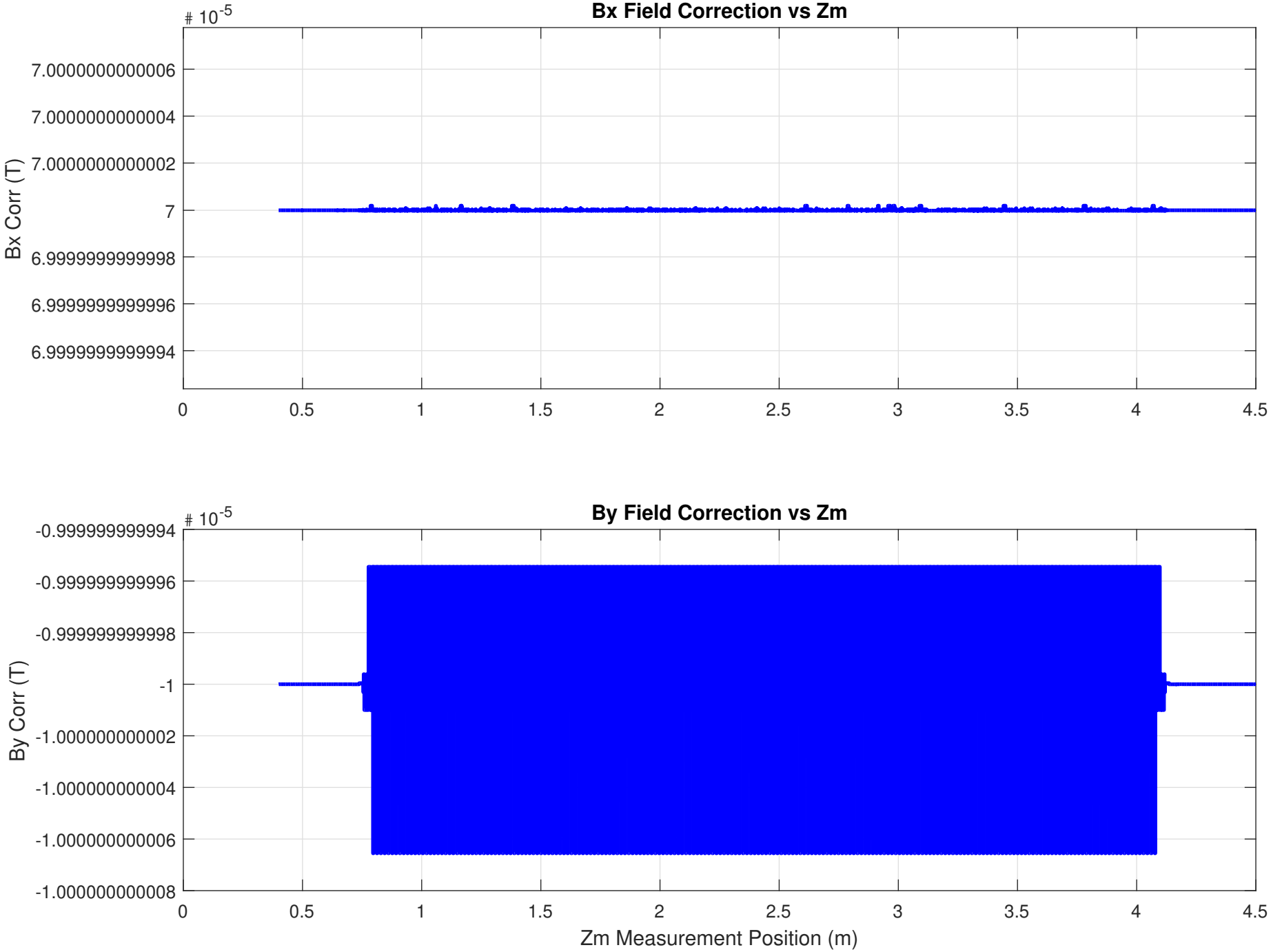
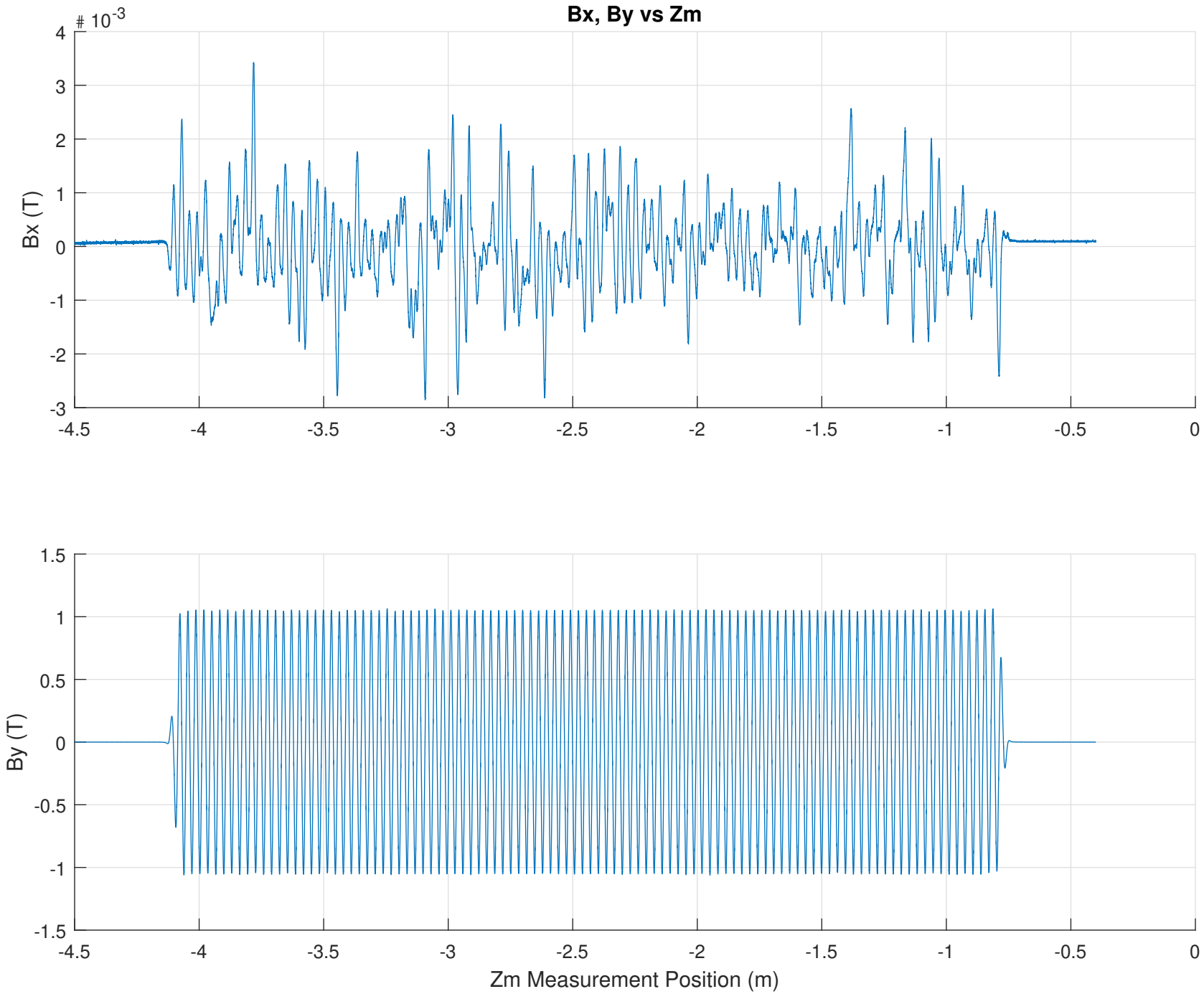
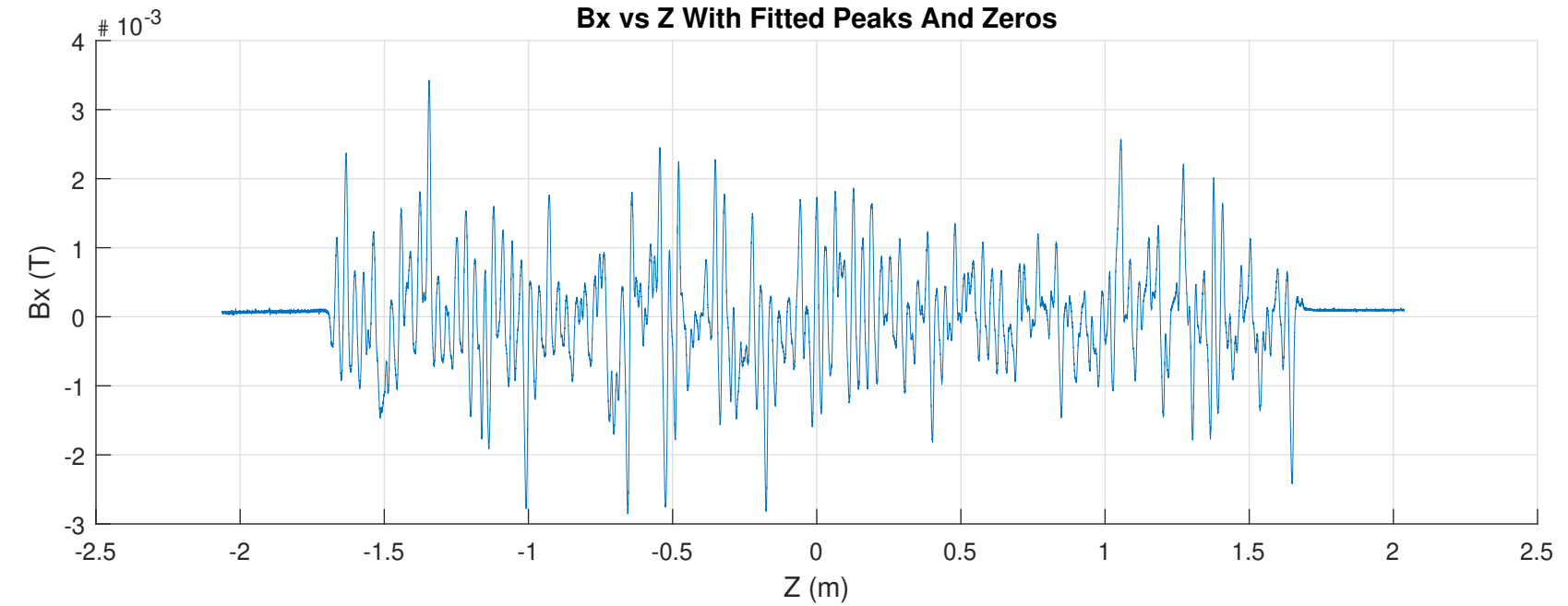
SLAC Magnetic Measurements

