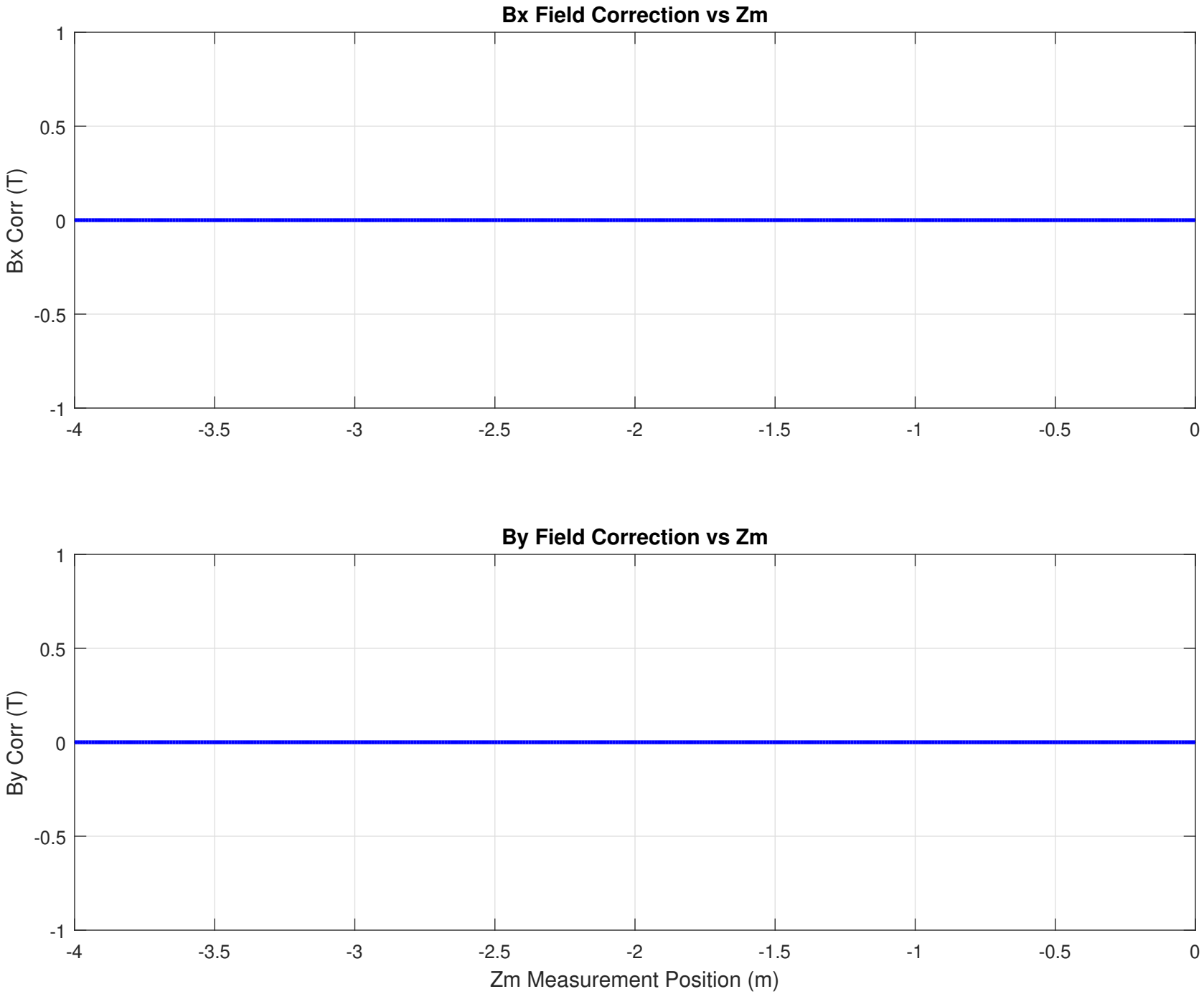
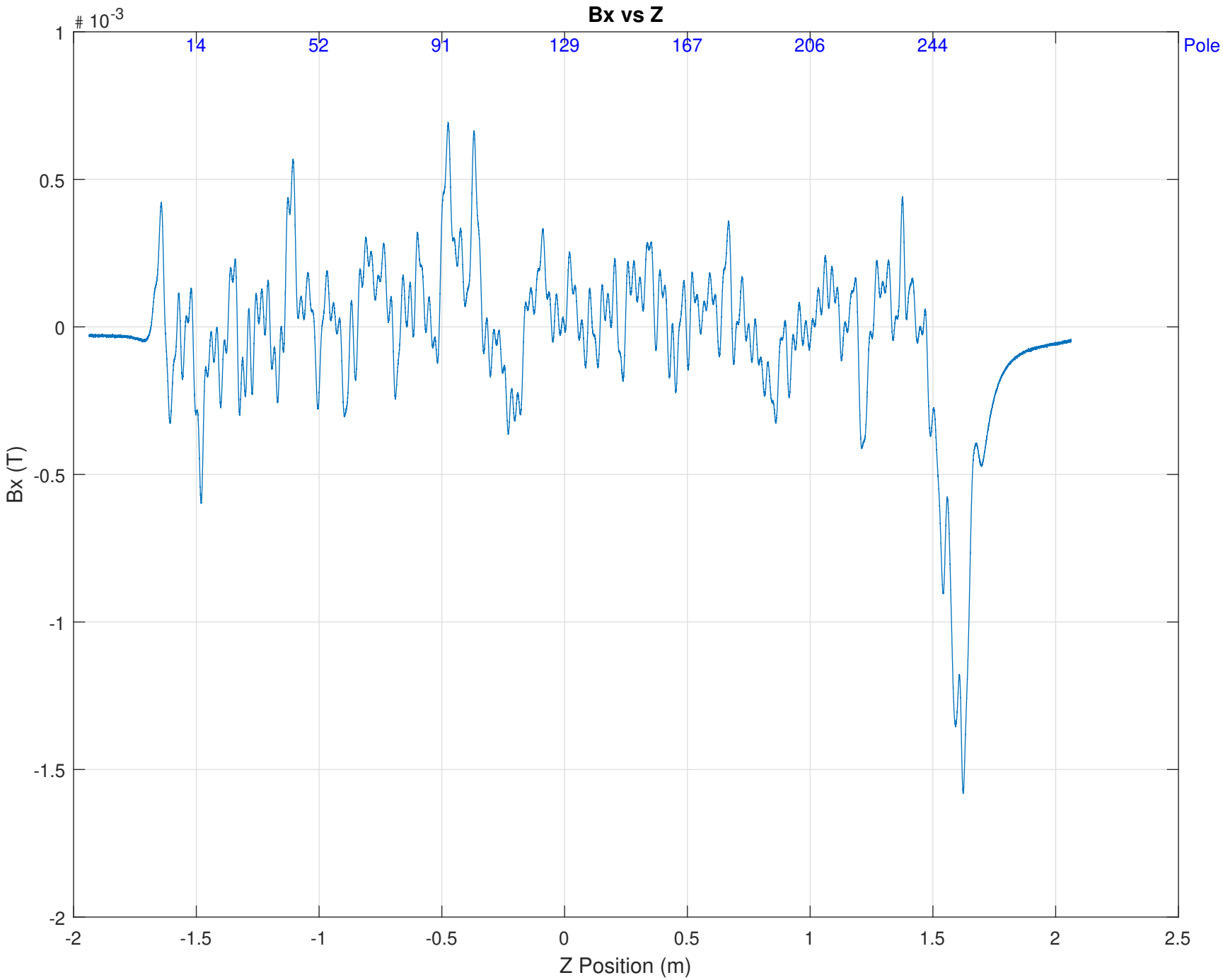
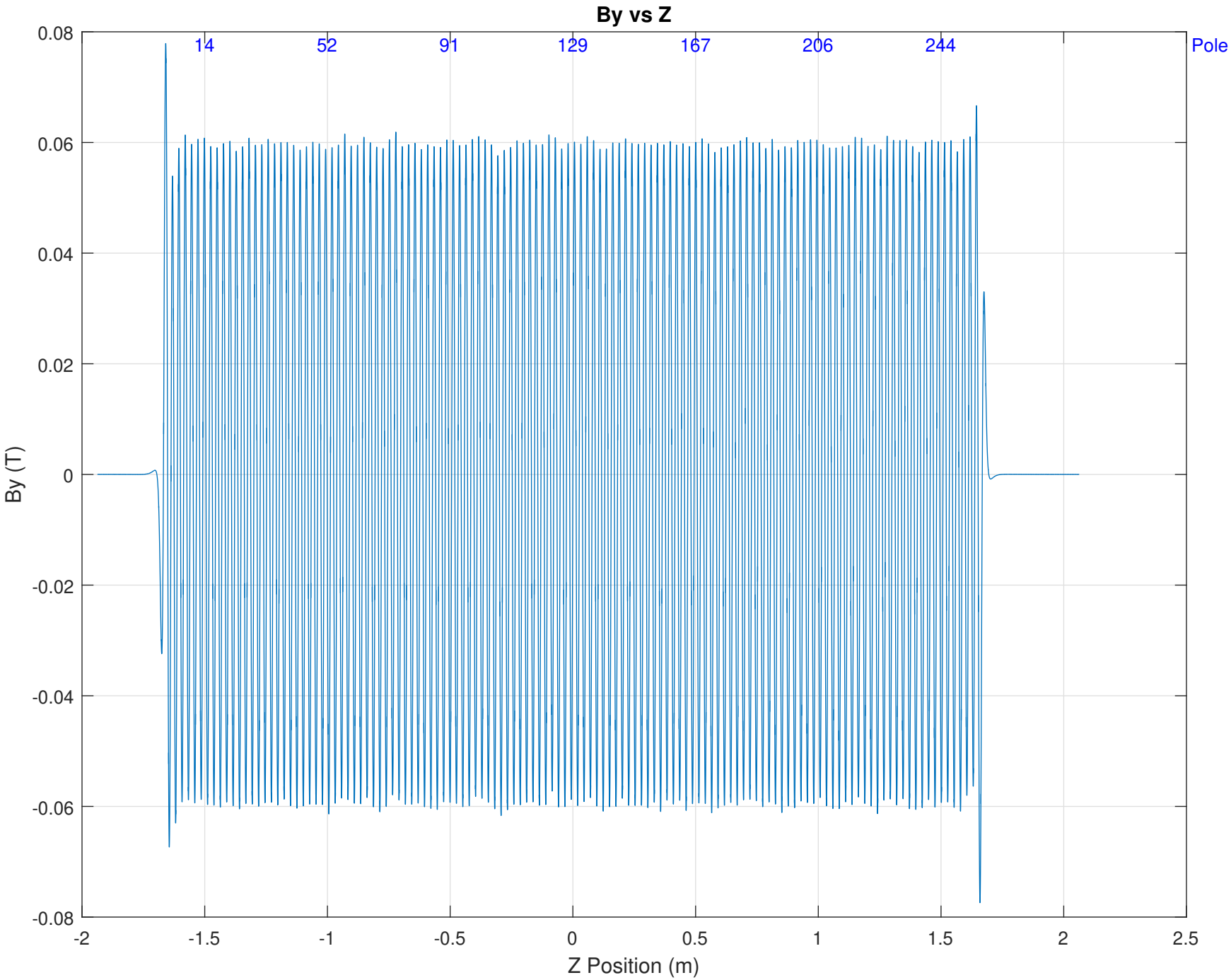
SLAC Magnetic Measurements

