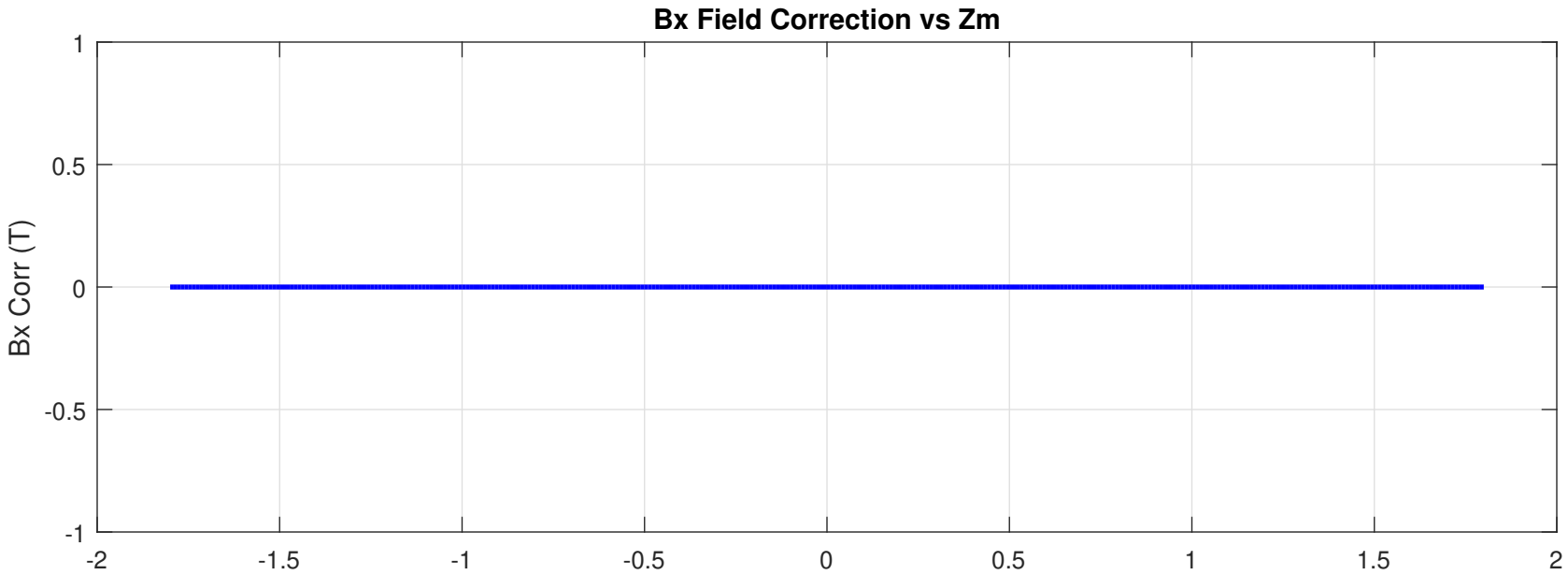
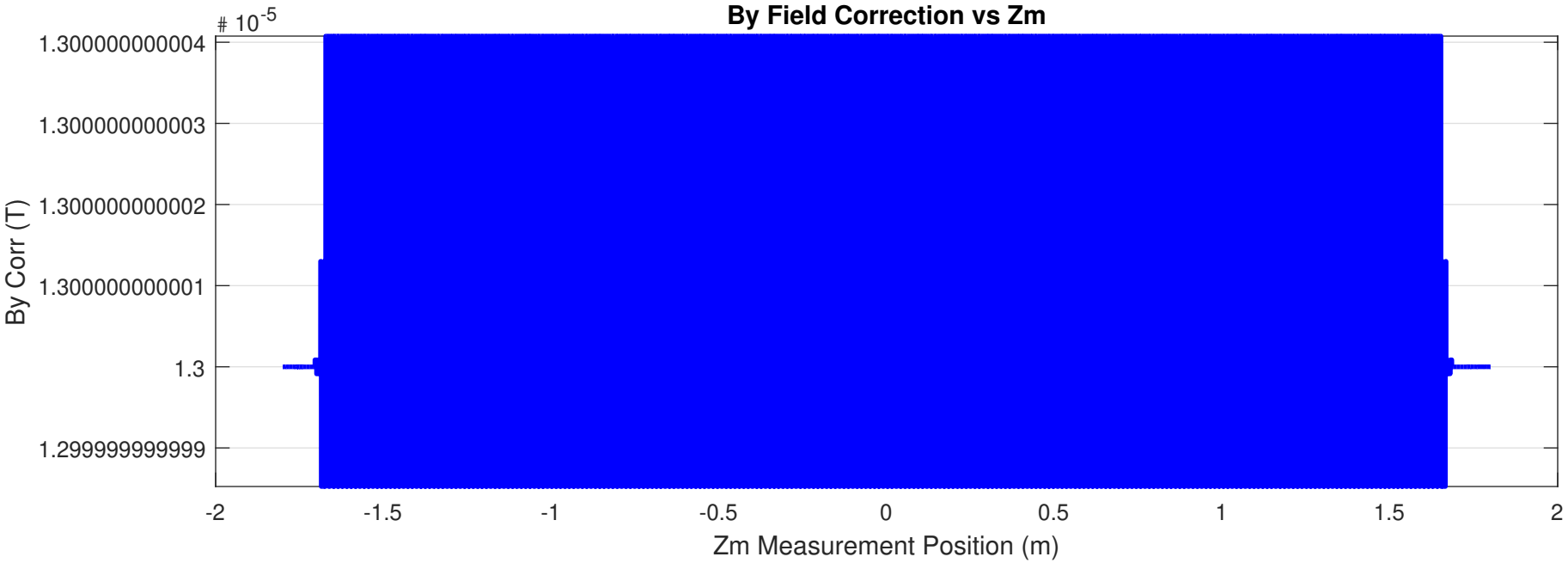
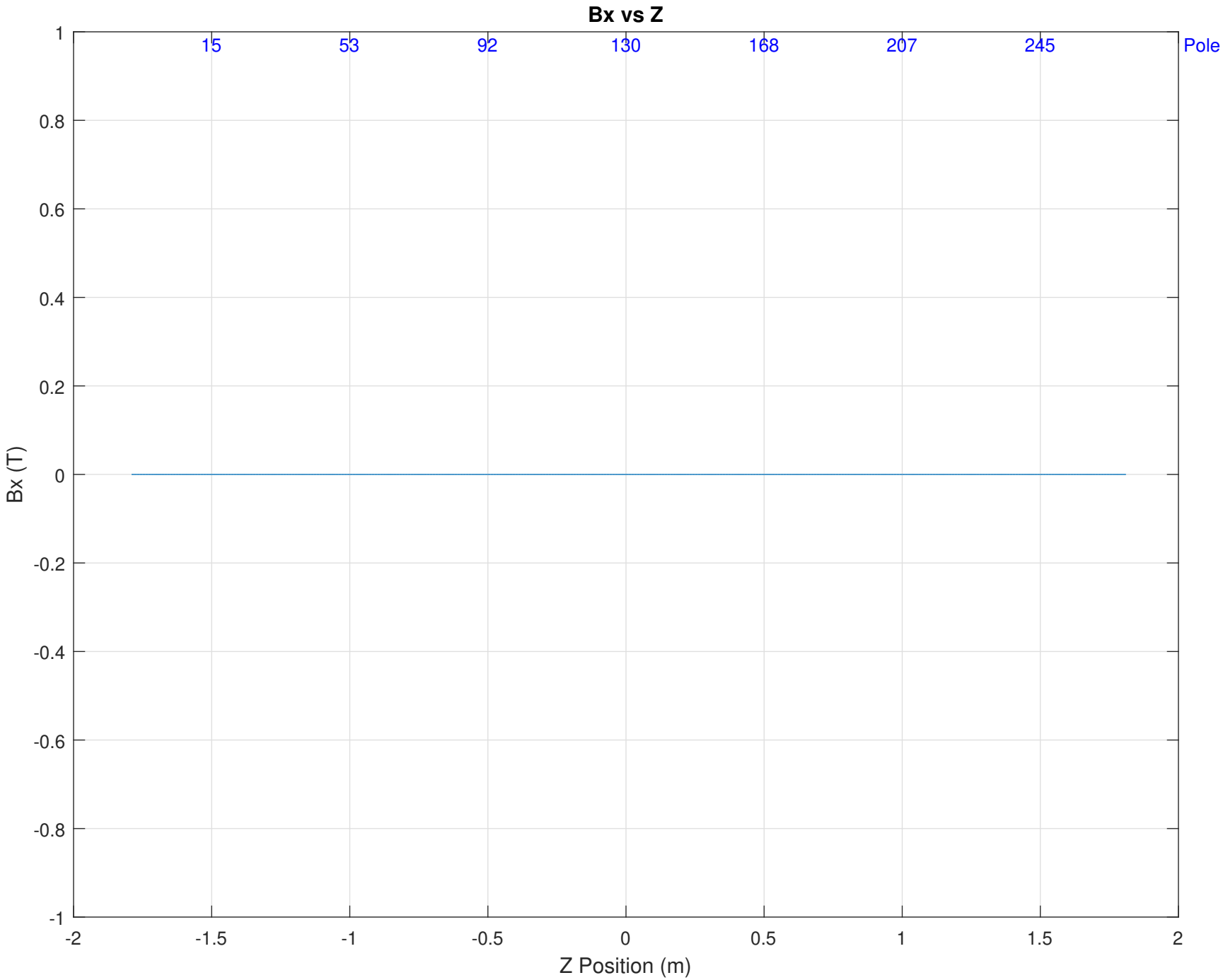
SLAC Magnetic Measurements

