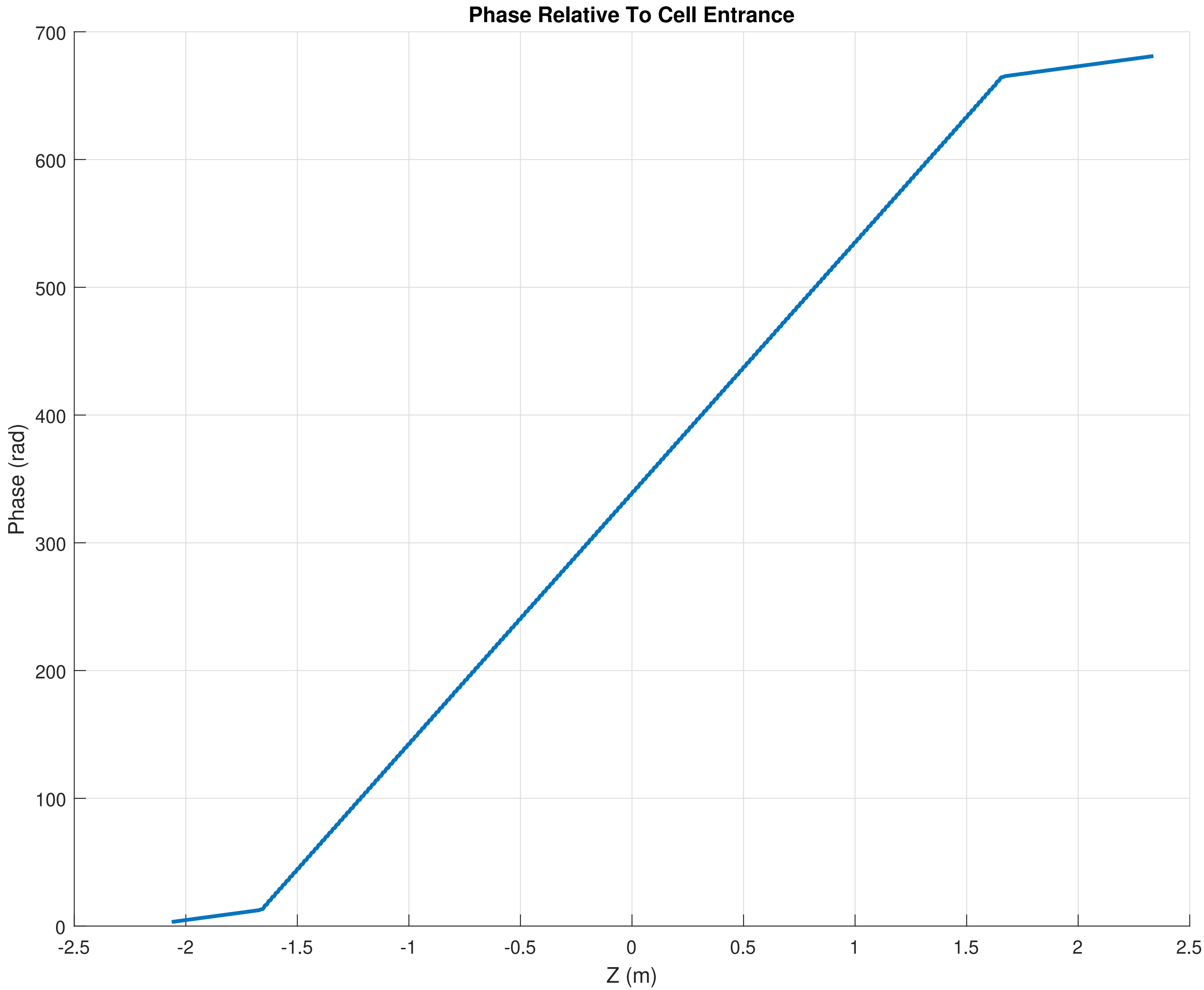
Y Trajectory
10-6
18
16
14
12
10
8
6
4
2
0
-2
Y (m)
5
38
72
105
138
172
205
Pole
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