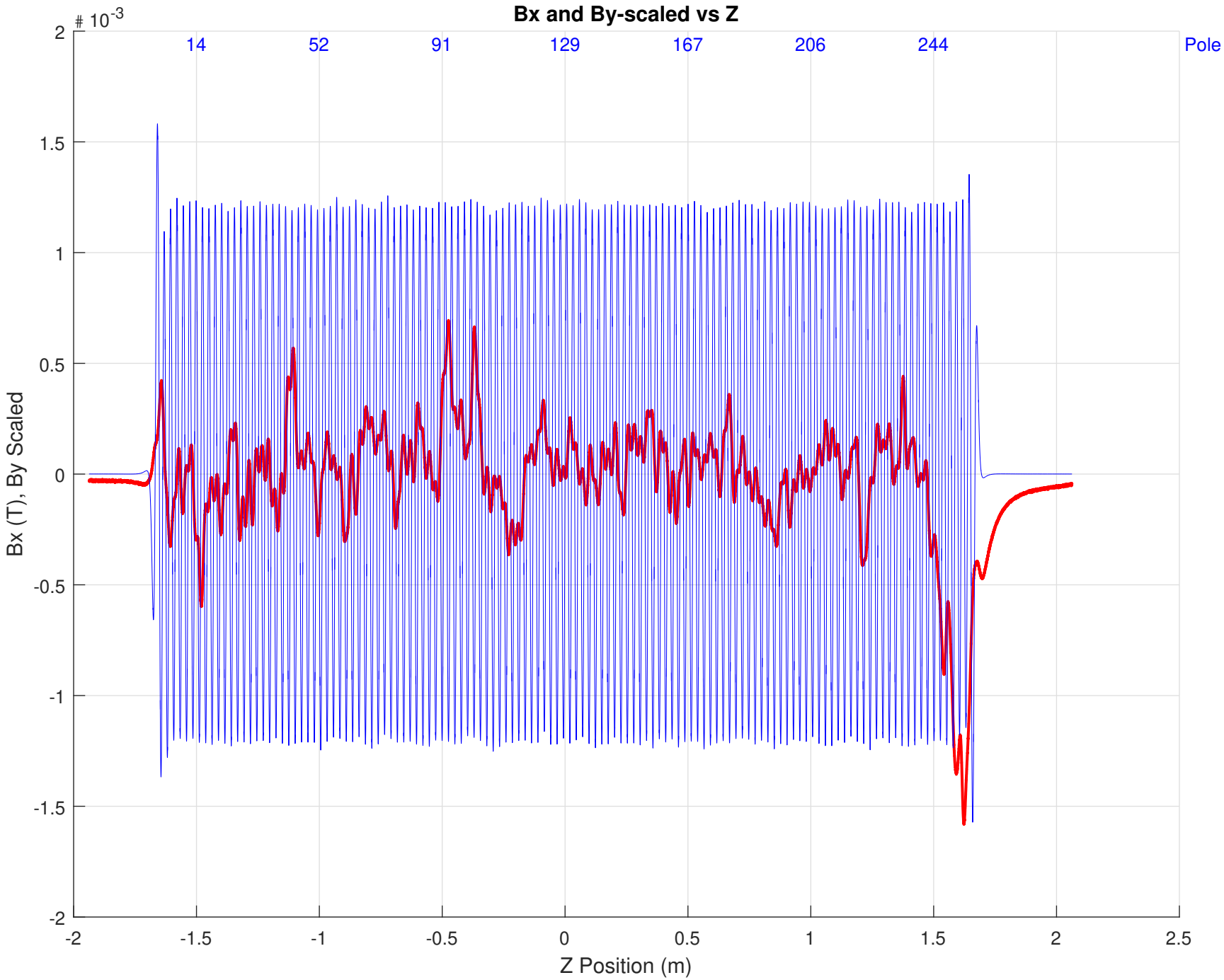
Planar Insertion Device Analysis

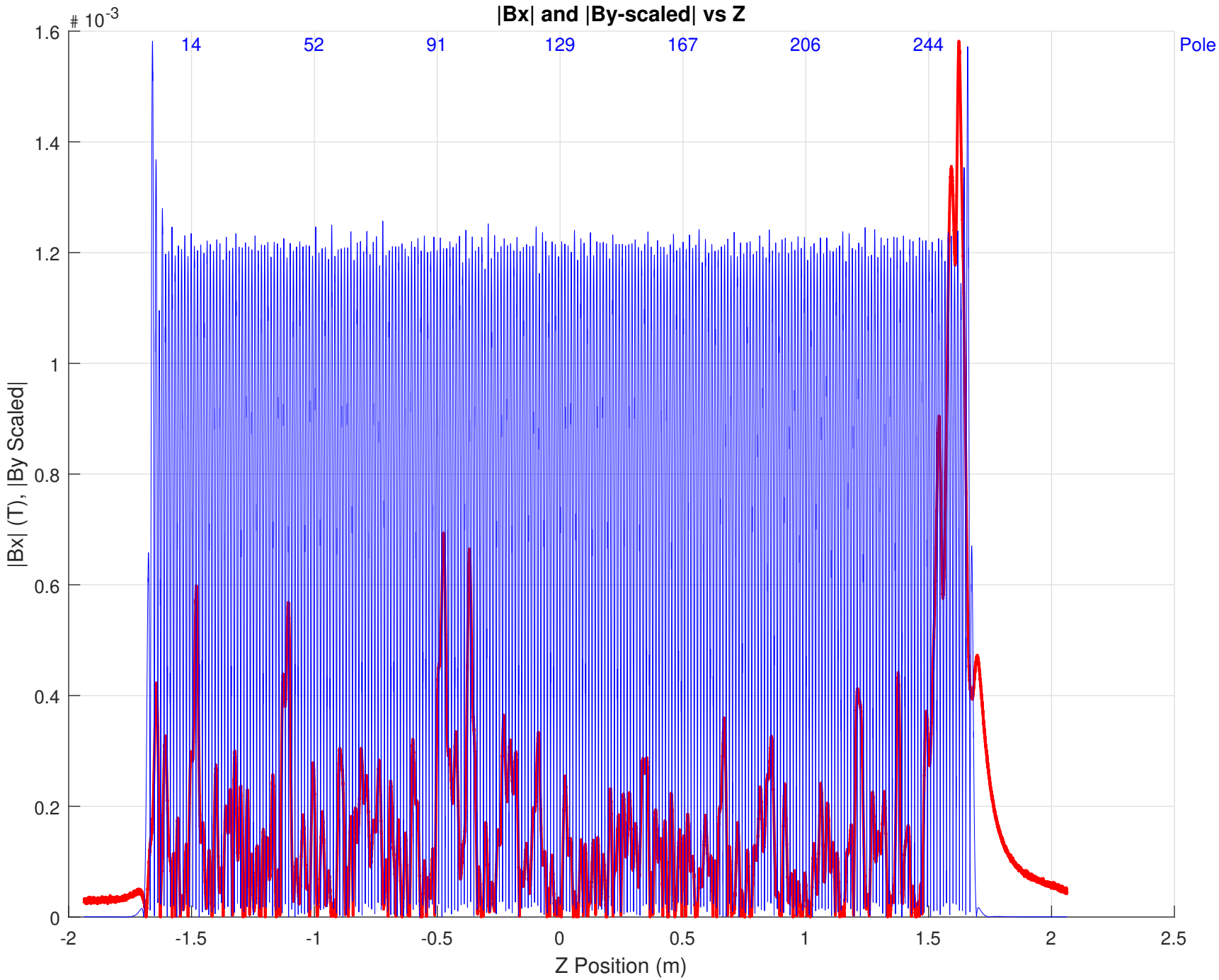
Parameters:
INPUT-FILE-DIR =s:\magdata\LCLS2\Undulator\HGVPU\DATASET0001\Fine Tuning\Z Scans\Run 071\
INPUT-FILE-NAME =x+00000-y+000-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =1
GAMMA =26689
NOM-LAMBDA-U =0.026