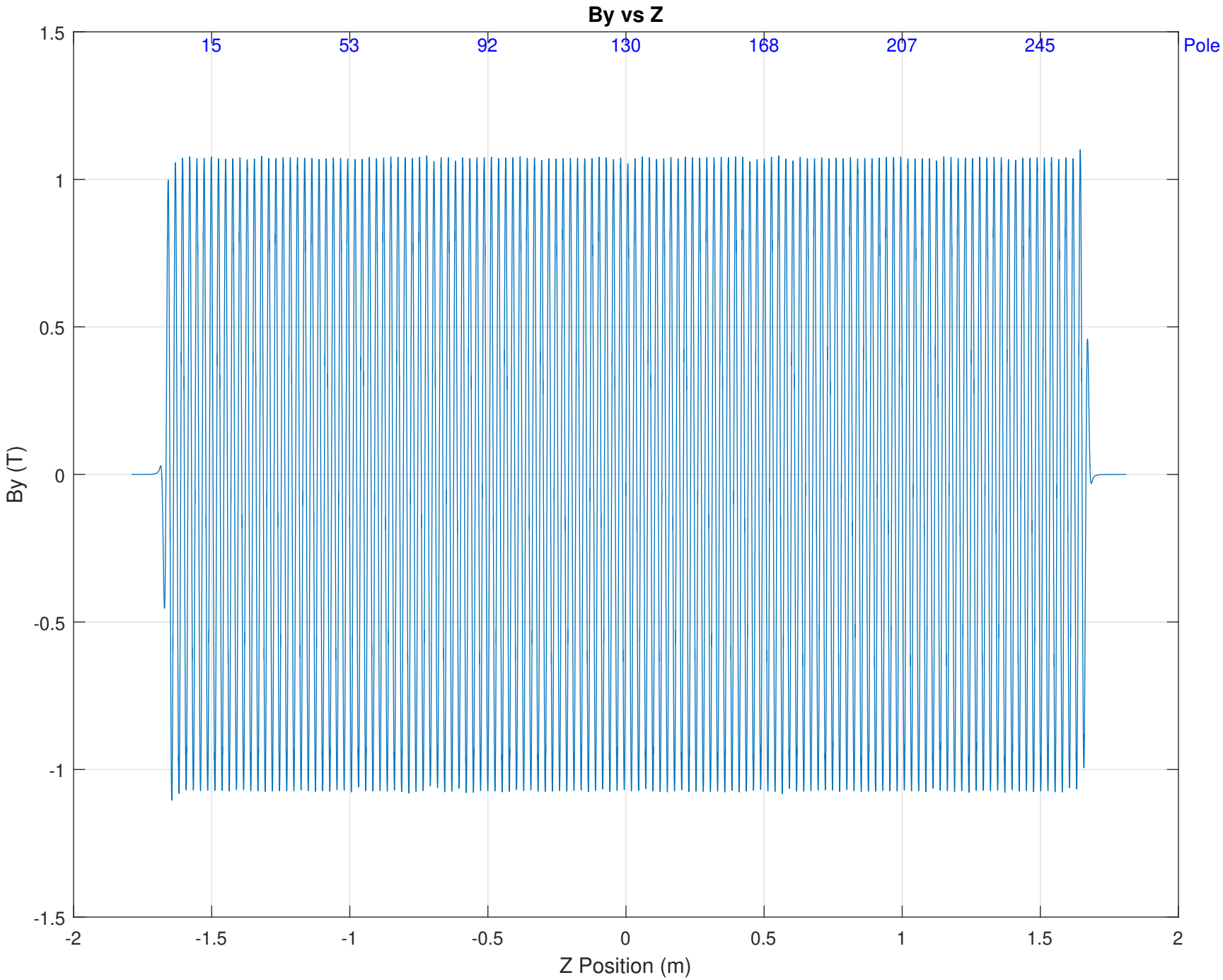
Planar Insertion Device Analysis

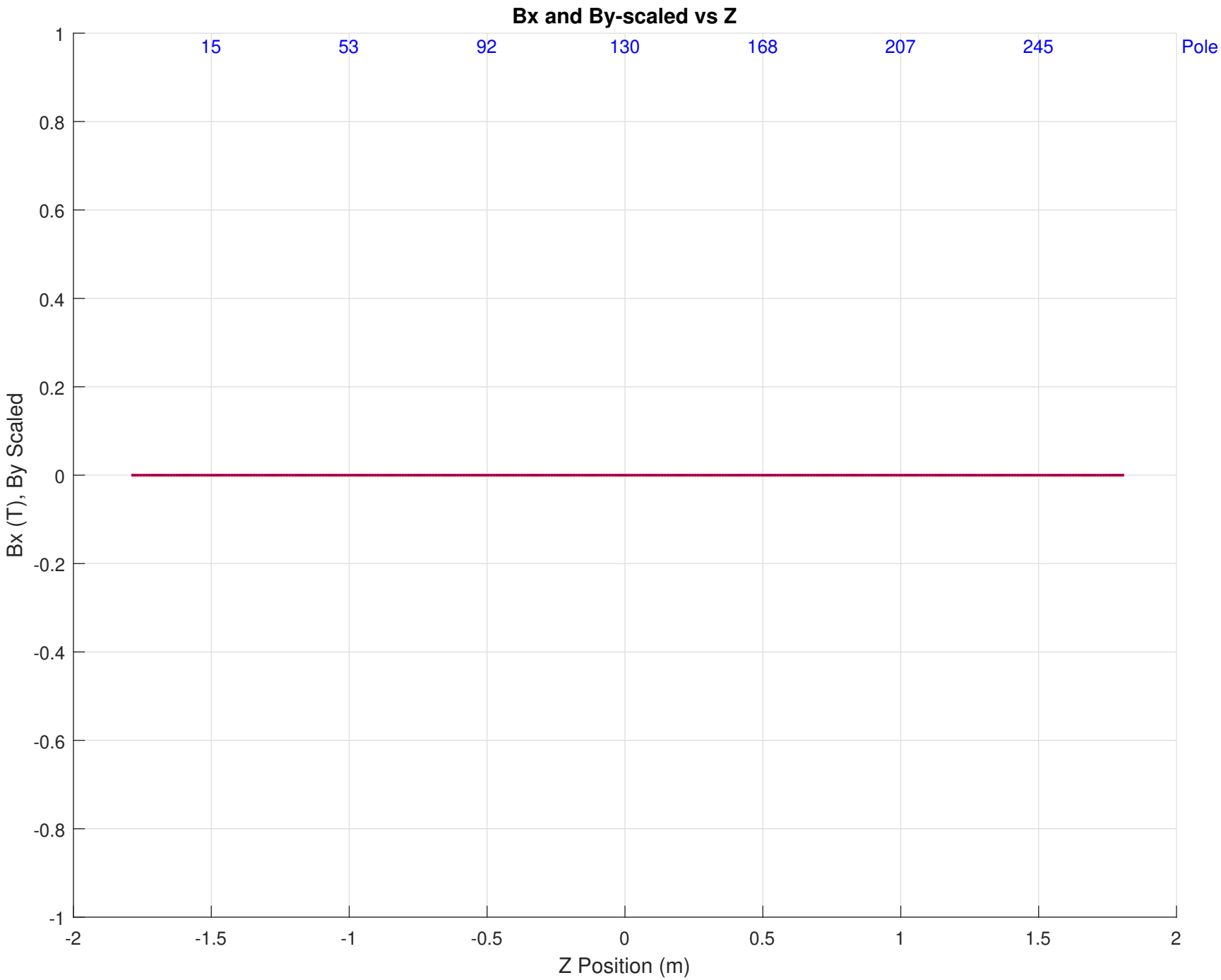
Parameters:
INPUT-FILE-DIR =V:\MET\MagServe\MagData\LCLS-II\Undulator\ANL data\
INPUT-FILE-NAME =BxvsZtaper2.072
INPUT-FILE-TYPE =ZBYH-ANL
CORR-REQUIRED =1
GAMMA =27397
NOM-LAMBDA-U =0.026
NOM-K-VALUE =1.5363
NOM-LAMBDA-R =3.7759e-11
NUM-POLES =260
NUM-END-POLES =4
CELL-LENGTH =3.656

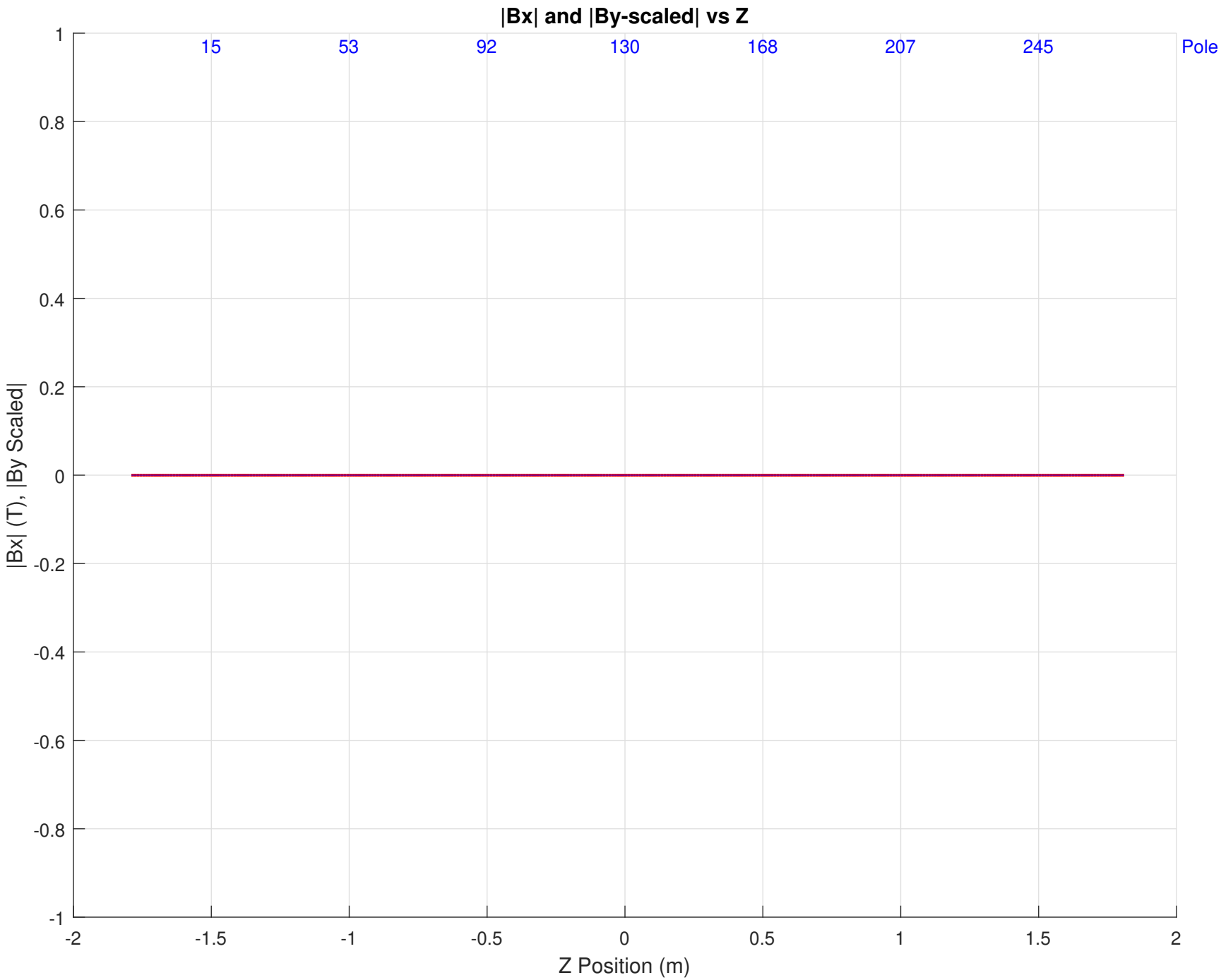

Bx Field Correction vs Zm
Bx Corr (T)
1
0.5
0
-0.5
-1
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