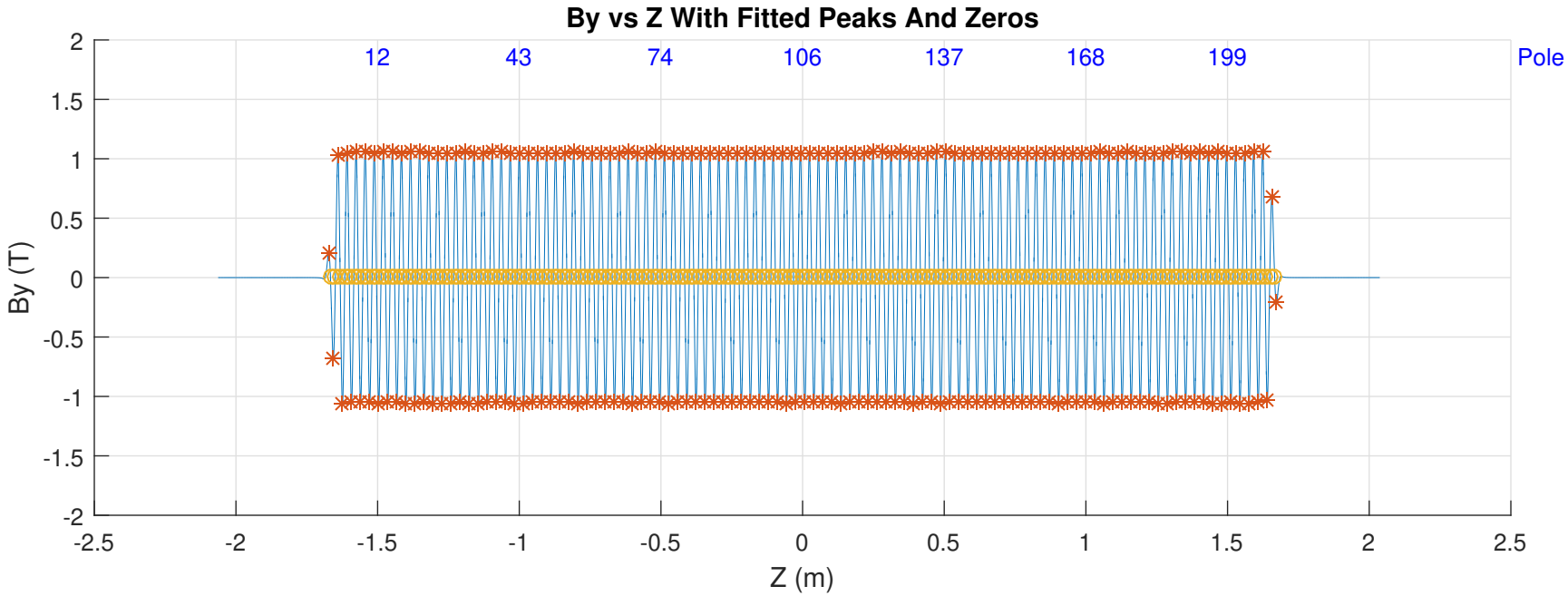
Planar Insertion Device Analysis

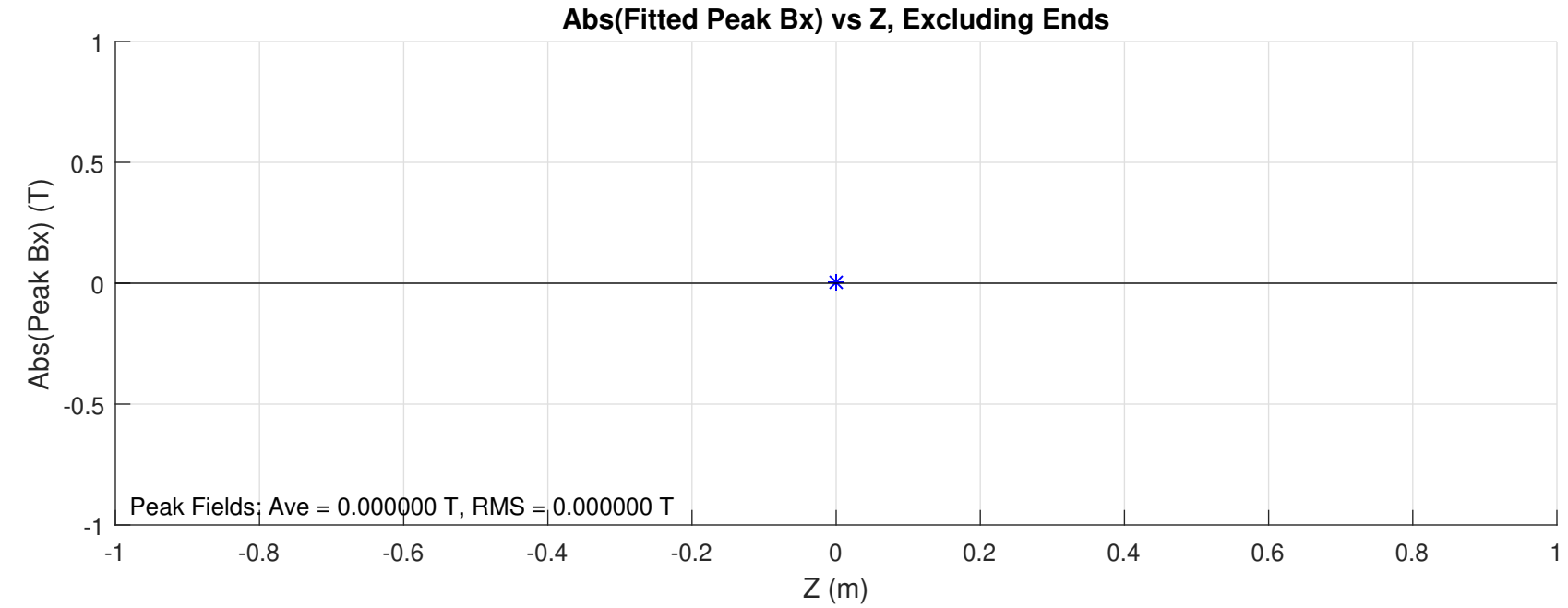
Parameters:
INPUT-FILE-DIR =S:\MagData\LCLS2\Undulator\HXU-32\DATASET0001\Fine Tuning\Z Scans\Run 068\
INPUT-FILE-NAME =x+00000-y+000-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =1
GAMMA =7827.79
NOM-LAMBDA-U =0.032
NOM-K-VALUE =3.0531
NOM-LAMBDA-R =1.4781e-09
NUM-POLES =210
NUM-END-POLES =6
CELL-LENGTH =4.4