NOM-K-VALUE =3.5
NOM-LAMBDA-R =1.3004e-10
NUM-POLES =258
NUM-END-POLES =4
CELL-LENGTH =3.656

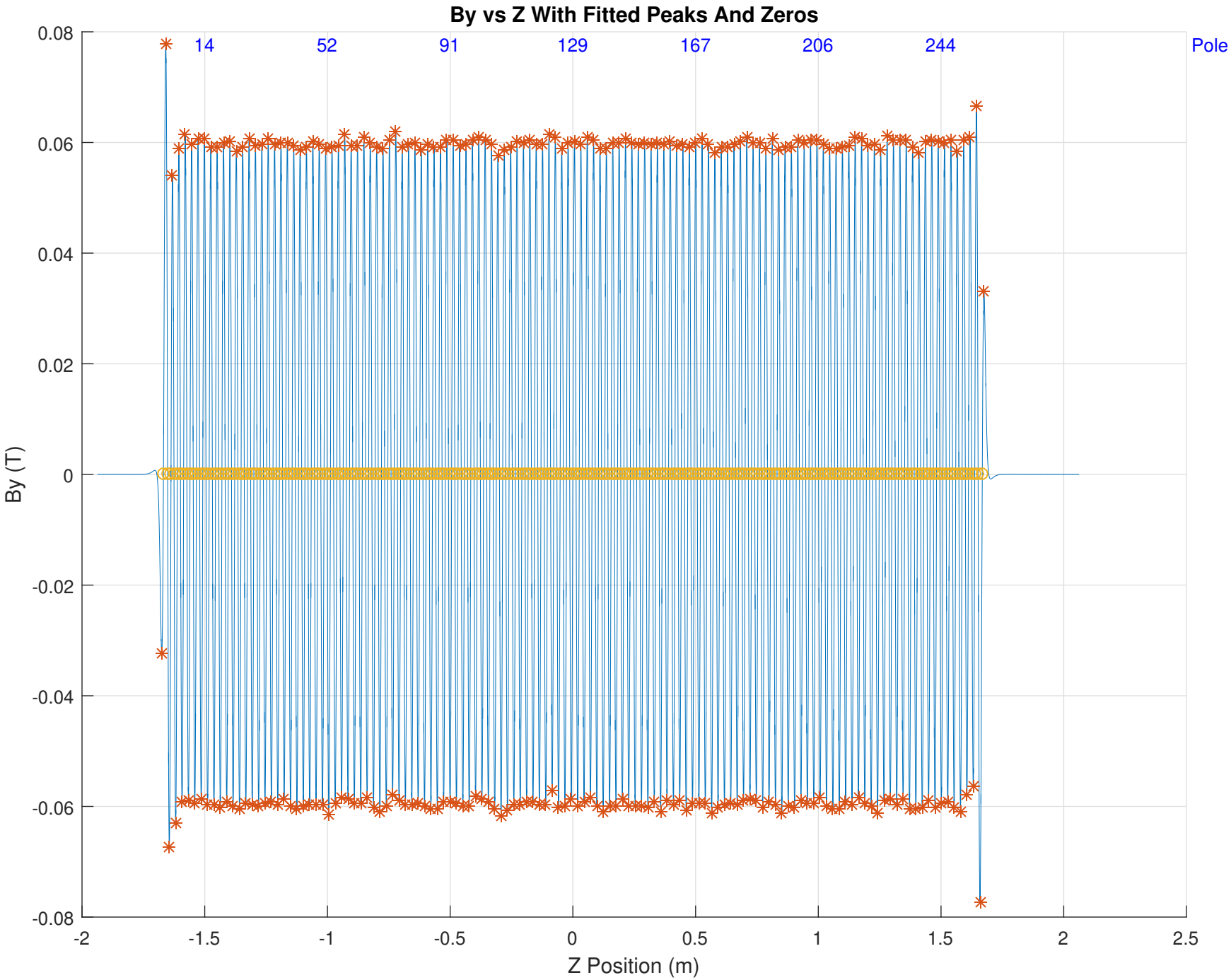

Bx Field Correction vs Zm
Bx Corr (T)
1
0.5
0
-0.5
-1
-4
-3.5
-3
-2.5
-2
-1.5
-1
-0.5
0
By Field Correction vs Zm
By Corr (T)
1
0.5
0
-0.5
-1
-4
-3.5
-3
-2.5
-2
-1.5
-1
-0.5
0
Zm Measurement Position (m)