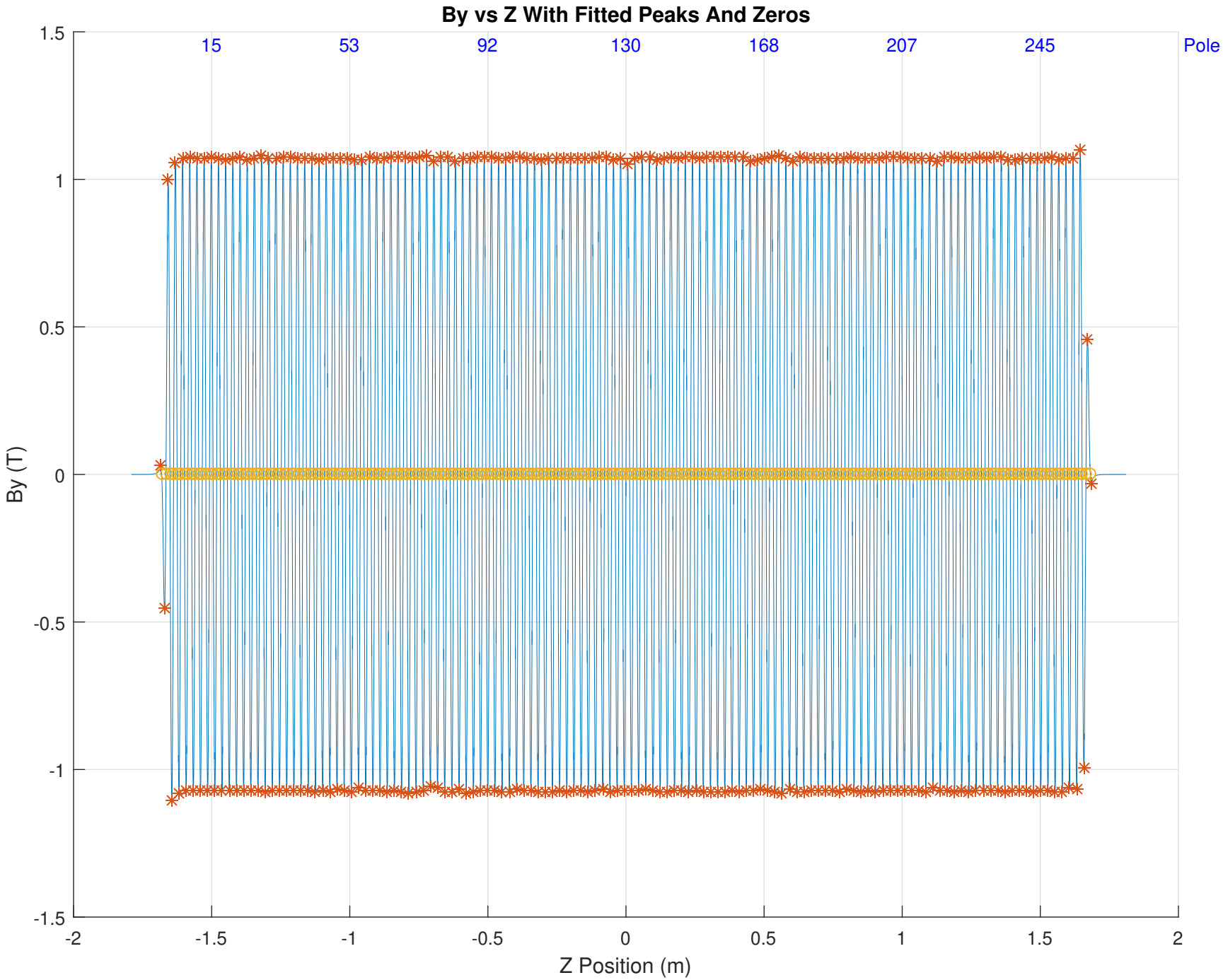

By Field Correction vs Zm
10^-5
1.300000000004
1.300000000003
1.300000000002
1.300000000001
1.3
1.299999999999
By Corr (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Zm Measurement Position (m)

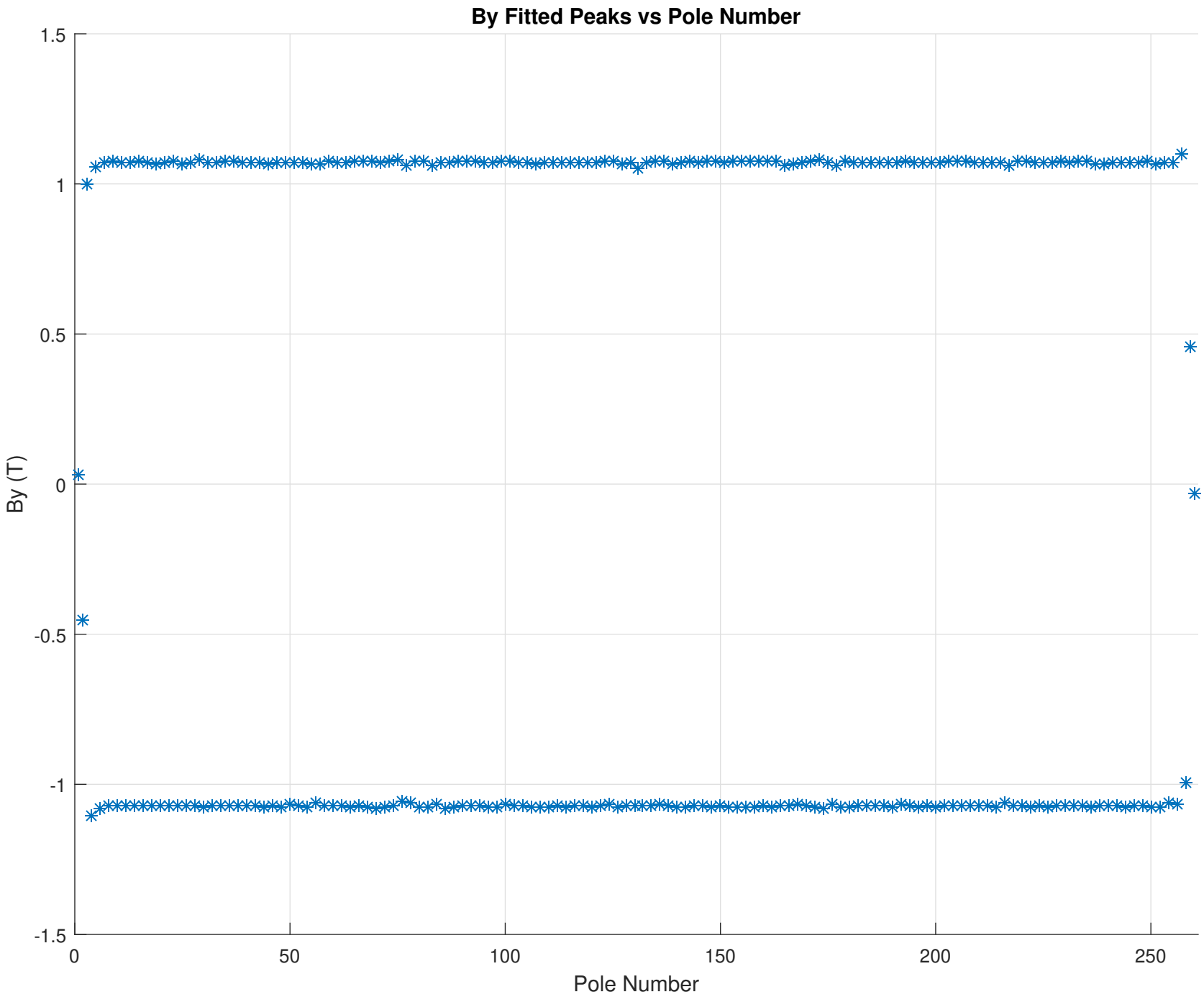

Bx vs Z
15
53
92
130
168
207
245
Pole
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
Bx (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

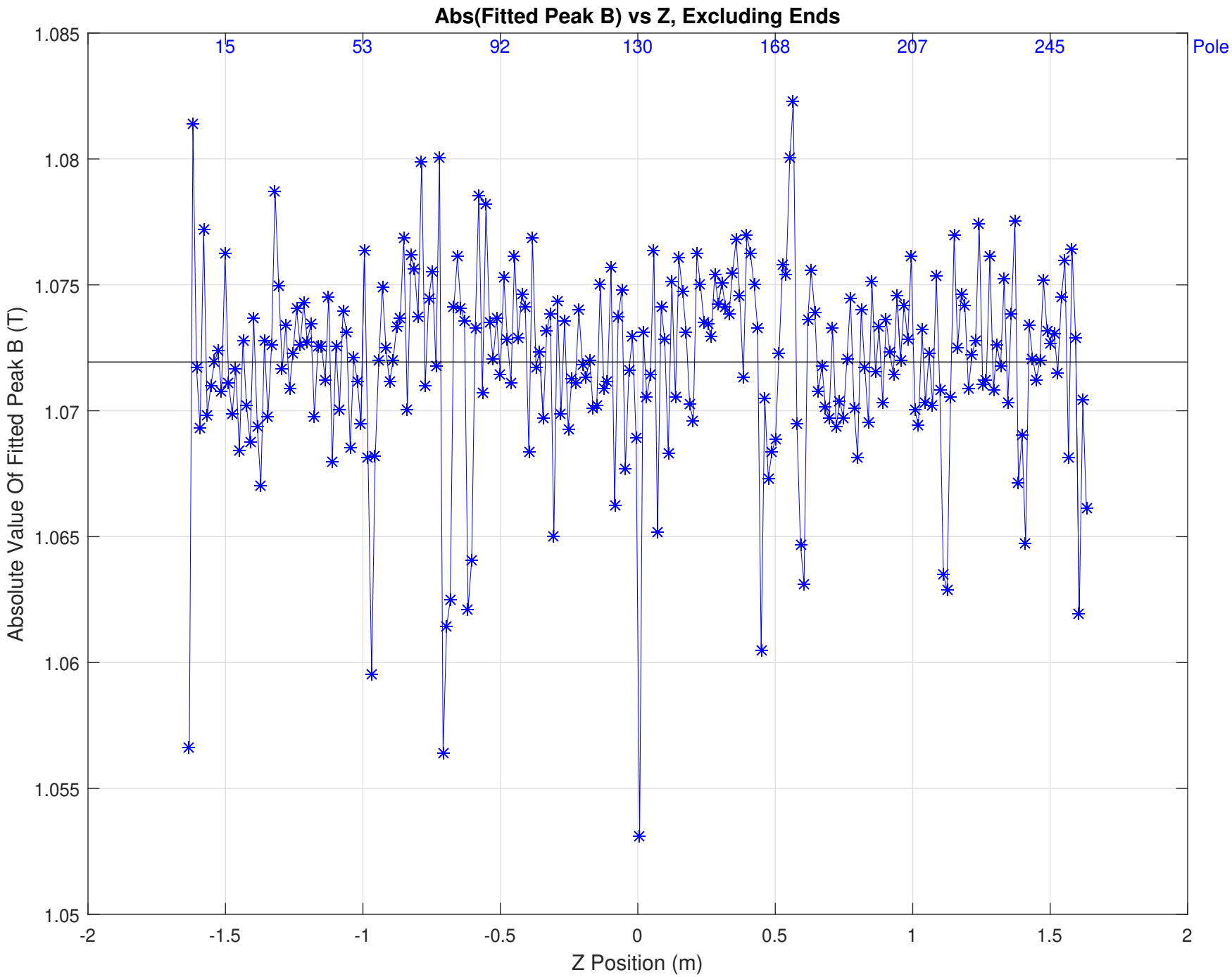

By vs Z
15
53
92
130
168
207
245
Pole
1.5
1
0.5
0
-0.5
-1
-1.5
By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)