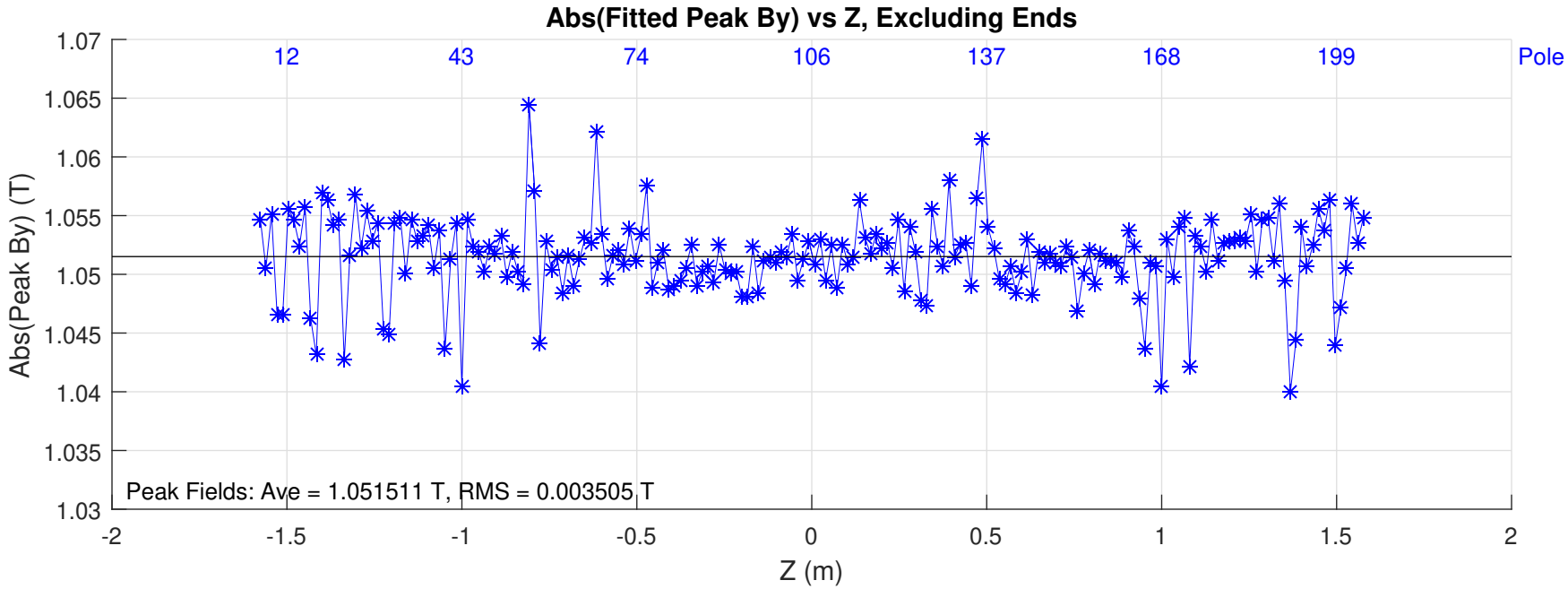

Bx Field Correction vs Zm
10^-5
7.0000000000006
7.0000000000004
7.0000000000002
7
6.9999999999998
6.9999999999996
6.9999999999994
Bx Corr (T)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
By Field Correction vs Zm
10^-5
-0.999999999994
-0.999999999996
-0.999999999998
-1
-1.000000000002
-1.000000000004
-1.000000000006
-1.000000000008
By Corr (T)
Zm Measurement Position (m)

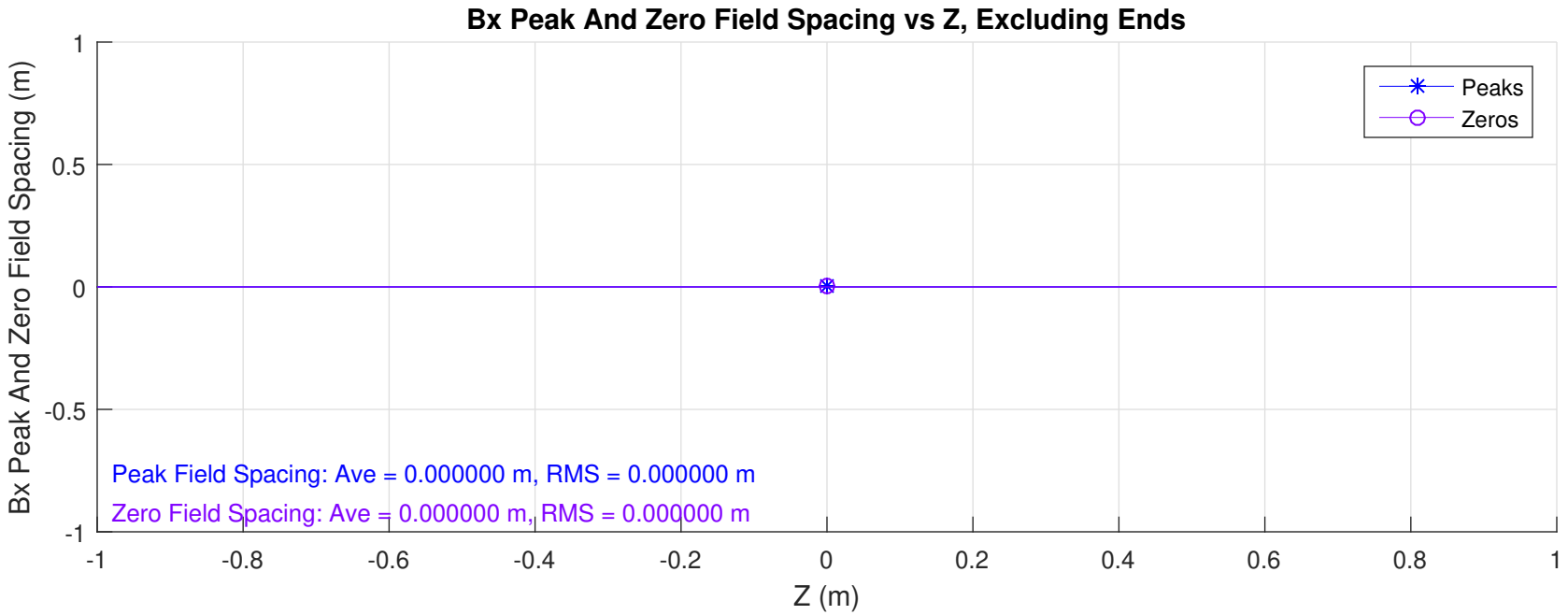

Bx, By vs Zm
10^-3
Bx (T)
By (T)
Zm Measurement Position (m)