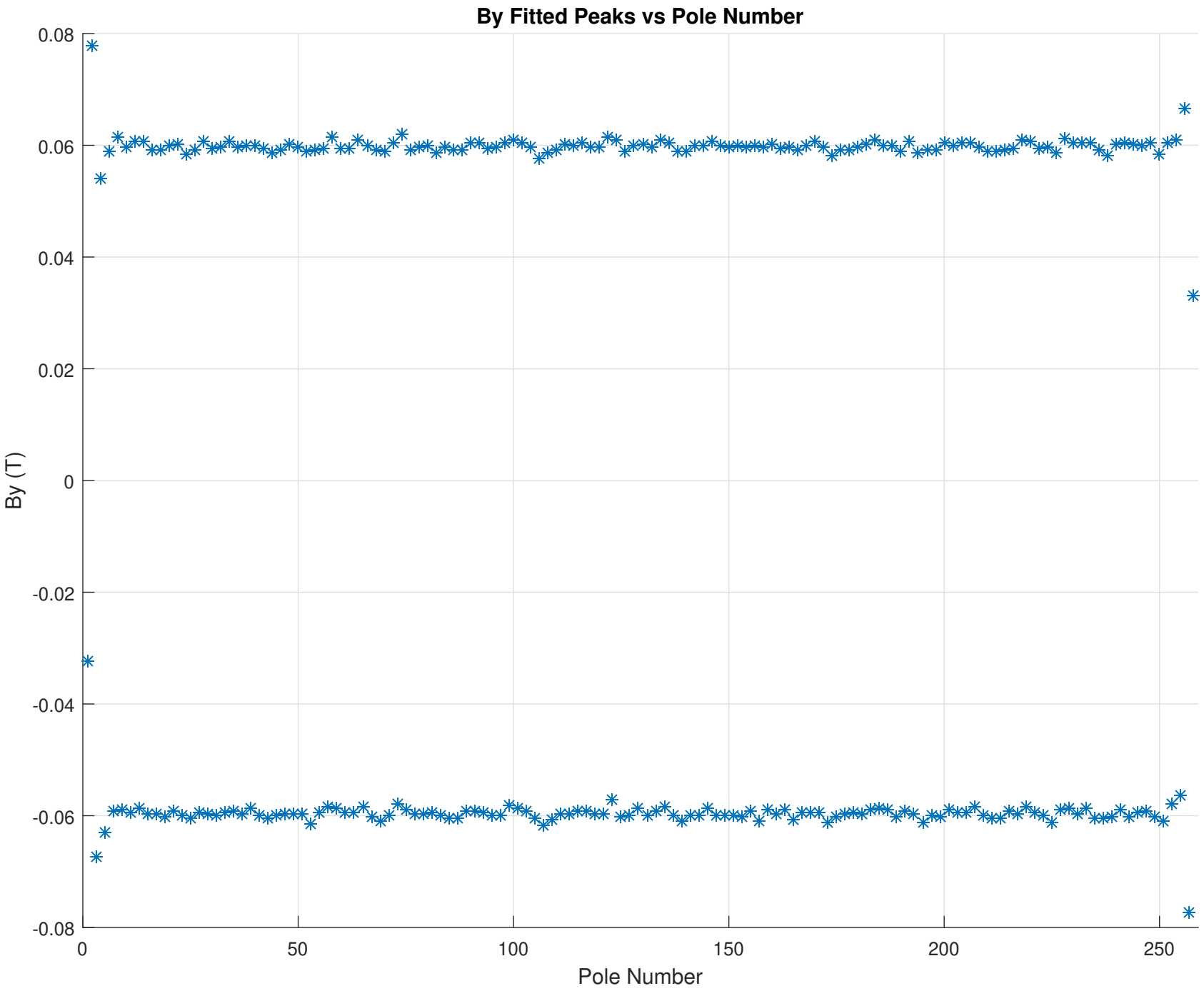

Bx vs Z
10^-3
1
0.5
0
-0.5
-1
-1.5
-2
14
52
91
129
167
206
244
Pole
Bx (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)

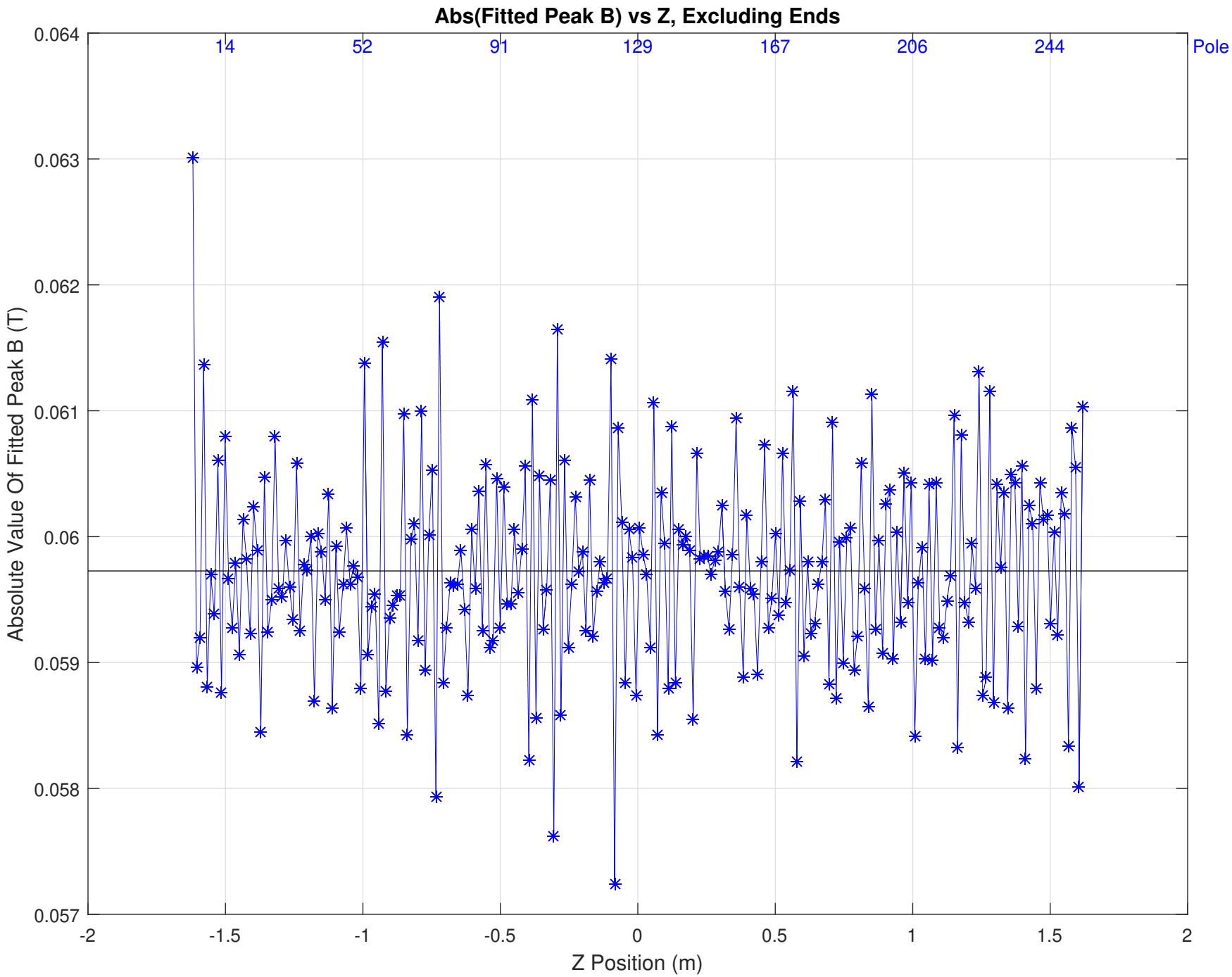

By vs Z
14
52
91
129
167
206
244
Pole
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)