Bx and By-scaled vs Z
15
53
92
130
168
207
245
Pole
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
Bx (T), By Scaled
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

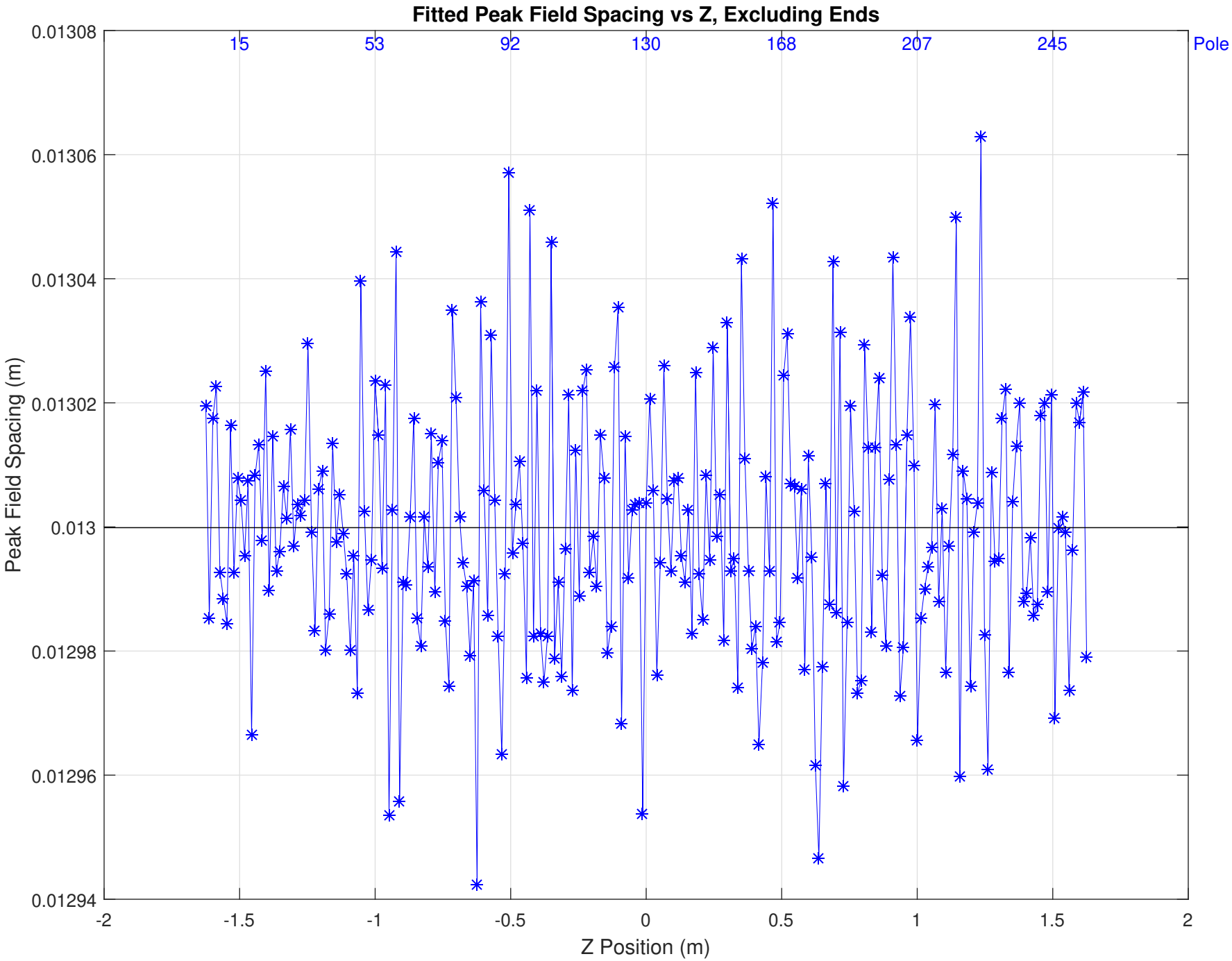

|Bx| and |By-scaled| vs Z
15
53
92
130
168
207
245
Pole
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
|Bx| (T), |By Scaled|
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)


By vs Z With Fitted Peaks And Zeros
15
53
92
130
168
207
245
Pole
1.5
1
0.5
0
-0.5
-1
-1.5
By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

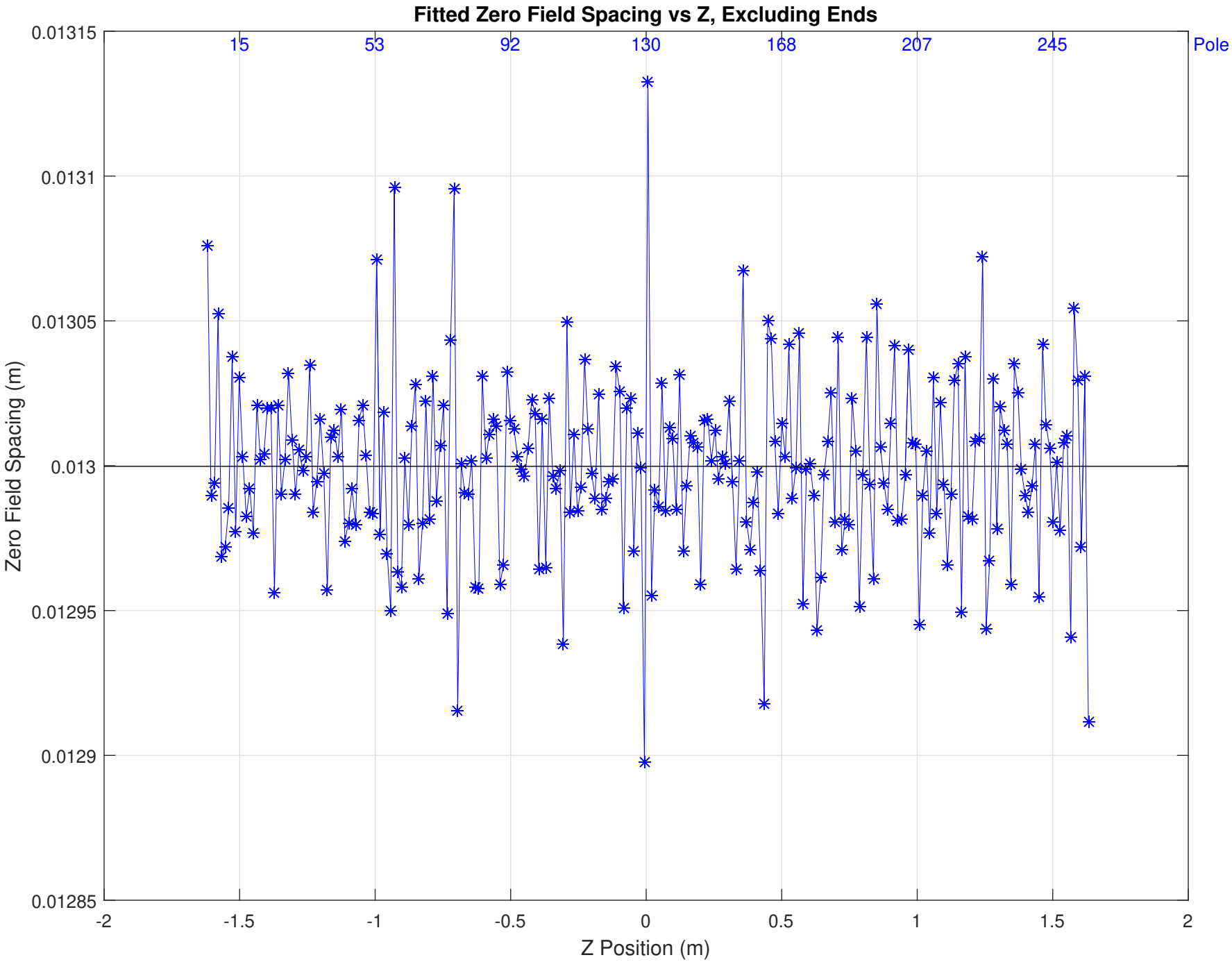

By Fitted Peaks vs Pole Number
1.5
1
0.5
0
-0.5
-1
-1.5
By (T)
0
50
100
150
200
250
Pole Number