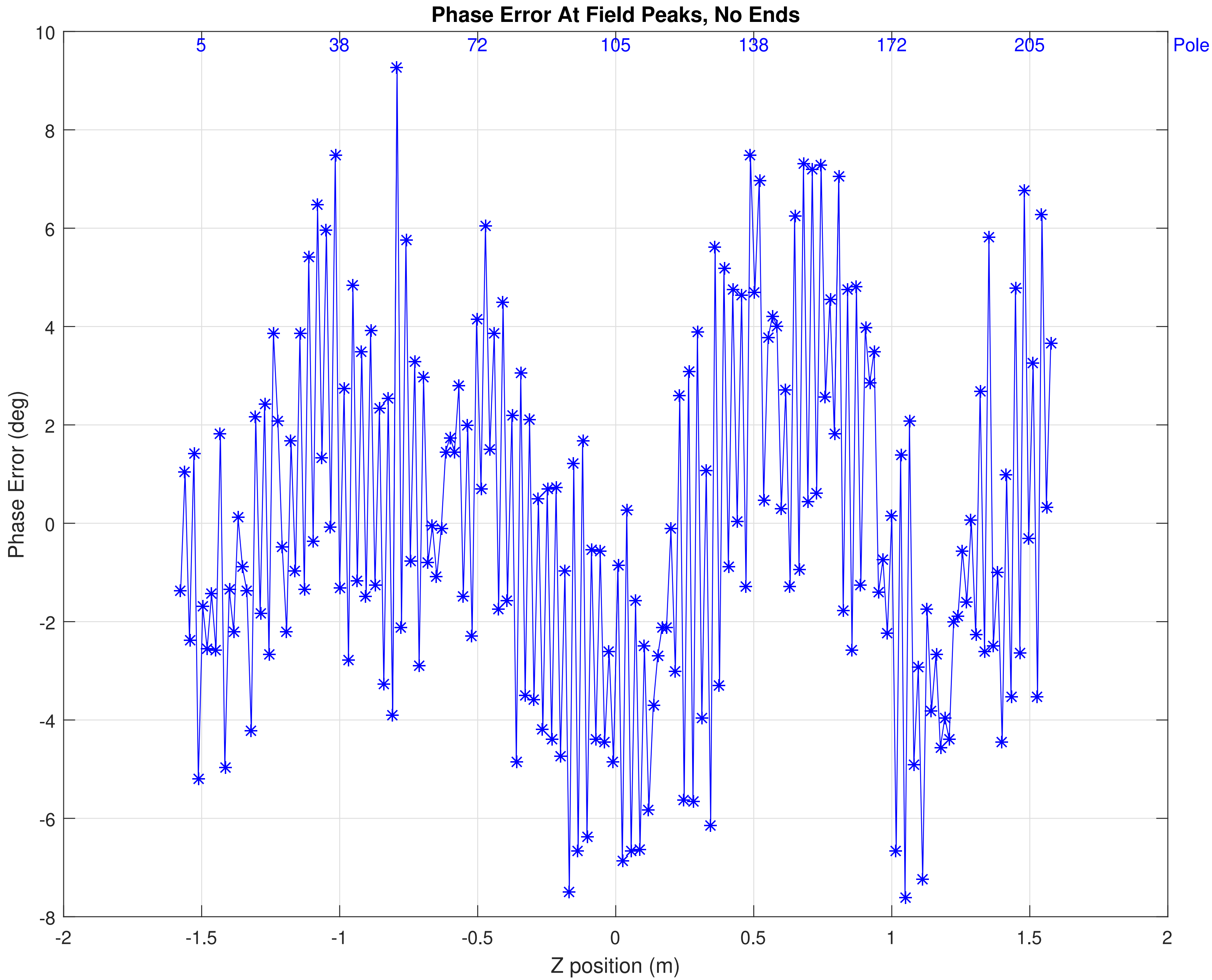


X Trajectory, Slope Corrected
10-6
Pole
5
38
72
105
138
172
205
0
-1
-2
-3
-4
-5
-6
-7
X Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