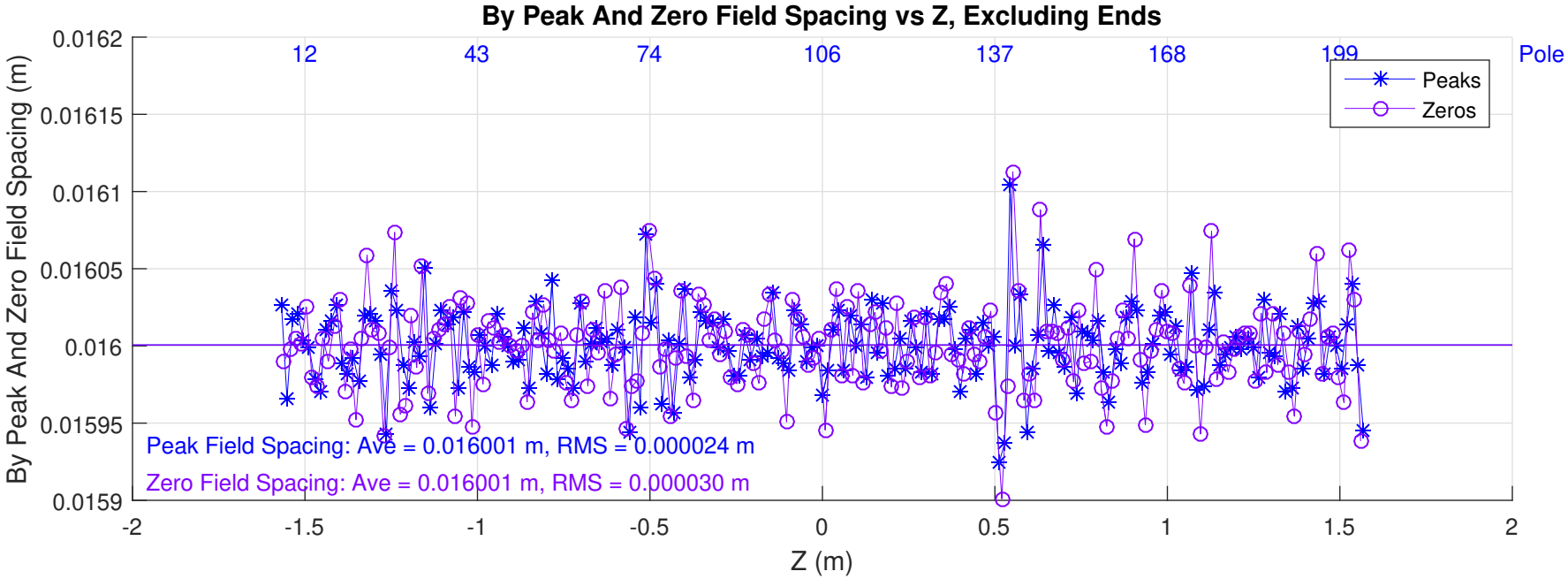

Bx vs Z With Fitted Peaks And Zeros
10^-3
Bx (T)
Z (m)

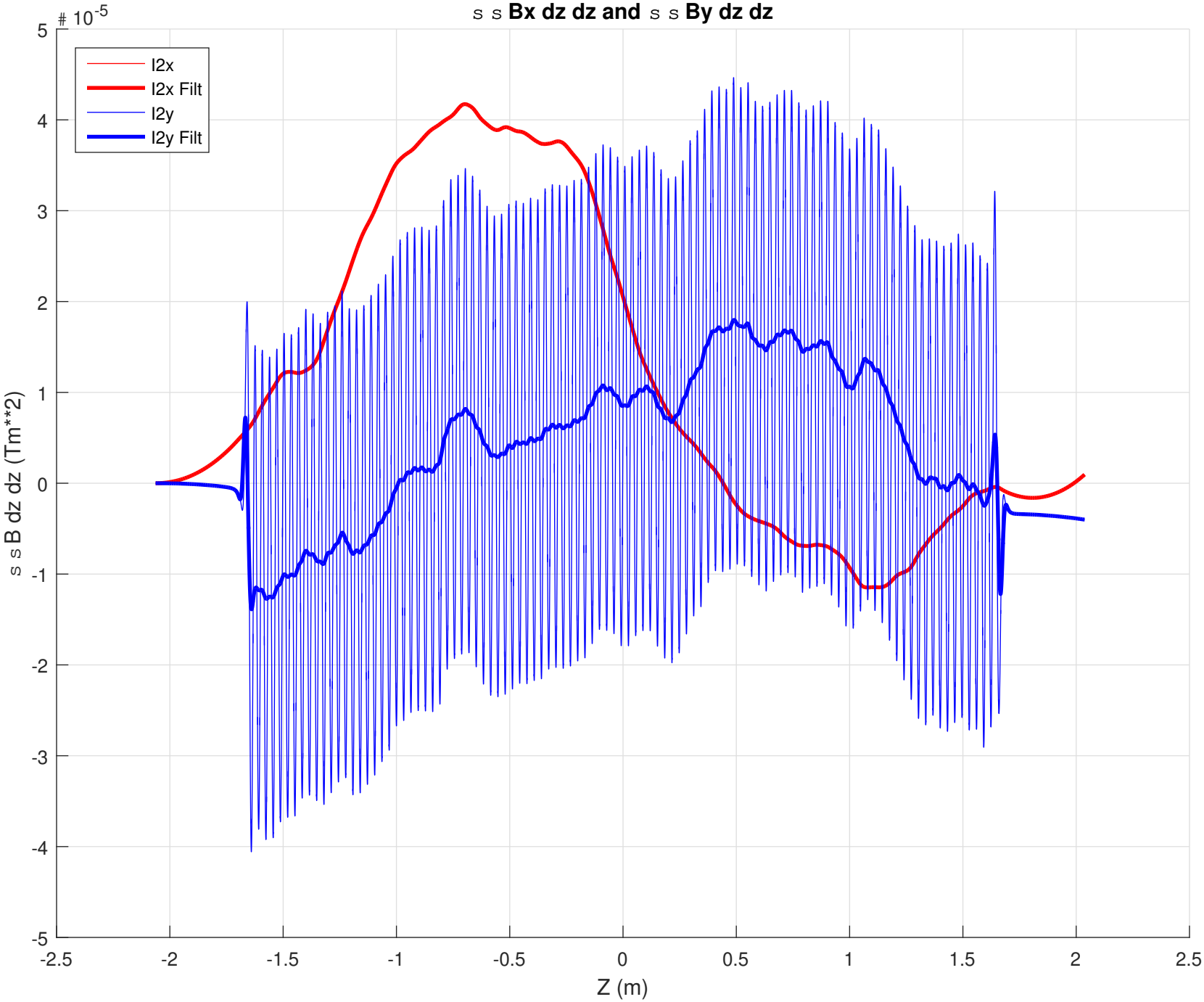

By vs Z With Fitted Peaks And Zeros
12
43
74
106
137
168
199
Pole
By (T)
Z (m)