Bx and By-scaled vs Z
10^-3
14
52
91
129
167
206
244
Pole
Bx (T), By Scaled
Z Position (m)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5

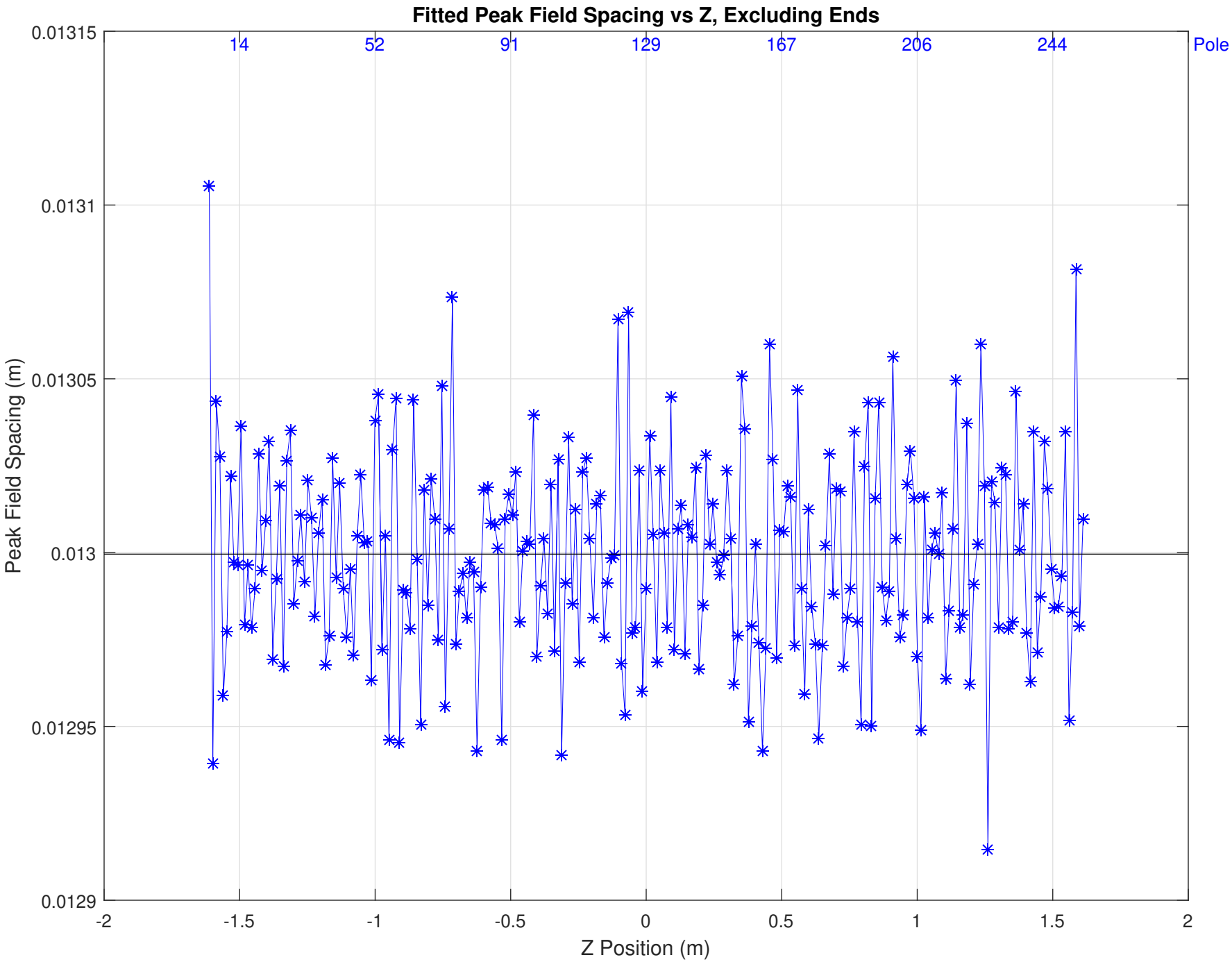

|Bx| and |By-scaled| vs Z
10-3
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
14
52
91
129
167
206
244
Pole
|Bx| (T), |By Scaled|
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)


By vs Z With Fitted Peaks And Zeros
14
52
91
129
167
206
244
Pole
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
By (T)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)

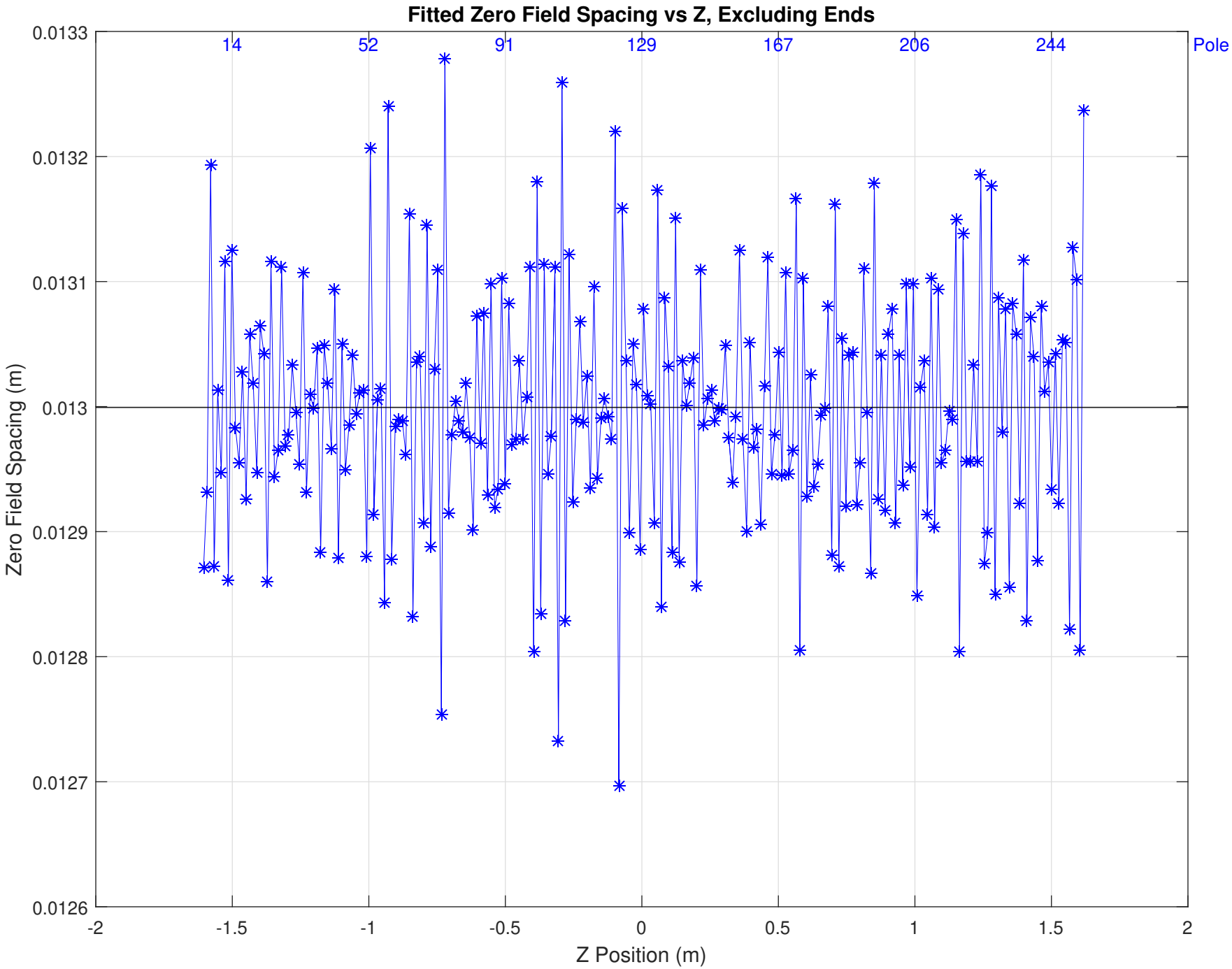

By Fitted Peaks vs Pole Number
By (T)
Pole Number
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
0
50
100
150
200
250