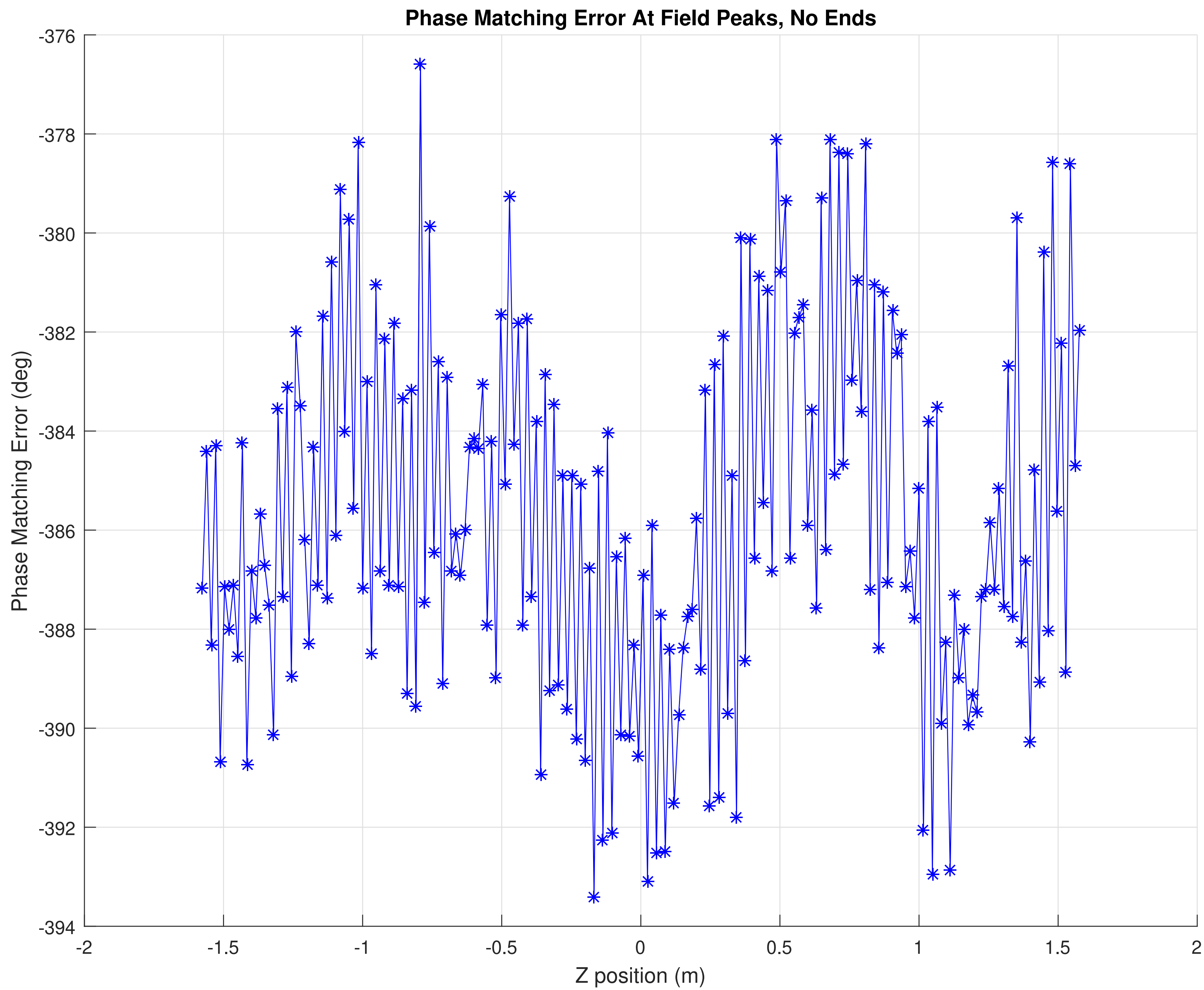


Y Trajectory, Slope Corrected
10-6
5
38
72
105
138
172
205
Pole
Y Trajectory, Corrected (m)
Z position (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
5
4
3
2
1
0
-1
-2
-3
-4