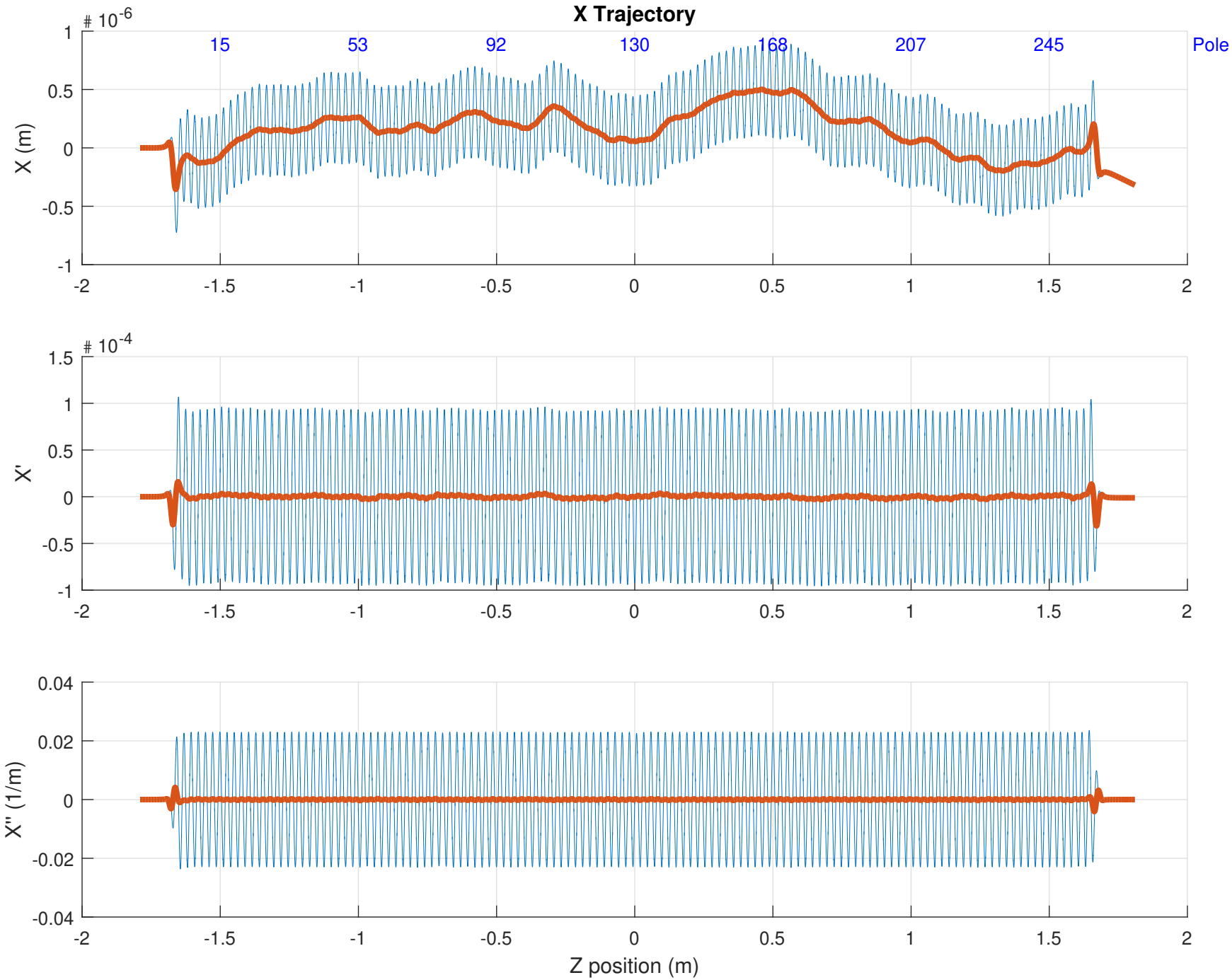
Peak Fields: Ave = 1.071938 T, RMS = 0.003951 T

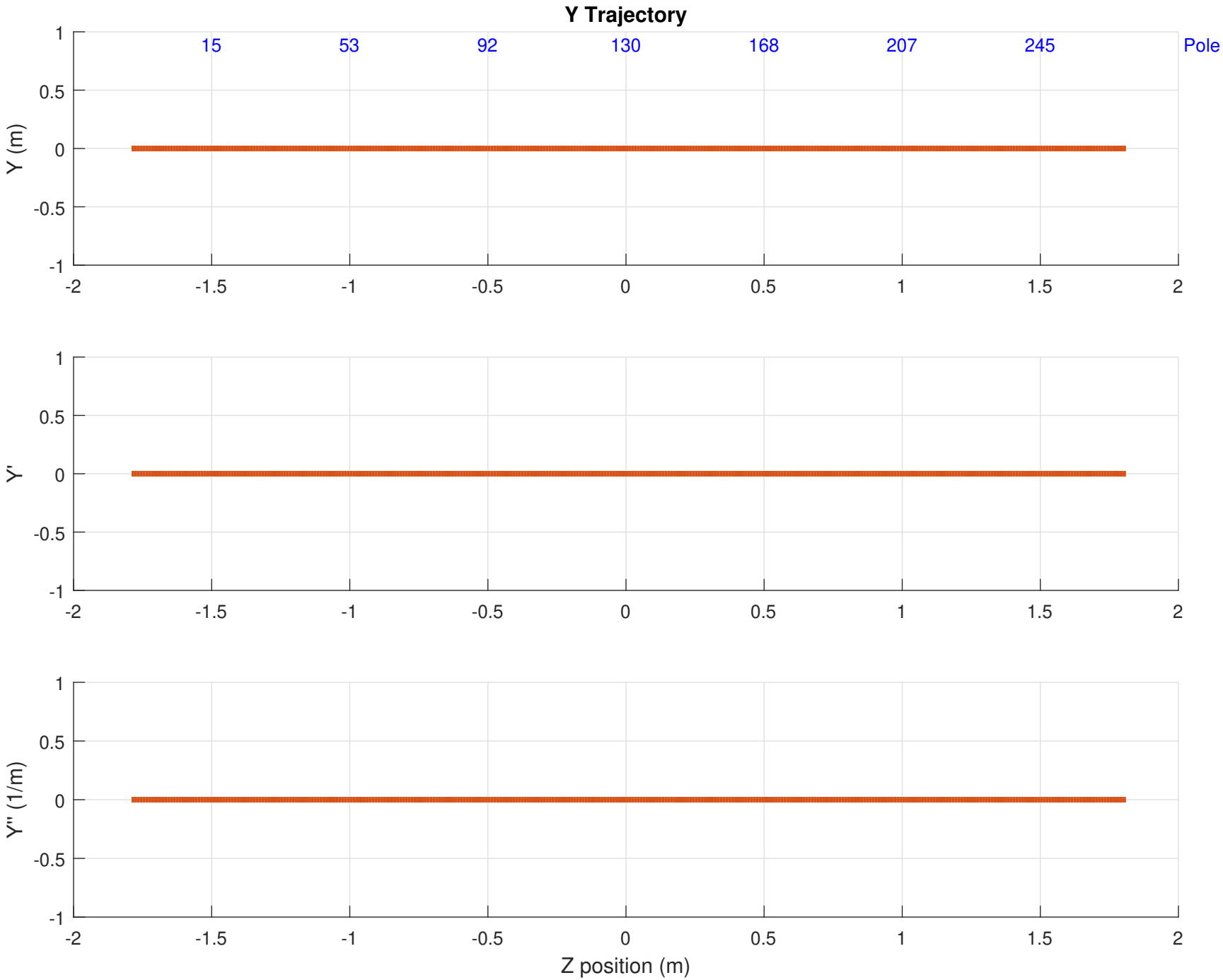


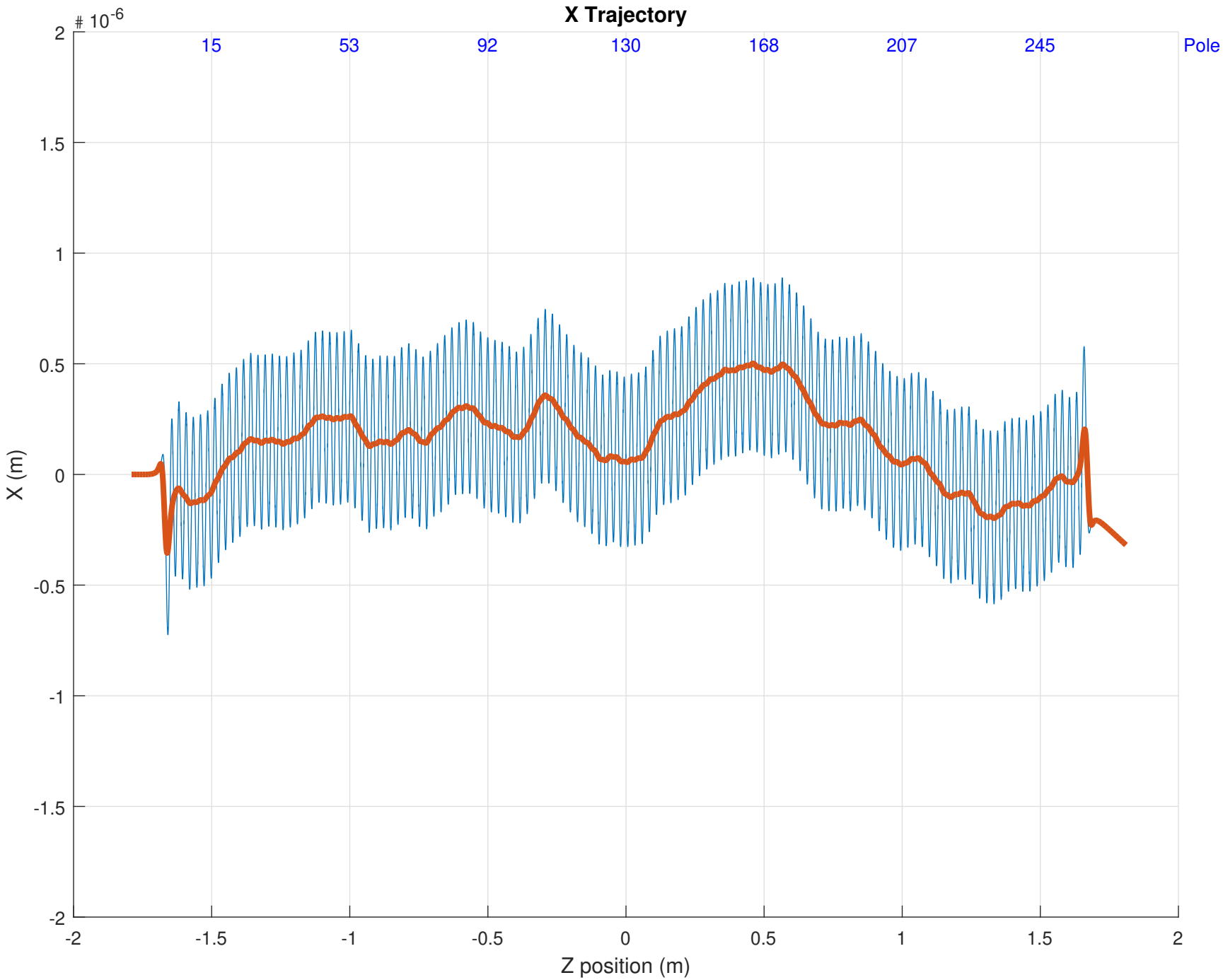
Peak Field Spacing: Ave = 0.013000 m, RMS = 0.000021 m