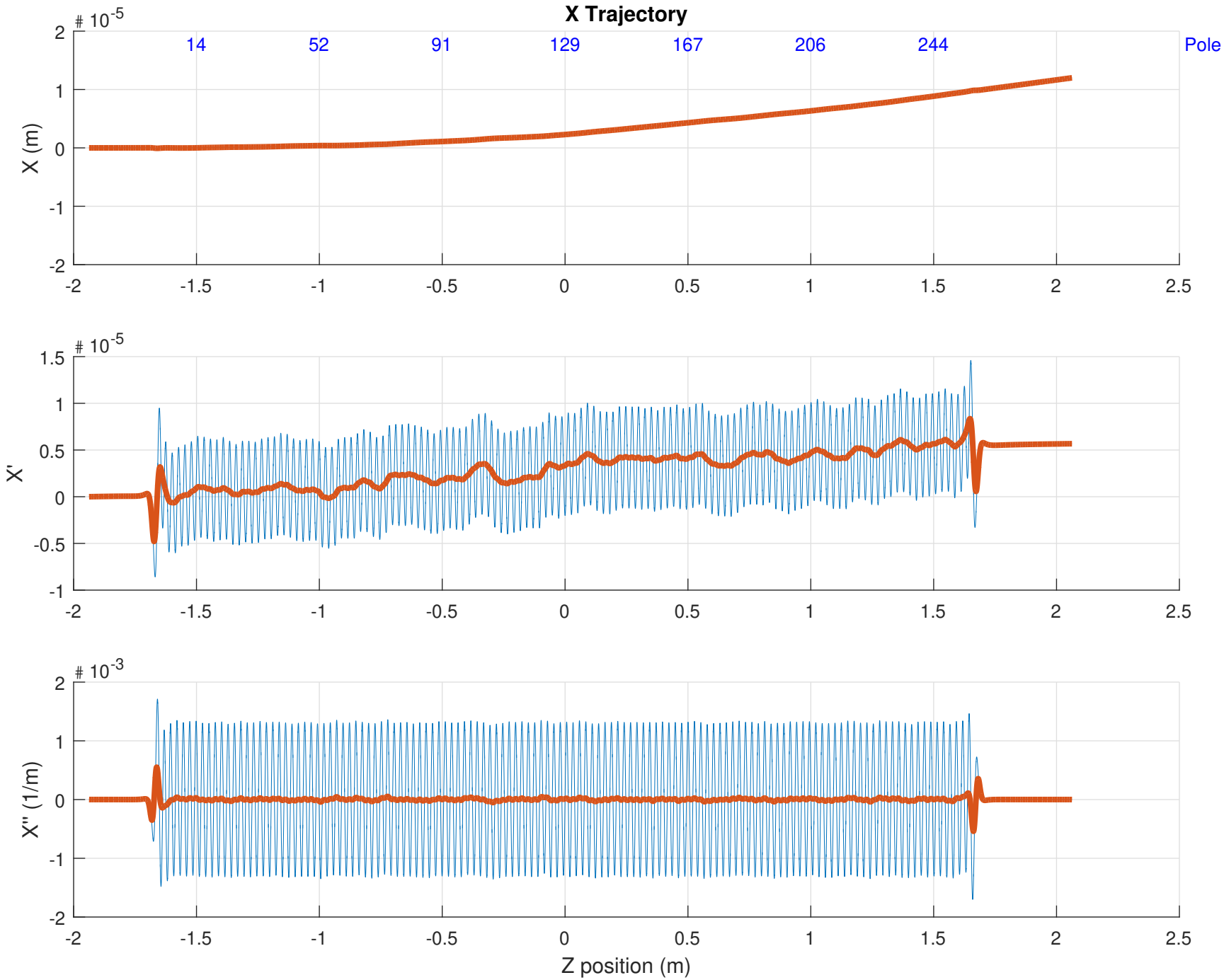
Peak Fields: Ave = 0.059728 T, RMS = 0.000798 T