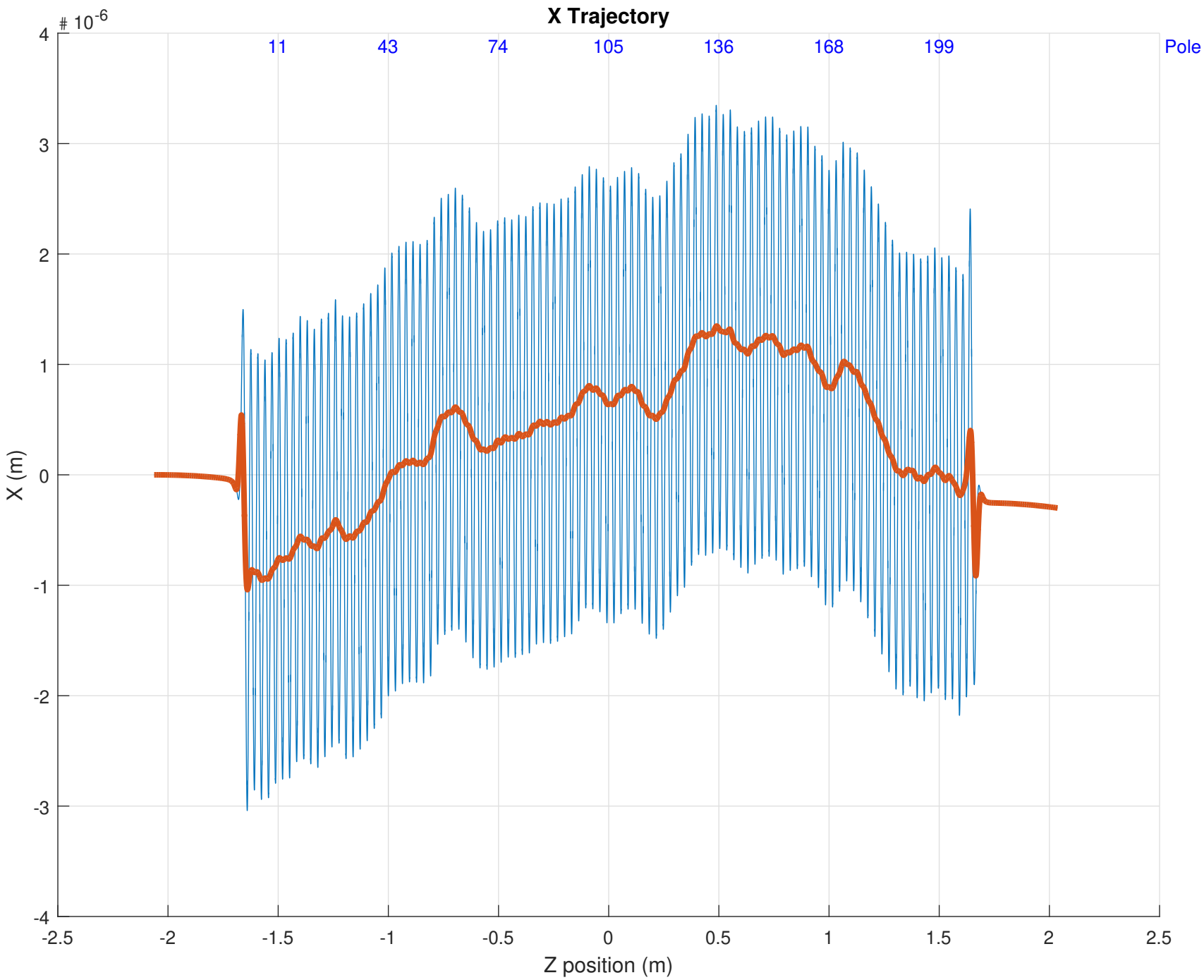

Abs(Fitted Peak Bx) vs Z, Excluding Ends
Abs(Peak Bx) (T)
Z (m)
Peak Fields: Ave = 0.000000 T, RMS = 0.000000 T
1
0.5
0
-0.5
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1

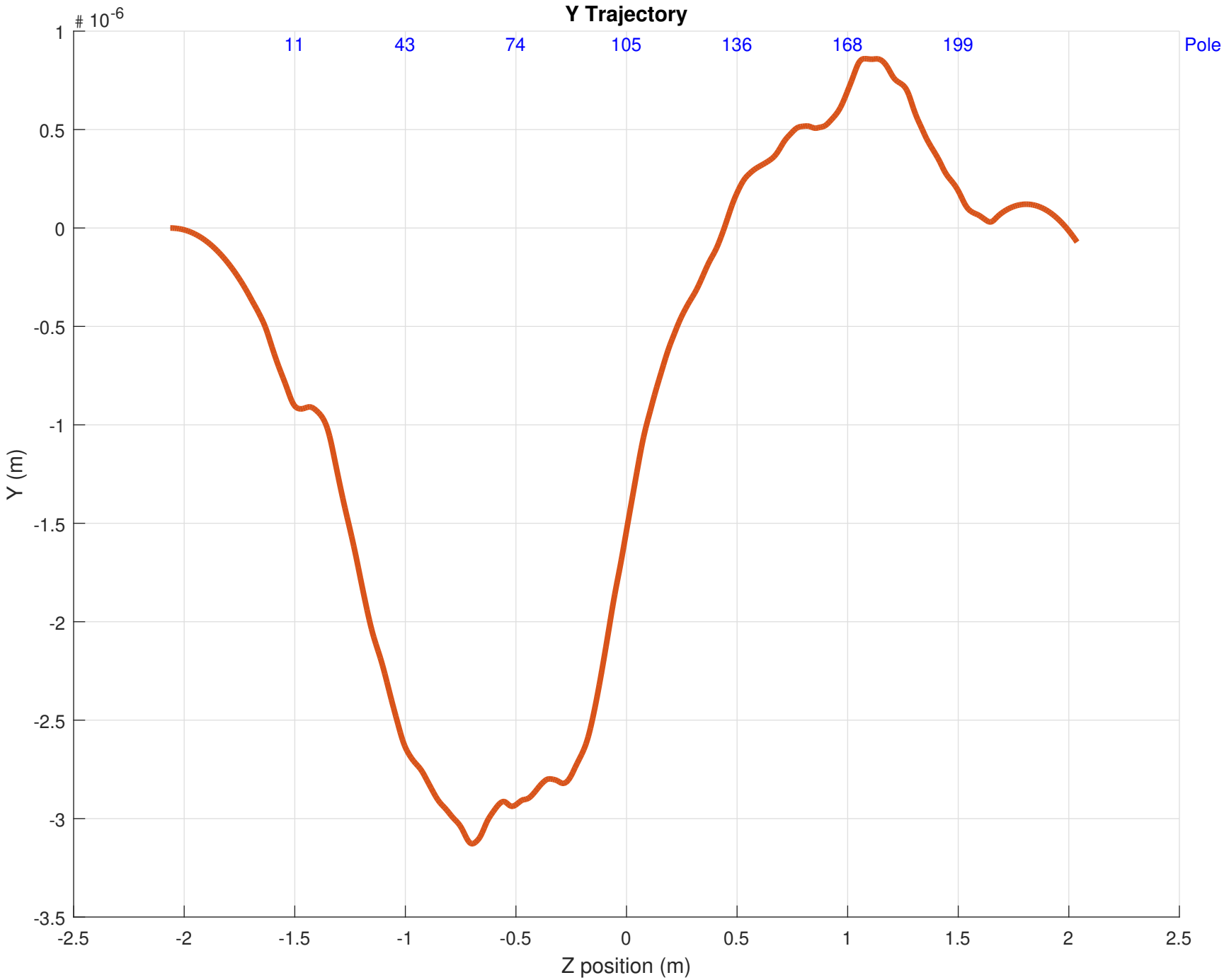

Abs(Fitted Peak By) vs Z, Excluding Ends
Abs(Peak By) (T)
Z (m)
Peak Fields: Ave = 1.051511 T, RMS = 0.003505 T
12
43
74
106
137
168
199
Pole
1.07
1.065
1.06
1.055
1.05
1.045
1.04
1.035
1.03
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