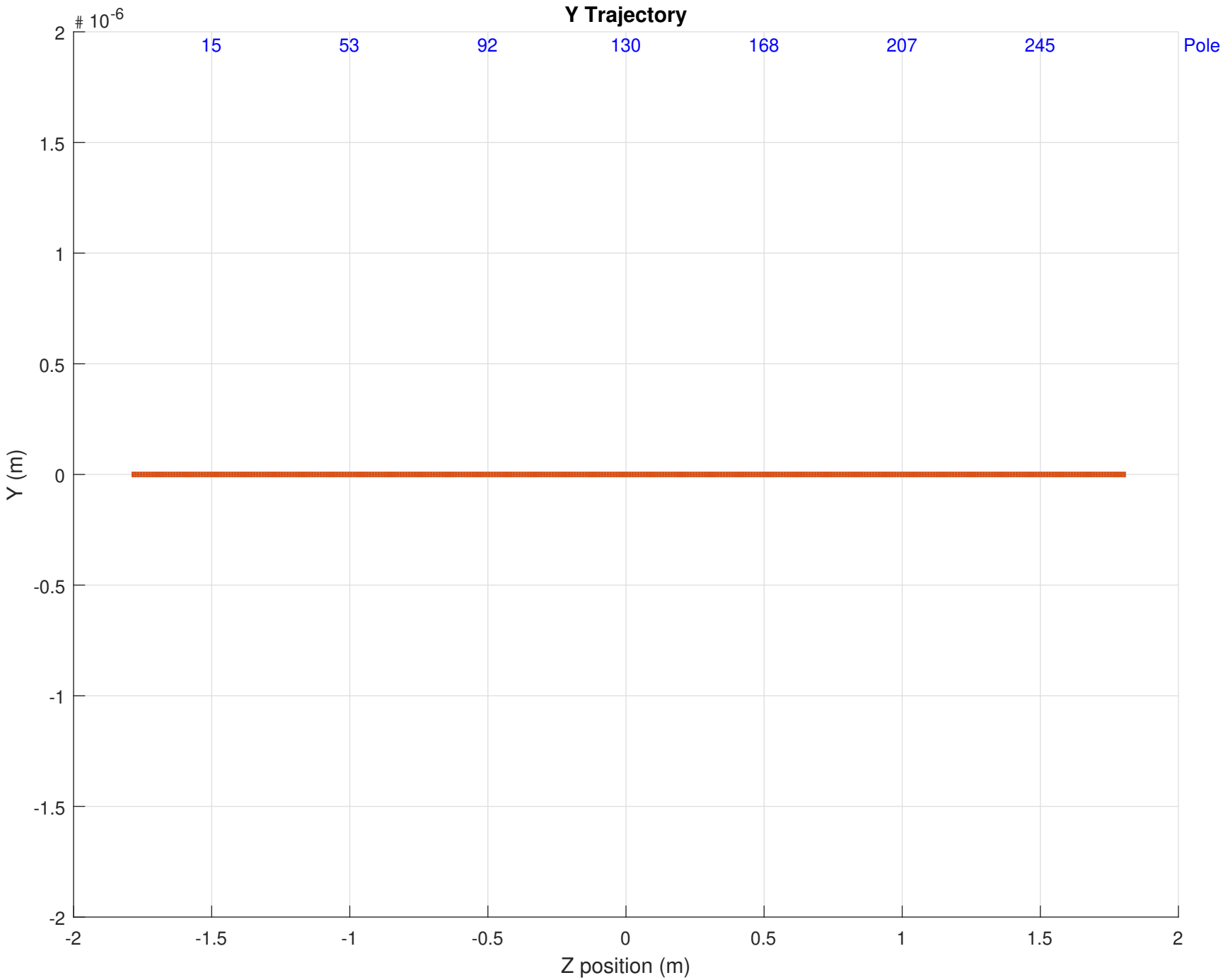


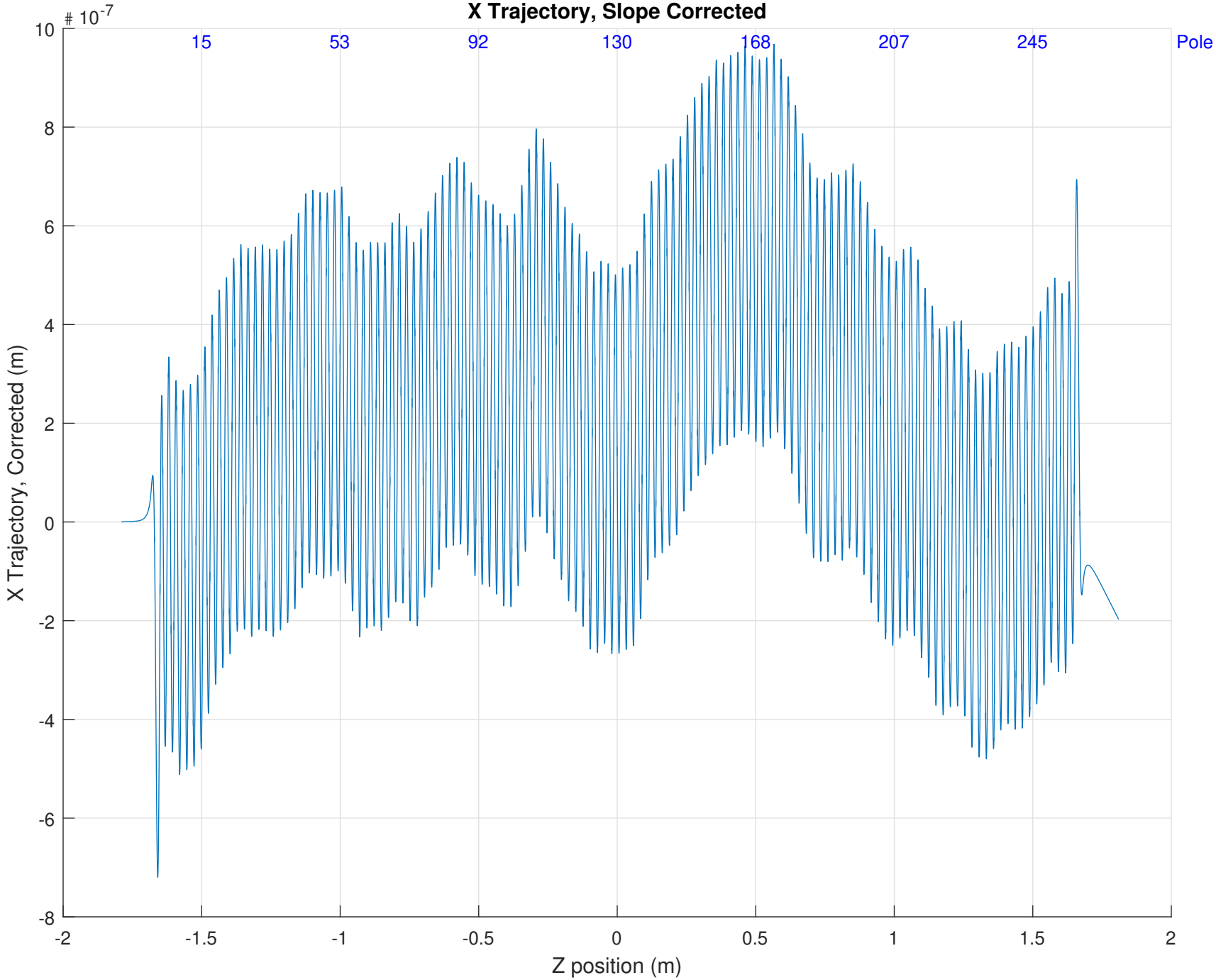
Zero Field Spacing: Ave = 0.013000 m, RMS = 0.000031 m

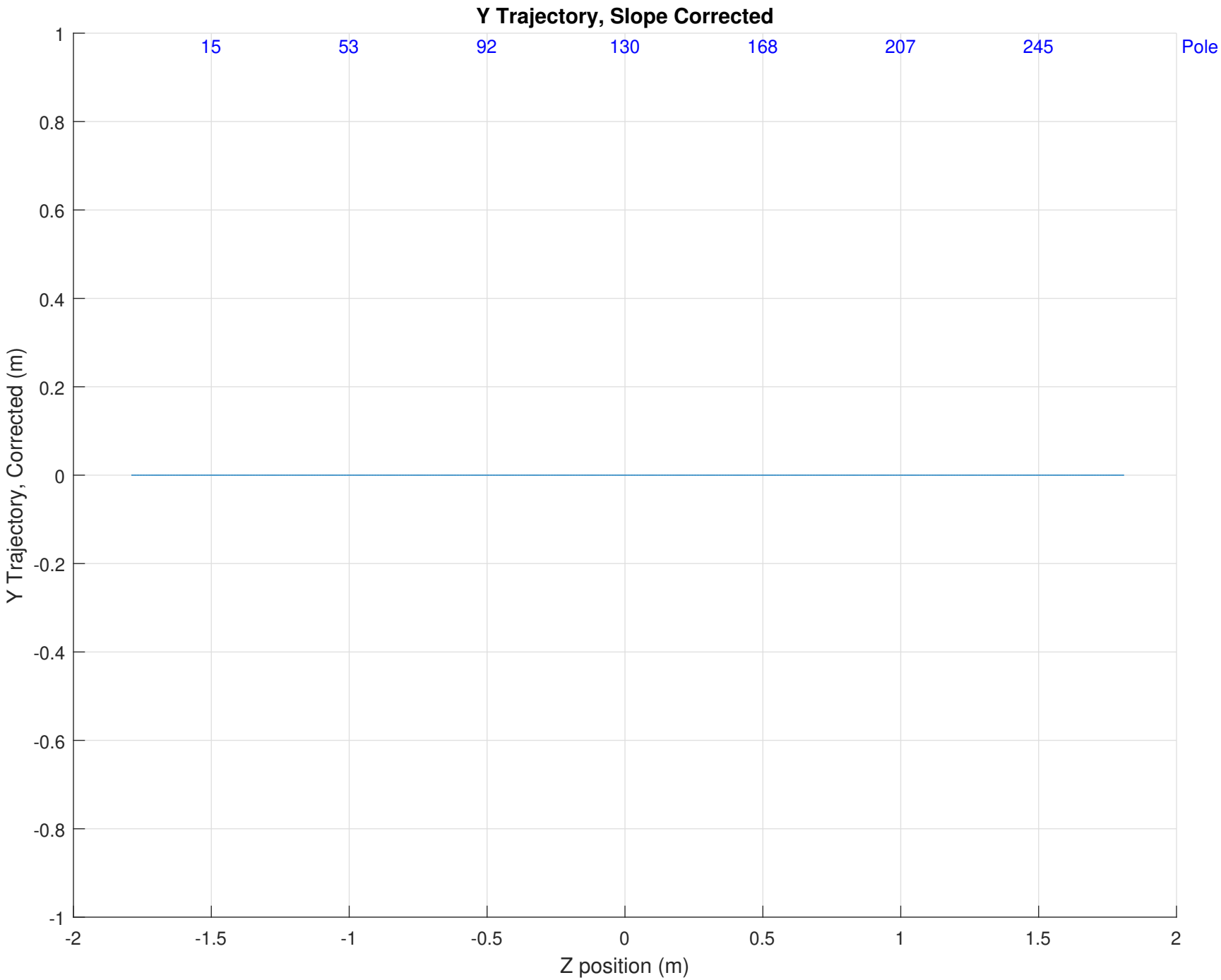

X Trajectory
10^-6
15
53
92
130
168
207
245
Pole
X (m)
10^-4
X'
X'' (1/m)
Z position (m)