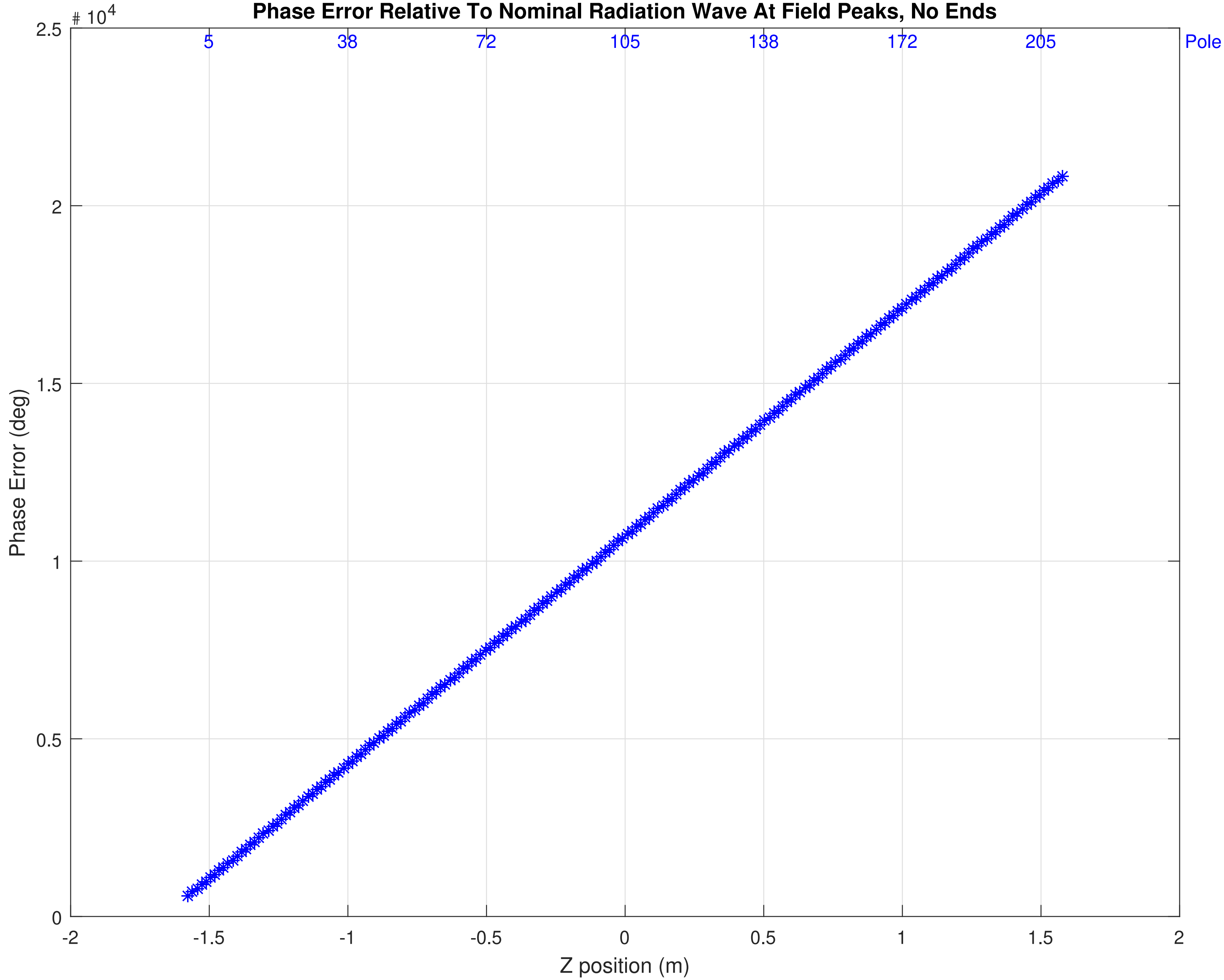

Phase Relative To Cell Entrance
Phase (rad)
0
100
200
300
400
500
600
700
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z (m)



Phase Error: Ave = -0.000000 deg, RMS = 3.668644 deg



Phase Match Error: Ave = -385.696724 deg, RMS = 3.693627 deg



Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
10^4
2.5
2
1.5
1
0.5
0
Phase Error (deg)
5
38
72
105
138
172
205
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)