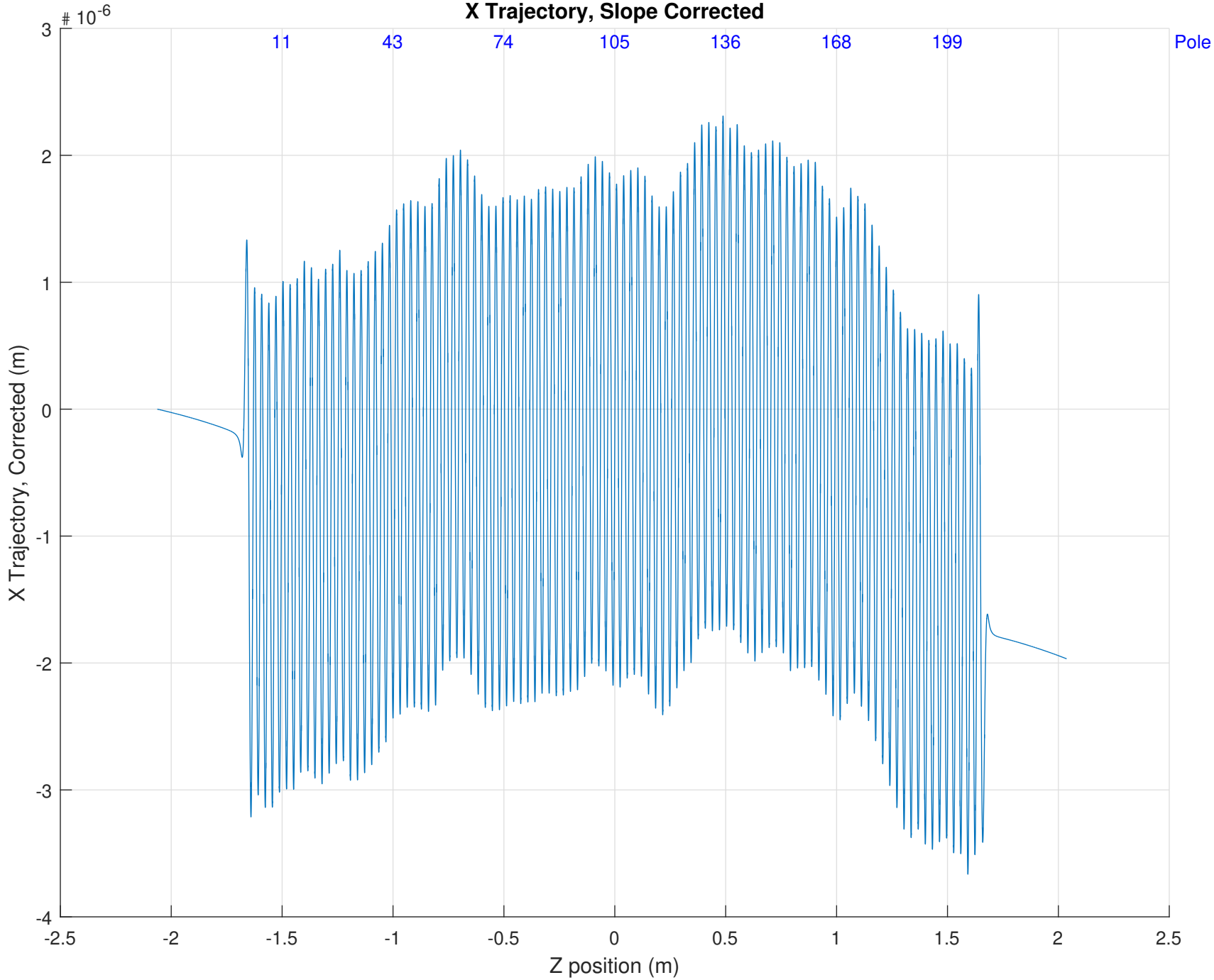

Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
Z (m)
Peaks
Zeros
Peak Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
Zero Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m

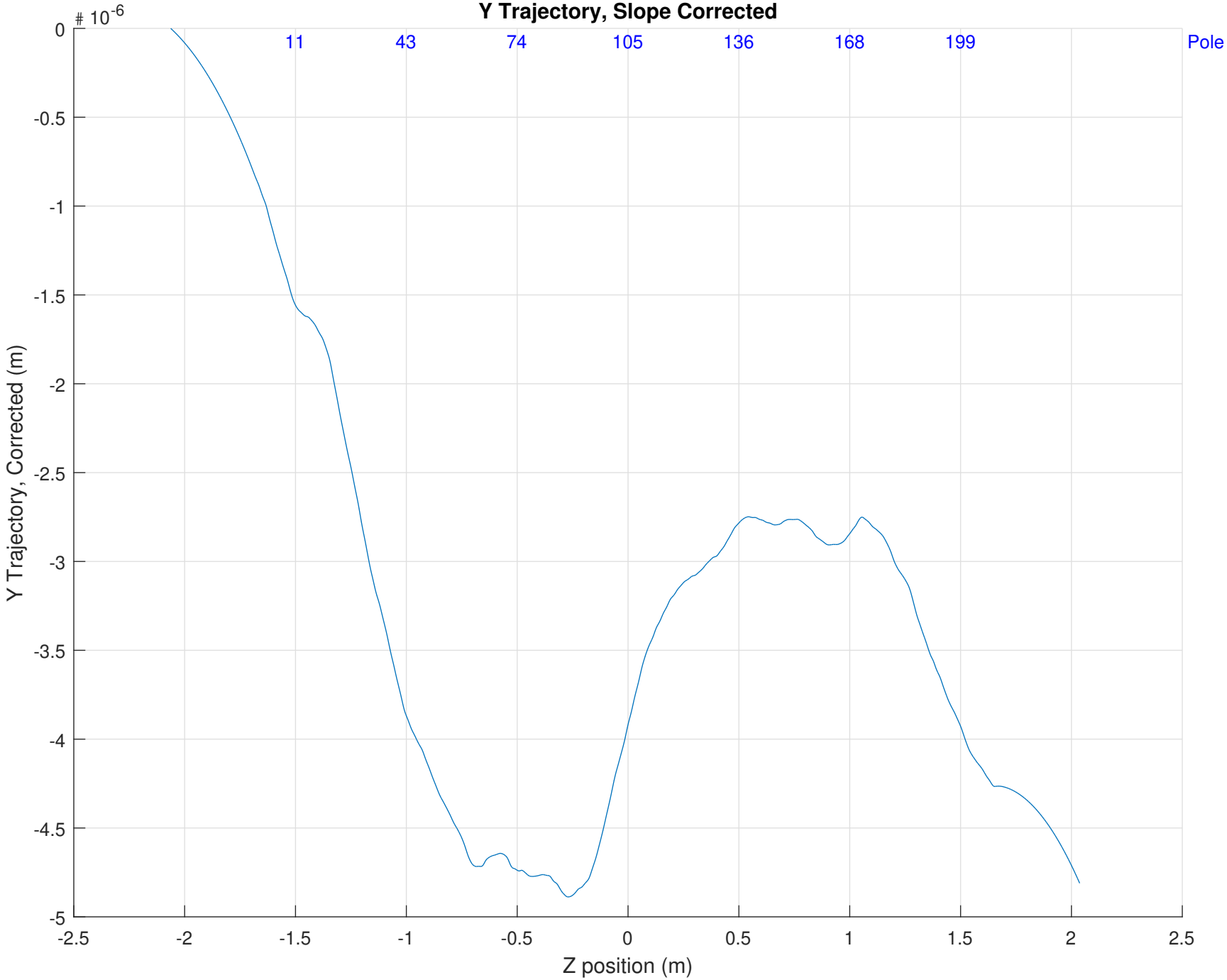

By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
Z (m)
12
43
74
106
137
168
199
Pole
Peaks
Zeros
Peak Field Spacing: Ave = 0.016001 m, RMS = 0.000024 m
Zero Field Spacing: Ave = 0.016001 m, RMS = 0.000030 m