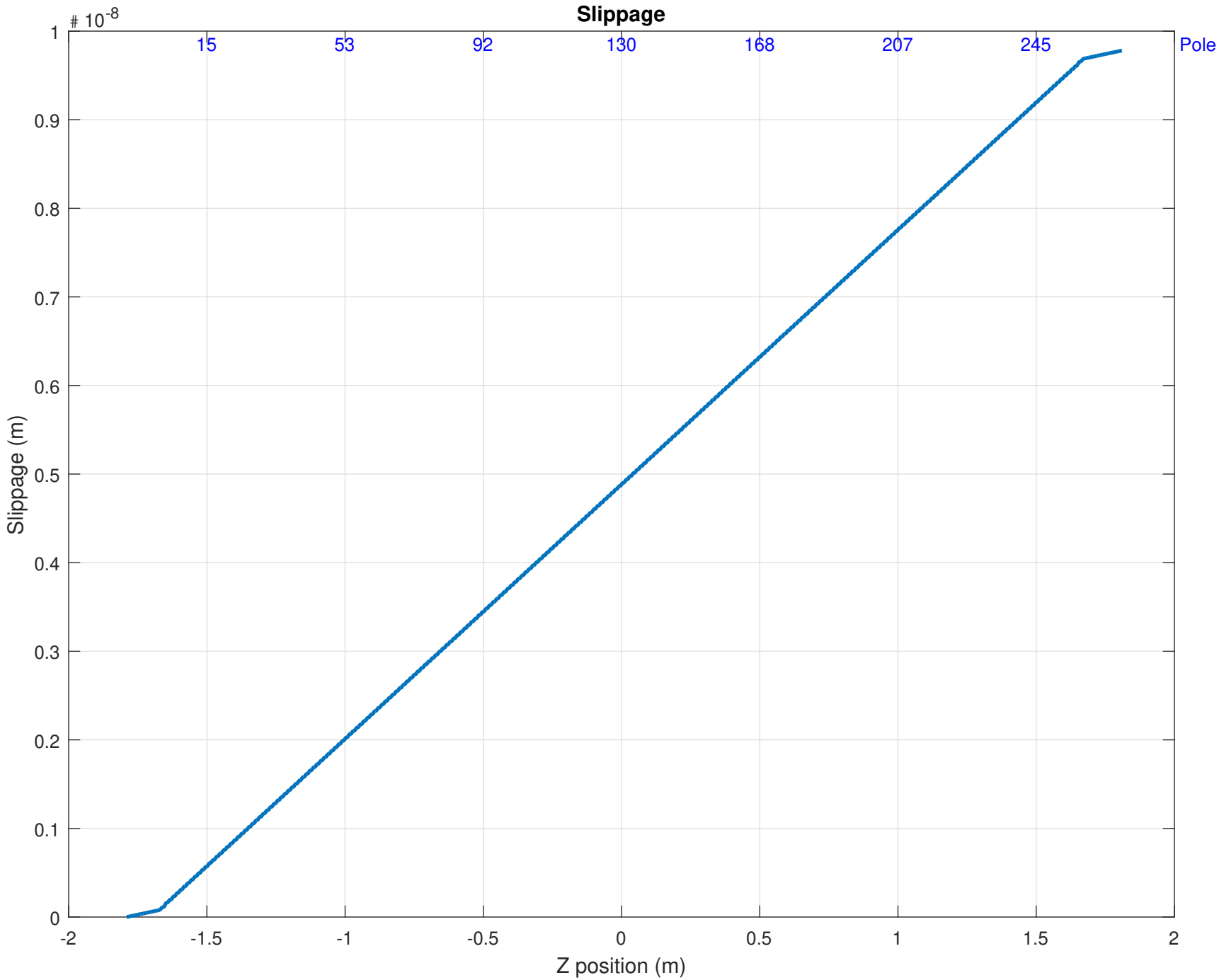

Y Trajectory
15
53
92
130
168
207
245
Pole
Y (m)
Y'
Y'' (1/m)
Z position (m)
1
0.5
0
-0.5
-1
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

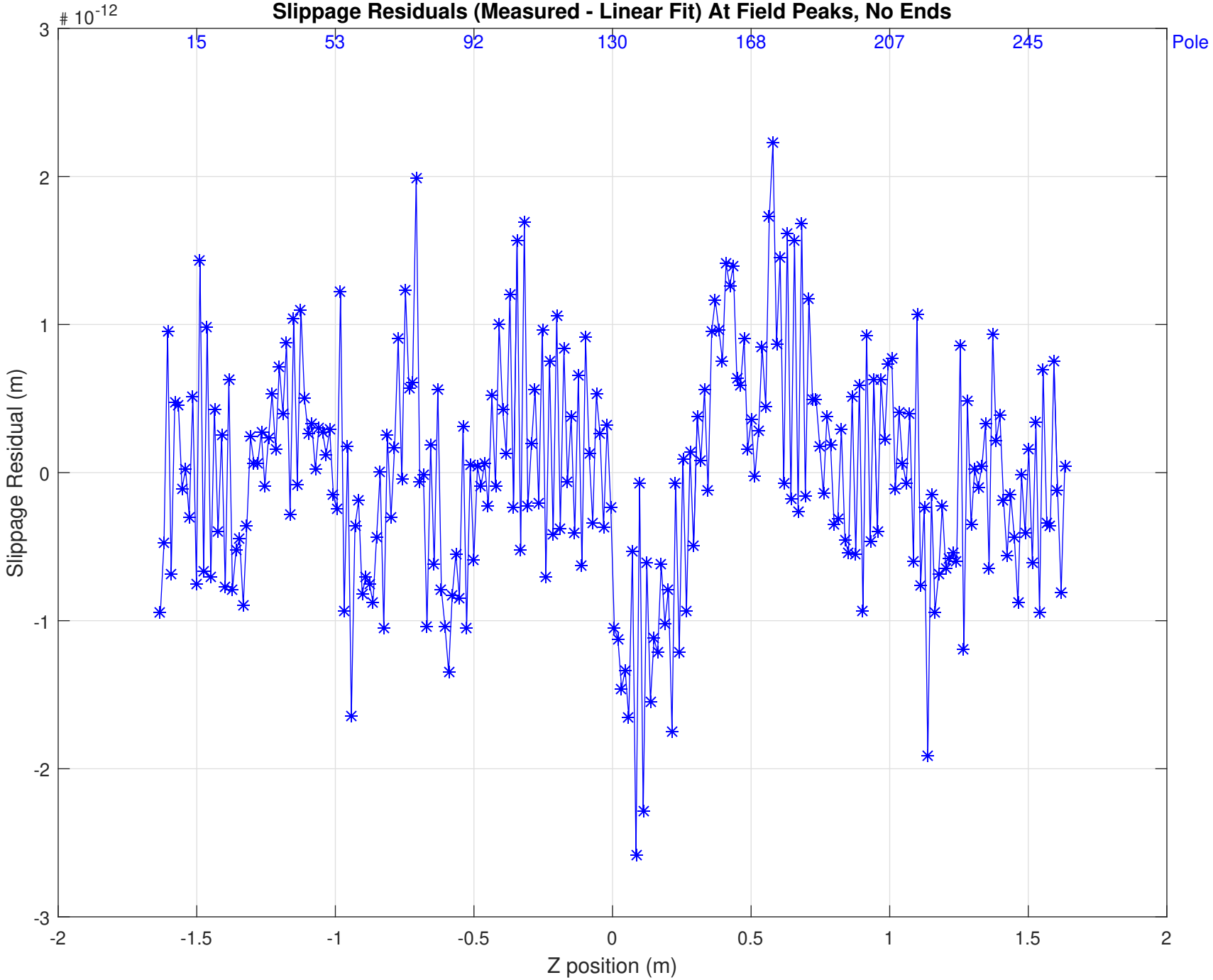

X Trajectory
10^-6
15
53
92
130
168
207
245
Pole
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
X (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)