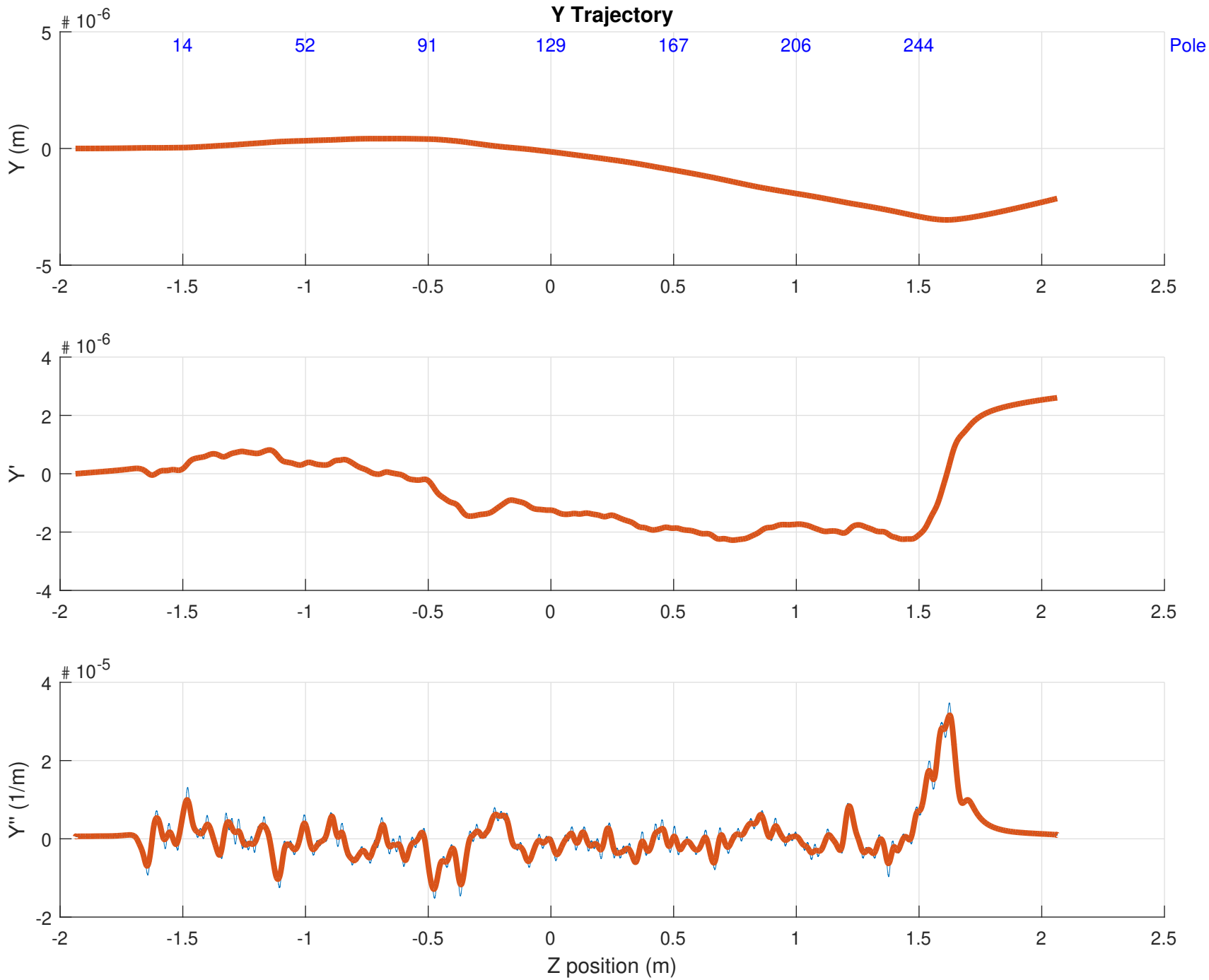


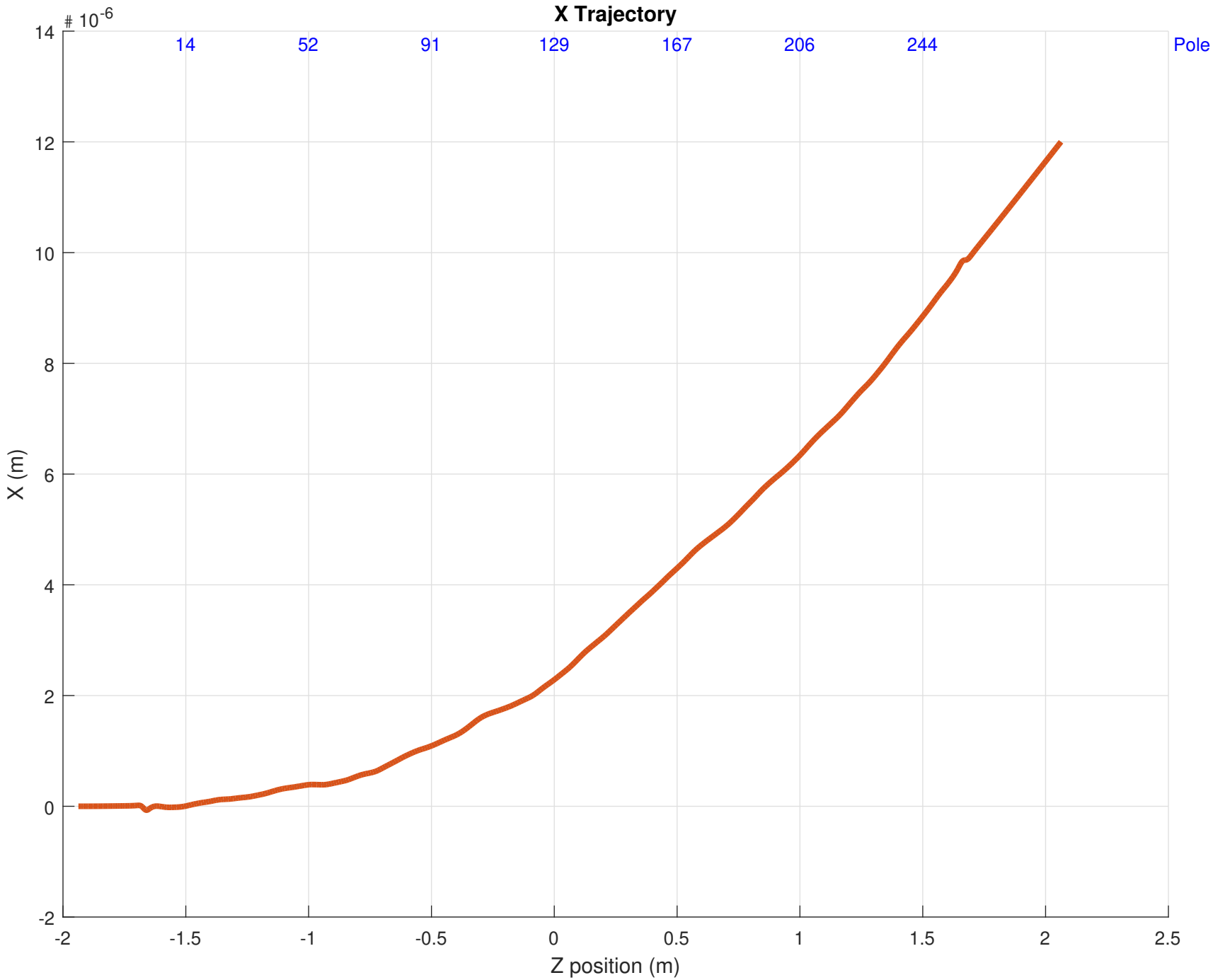
Peak Field Spacing: Ave = 0.013000 m, RMS = 0.000029 m