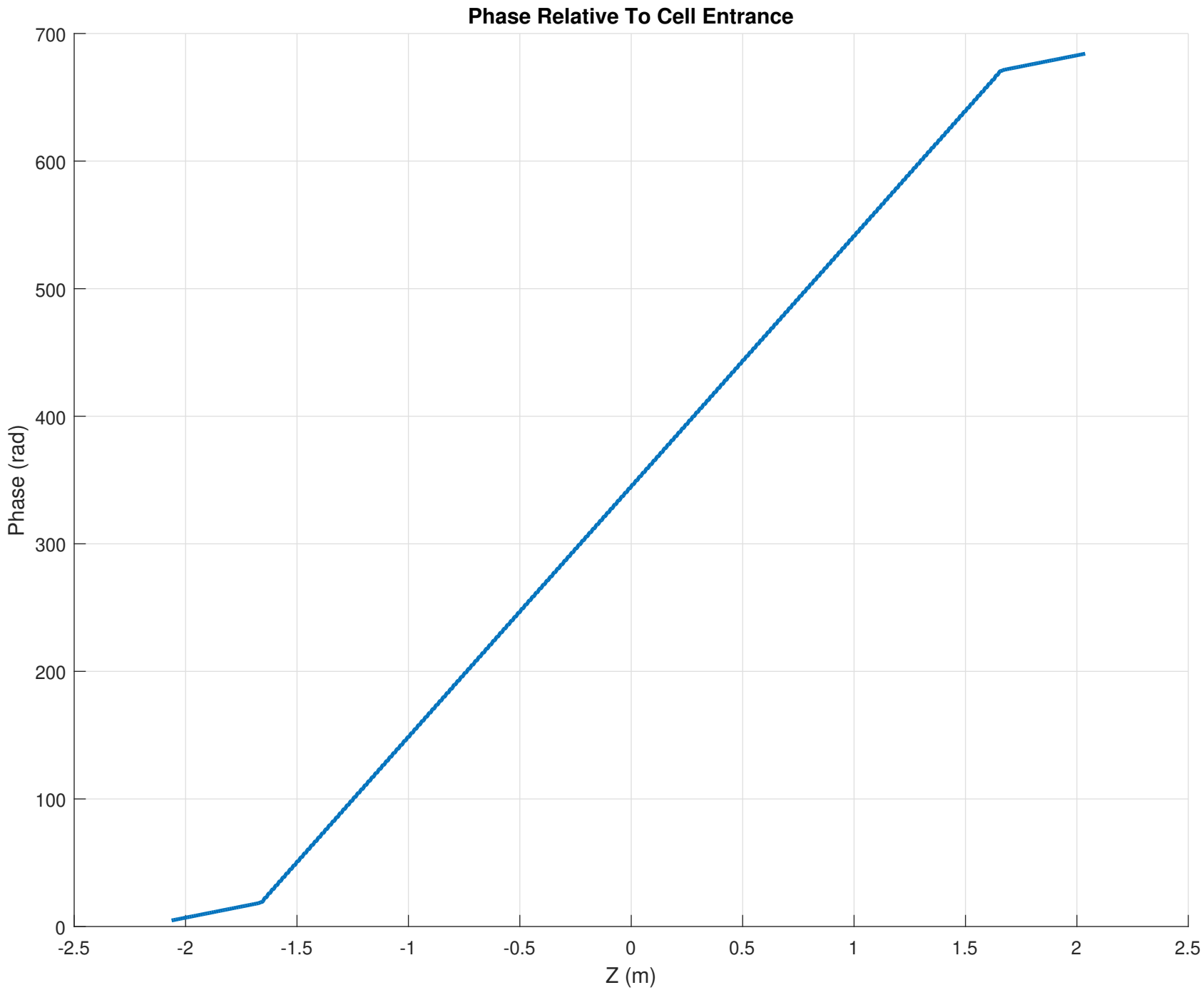

∫∫Bx dz dz and ∫∫By dz dz
10^-5
I2x
I2x Filt
I2y
I2y Filt
∫∫B dz dz (Tm**2)
Z (m)
5
4
3
2
1
0
-1
-2
-3
-4
-5
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

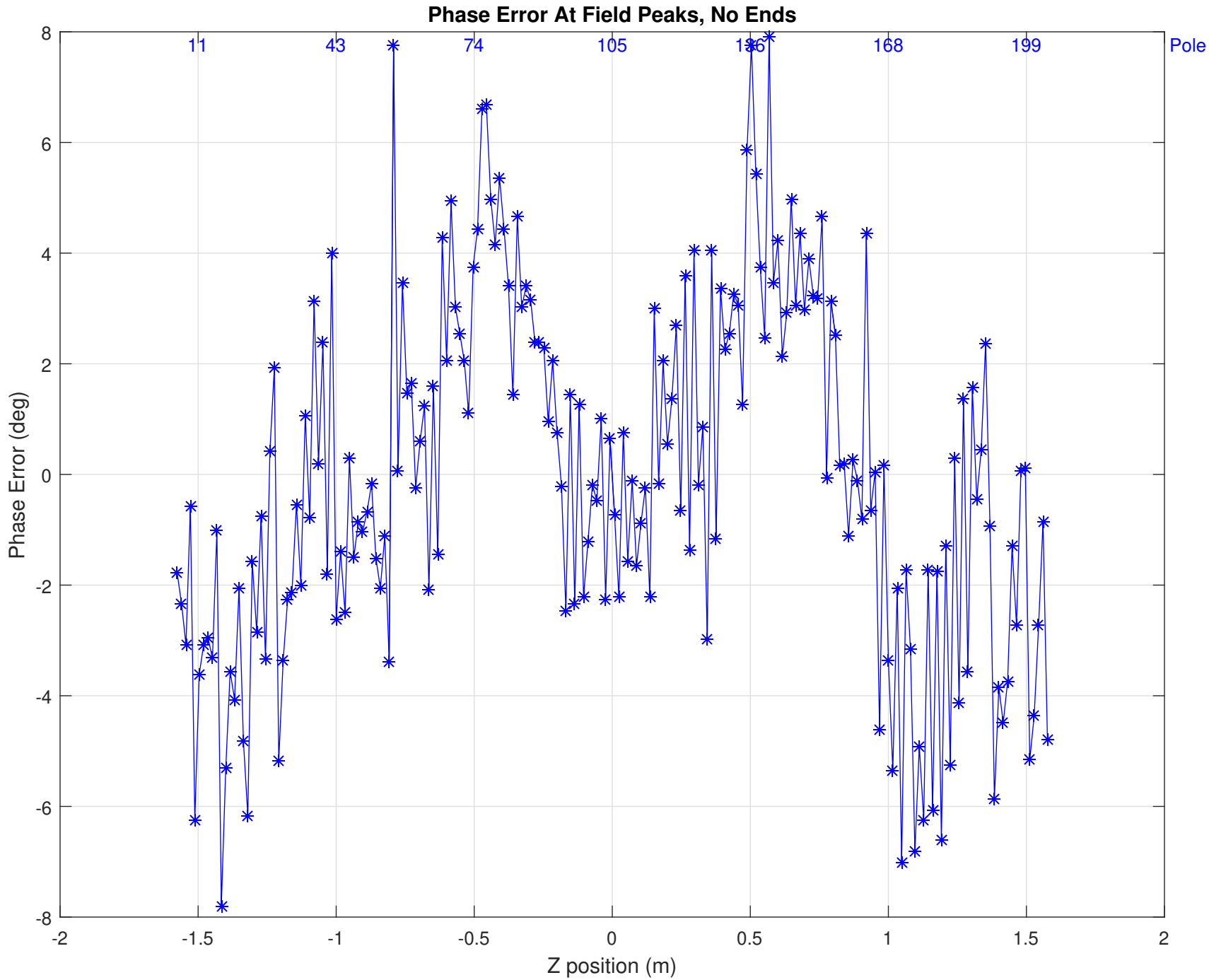

X Trajectory
10^-6
11
43
74
105
136
168
199
Pole
4
3
2
1
0
-1
-2
-3
-4
X (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


Y Trajectory
10^-6
11
43
74
105
136
168
199
Pole
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
Y (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