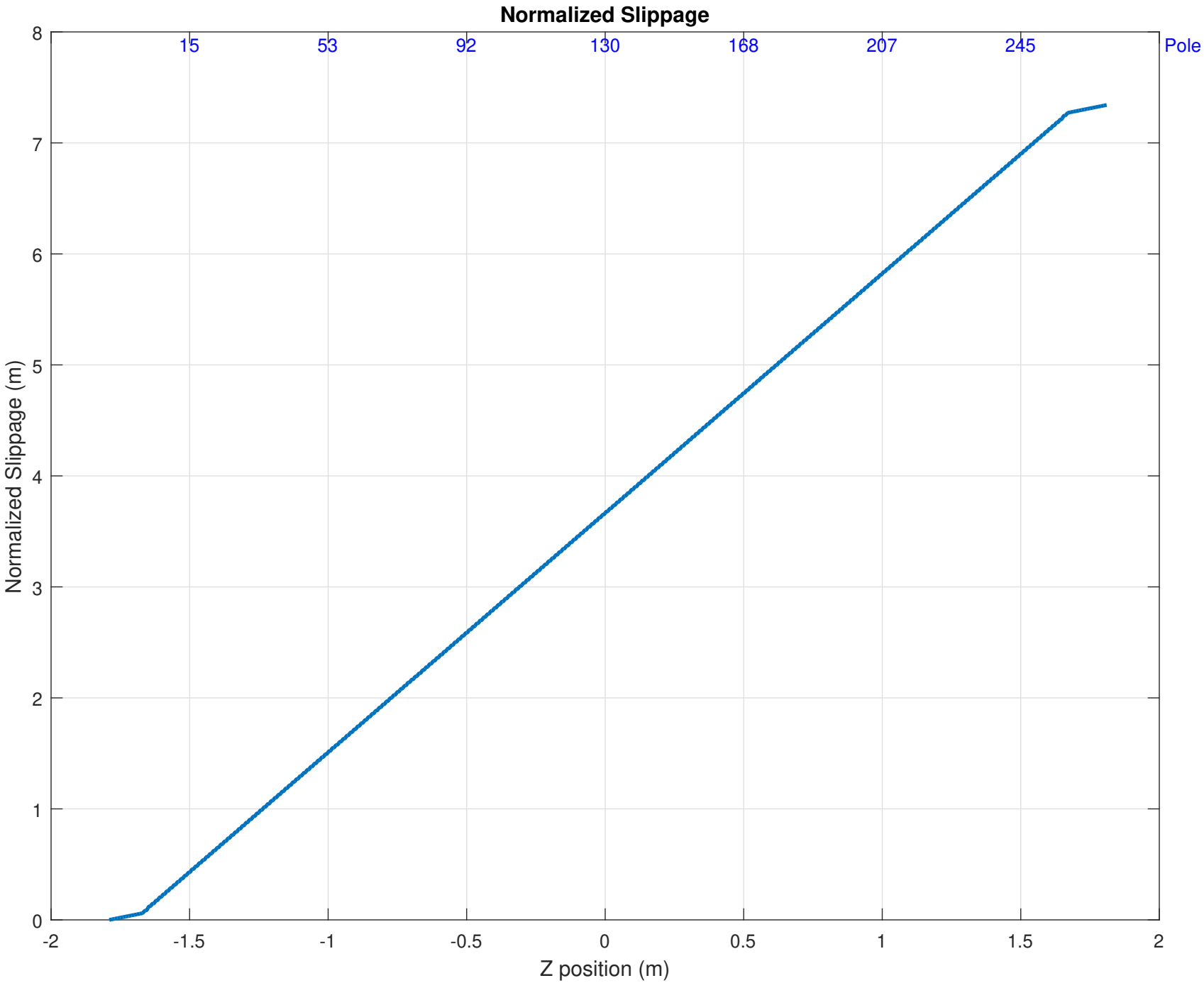

Y Trajectory
10^-6
15
53
92
130
168
207
245
Pole
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
Y (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)

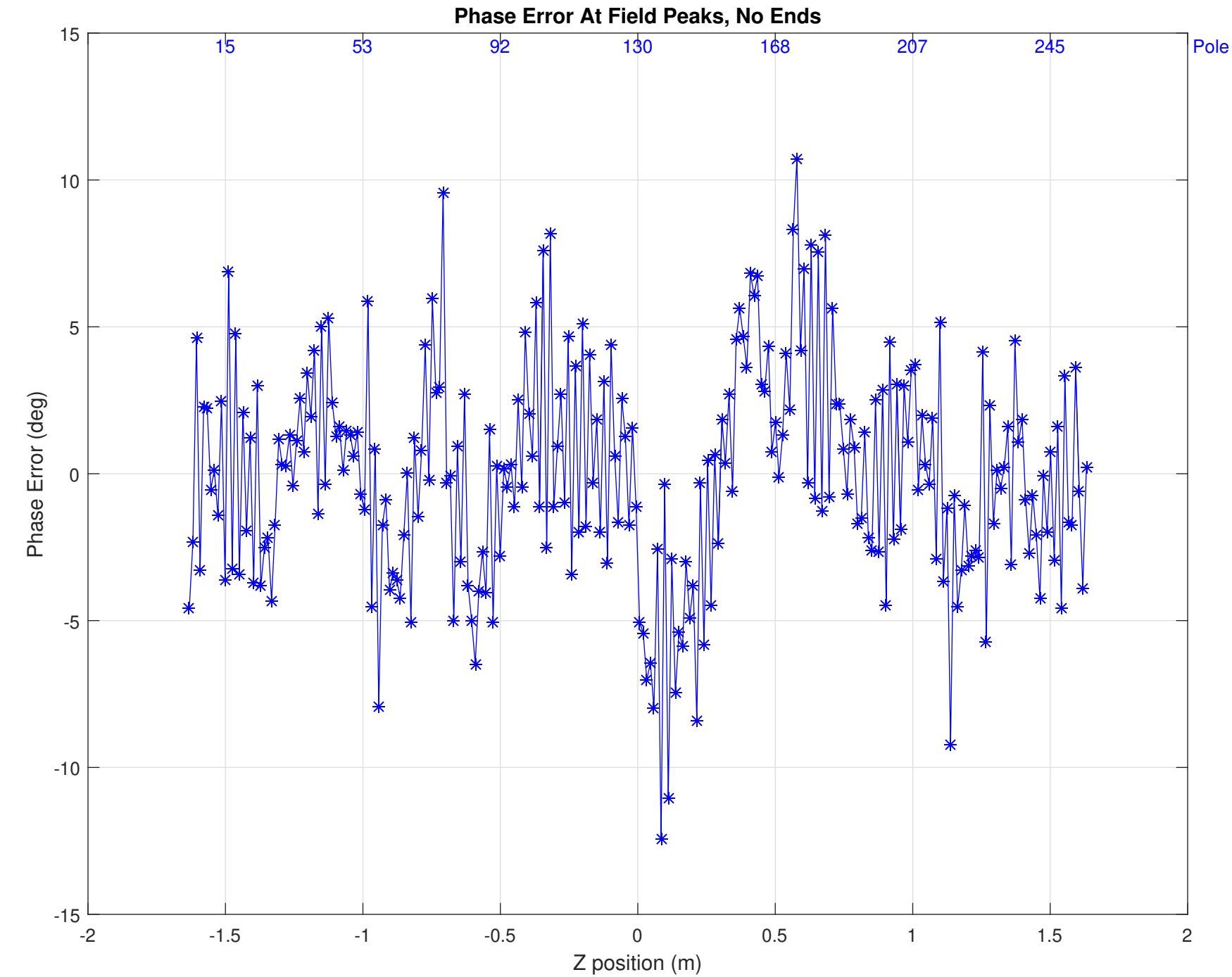

X Trajectory, Slope Corrected
10^-7
10
8
6
4
2
0
-2
-4
-6
-8
15
53
92
130
168
207
245
Pole
X Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)


Y Trajectory, Slope Corrected
15
53
92
130
168
207
245
Pole
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
Y Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)

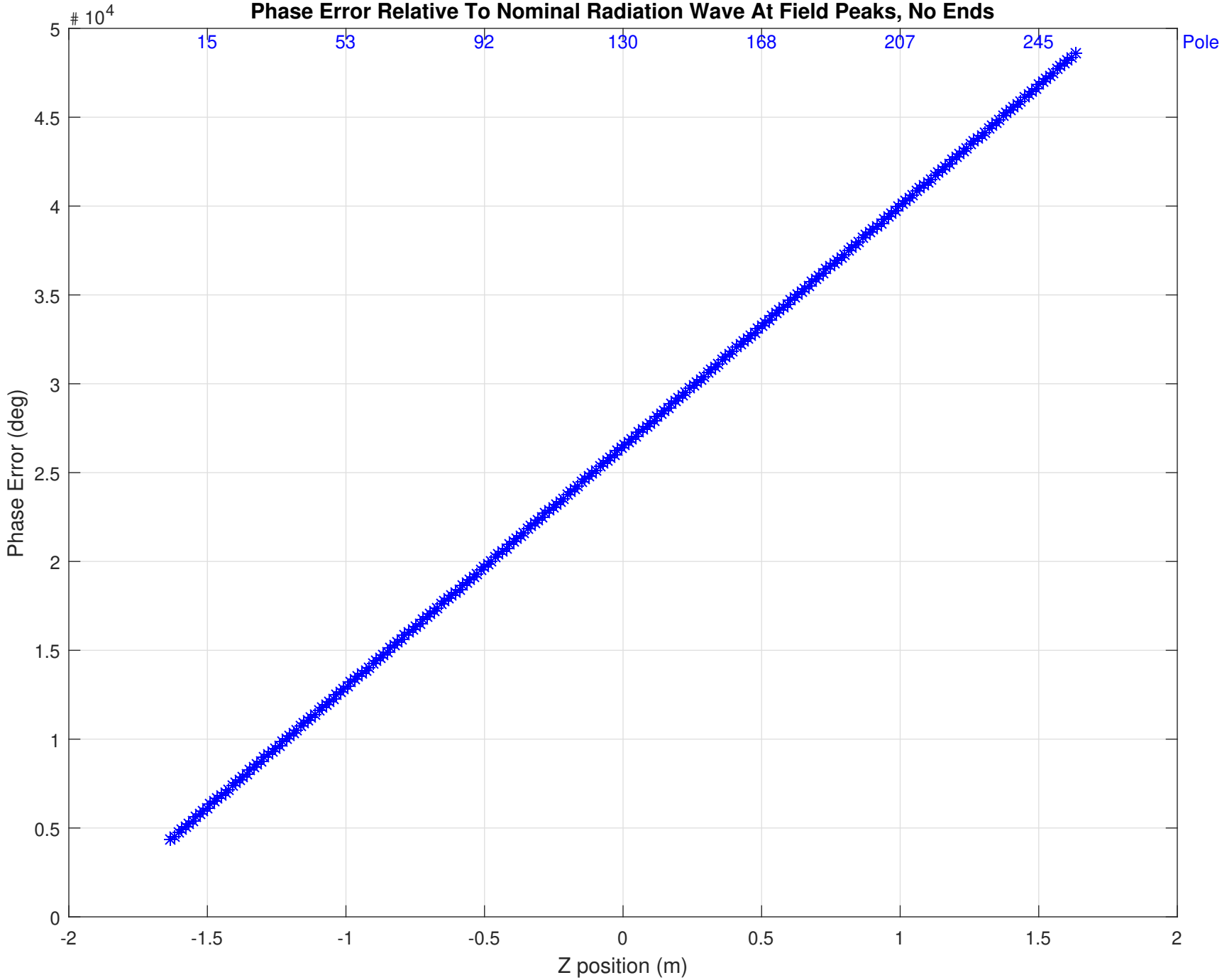

Slippage
10^-8
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Slippage (m)
15
53
92
130
168
207
245
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)


Slippage Residuals (Measured - Linear Fit) At Field Peaks, No Ends
10-12
15
53
92
130
168
207
245
Pole
3
2
1
0
-1
-2
-3
Slippage Residual (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)


Normalized Slippage
15
53
92
130
168
207
245
Pole
8
7
6
5
4
3
2
1
0
Normalized Slippage (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)



Phase Error: Ave = -0.000000 deg, RMS = 3.710873 deg


Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
10^4
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Phase Error (deg)
15
53
92
130
168
207
245
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)