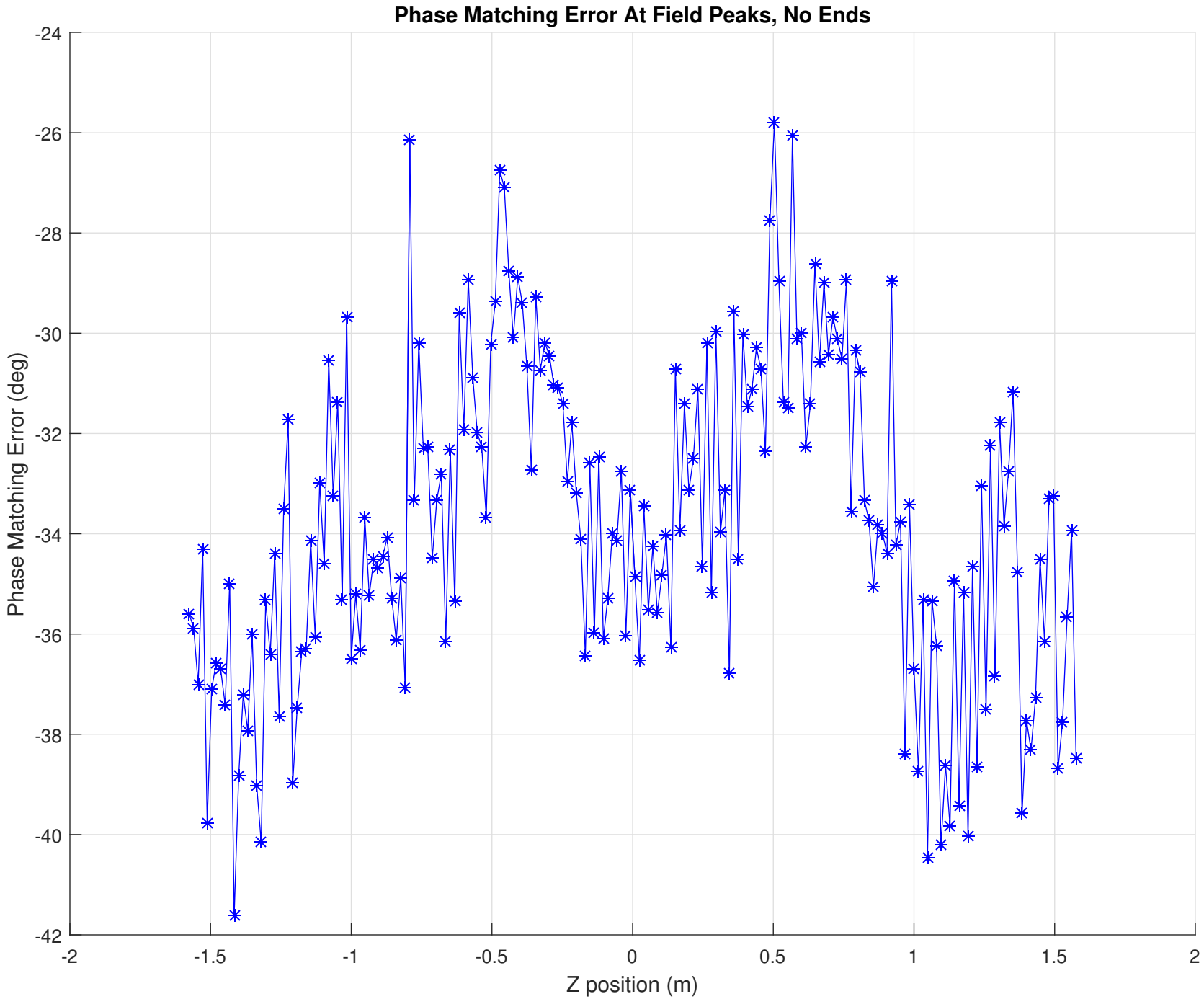

X Trajectory, Slope Corrected
10^-6
11
43
74
105
136
168
199
Pole
3
2
1
0
-1
-2
-3
-4
X Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


Y Trajectory, Slope Corrected
10^-6
11
43
74
105
136
168
199
Pole
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
Y Trajectory, Corrected (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

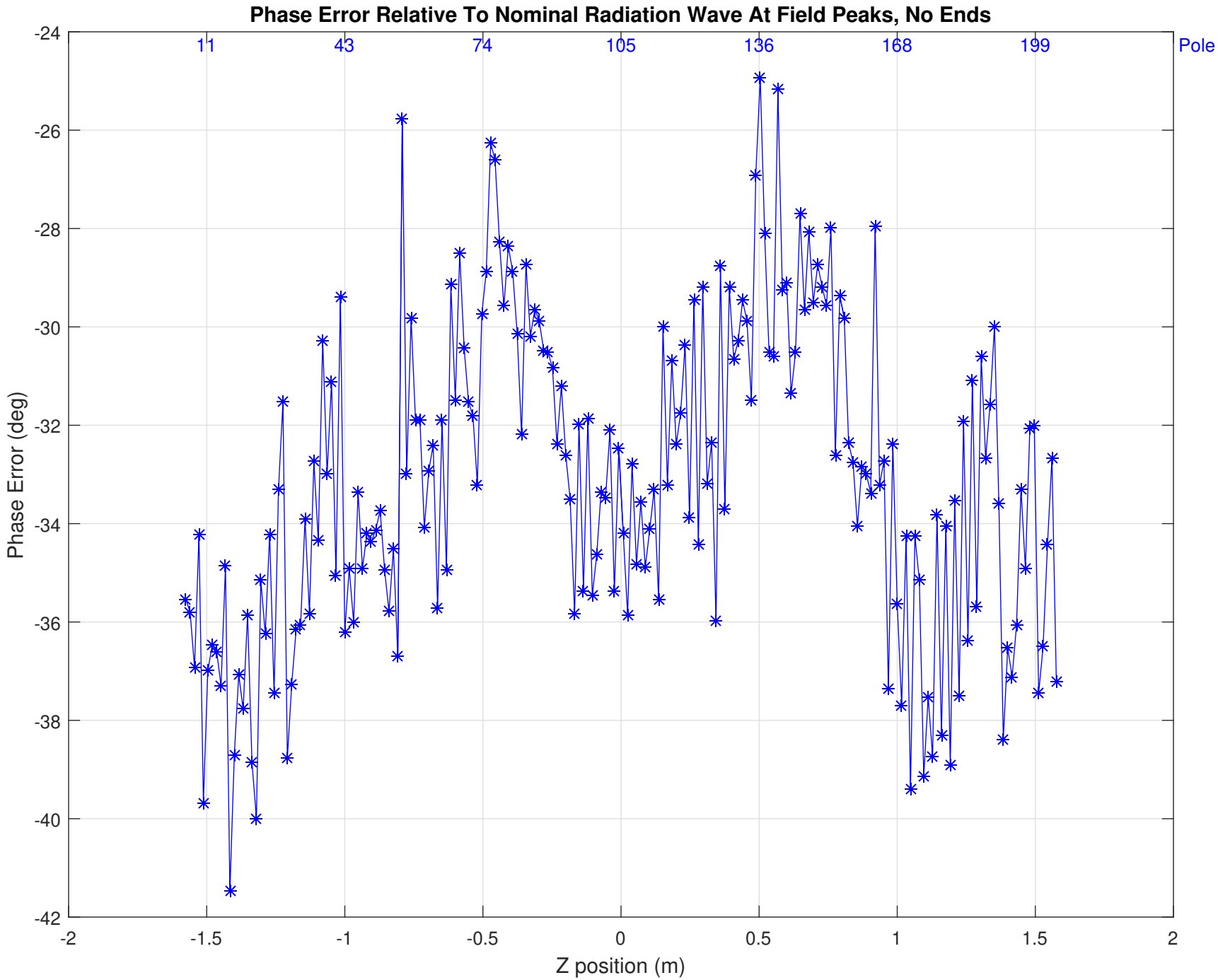

Phase Relative To Cell Entrance
Phase (rad)
Z (m)
700
600
500
400
300
200
100
0
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5



Phase Error: Ave = 0.000000 deg, RMS = 3.214479 deg



Phase Match Error: Ave = -33.751676 deg, RMS = 3.180202 deg


Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
11
43
74
105
136
168
199
Pole
-24
-26
-28
-30
-32
-34
-36
-38
-40
-42
Phase Error (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)