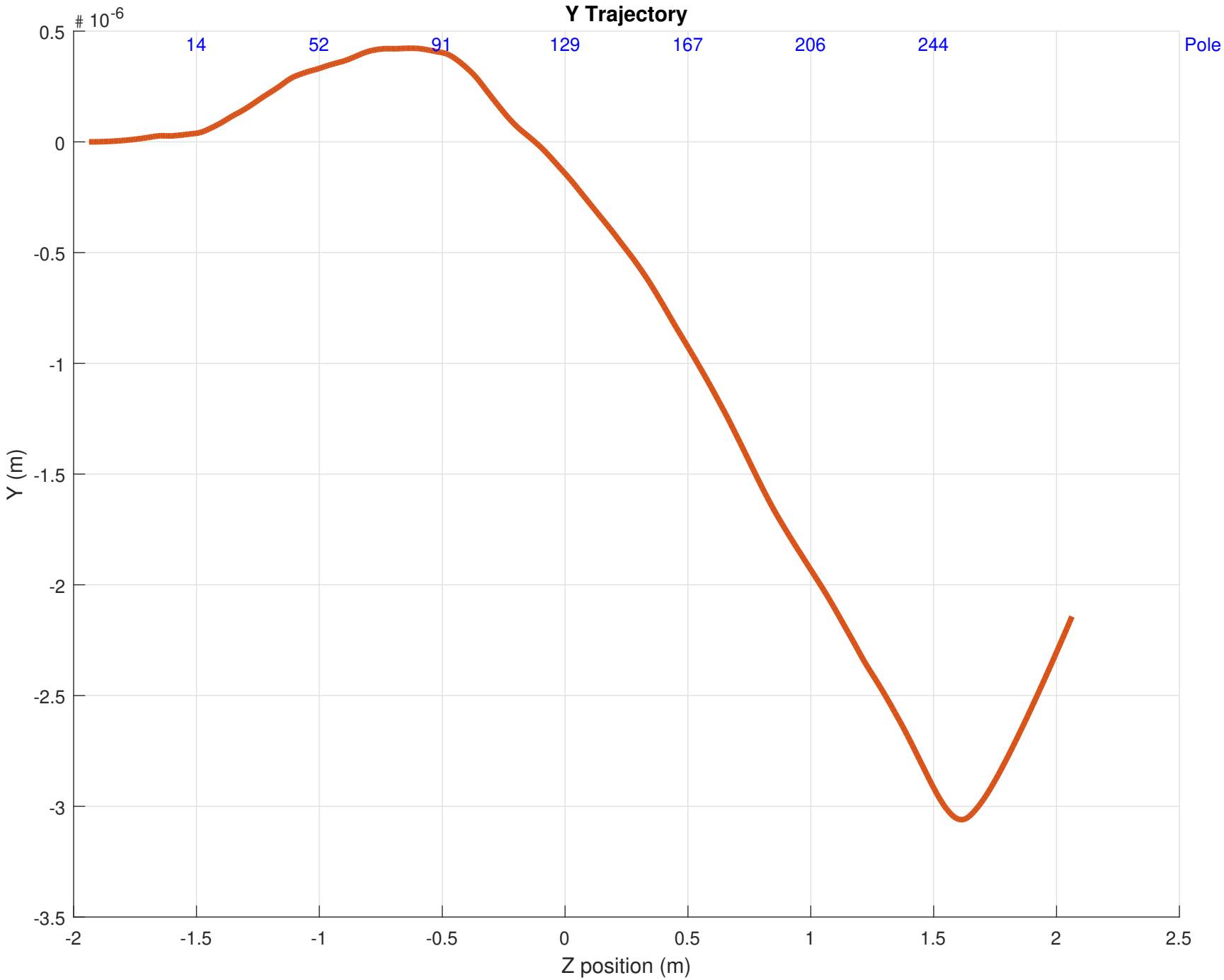


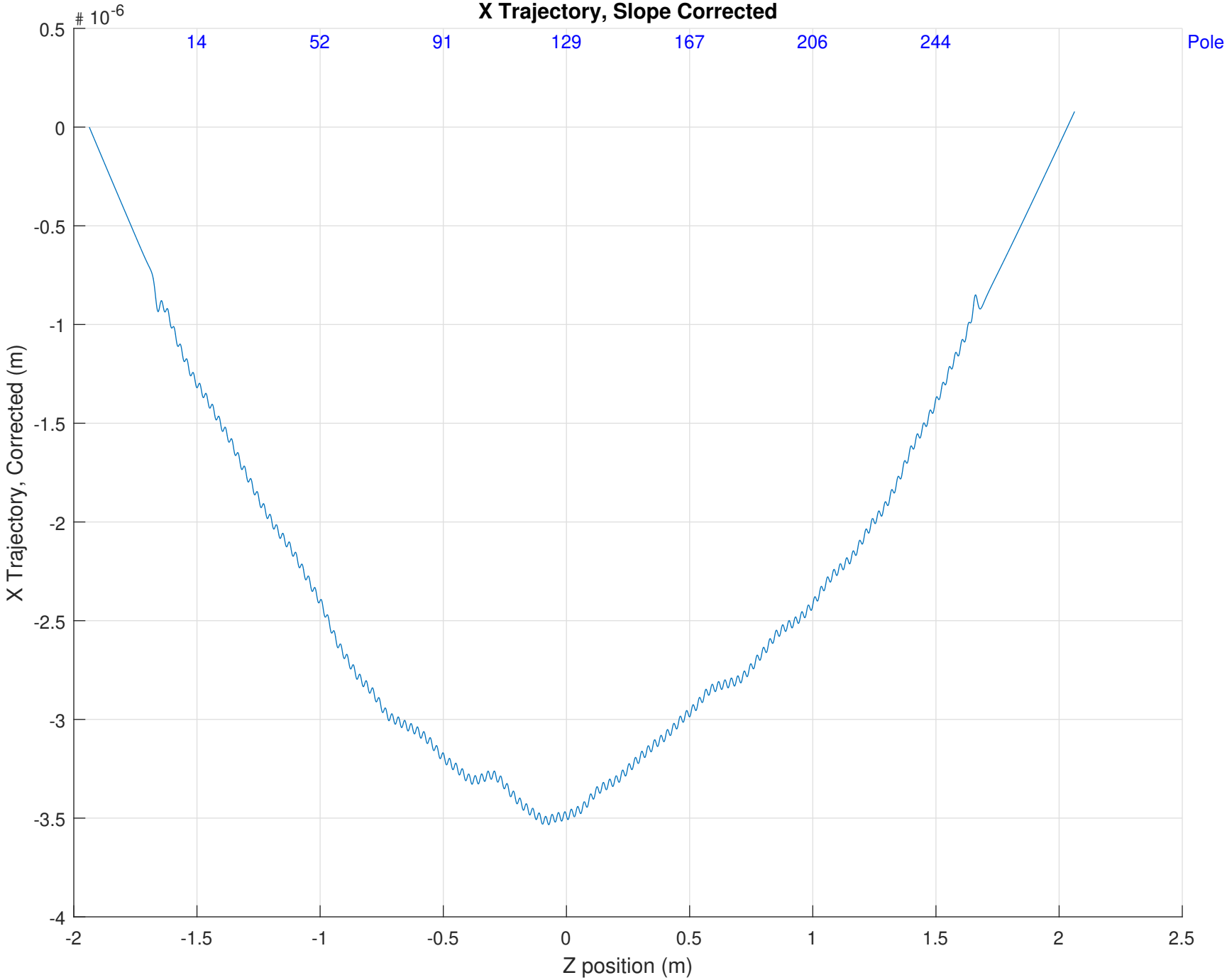
Zero Field Spacing: Ave = 0.012999 m, RMS = 0.000099 m

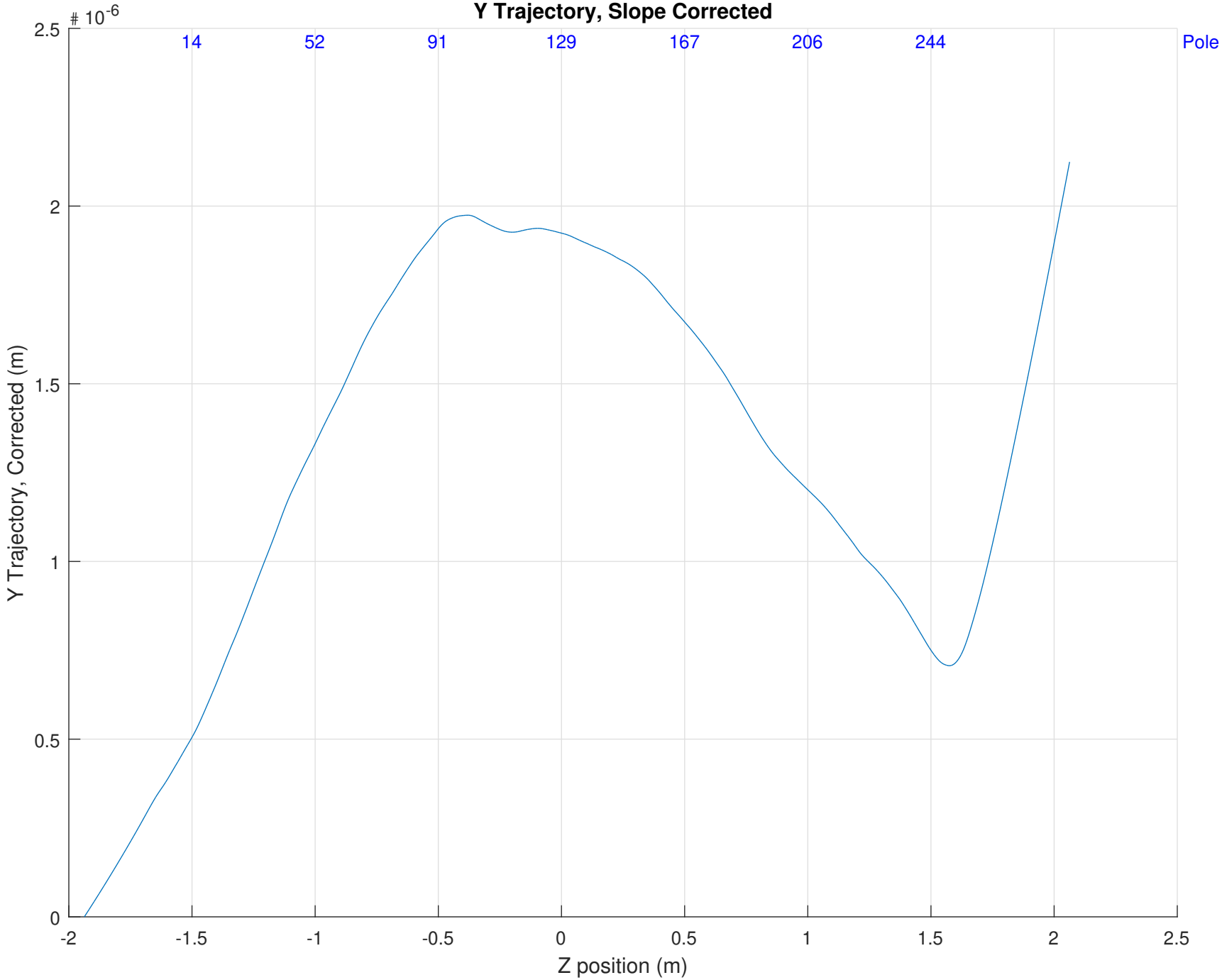

X Trajectory
10^-5
14
52
91
129
167
206
244
Pole
X (m)
10^-5
X'
10^-3
X'' (1/m)
Z position (m)

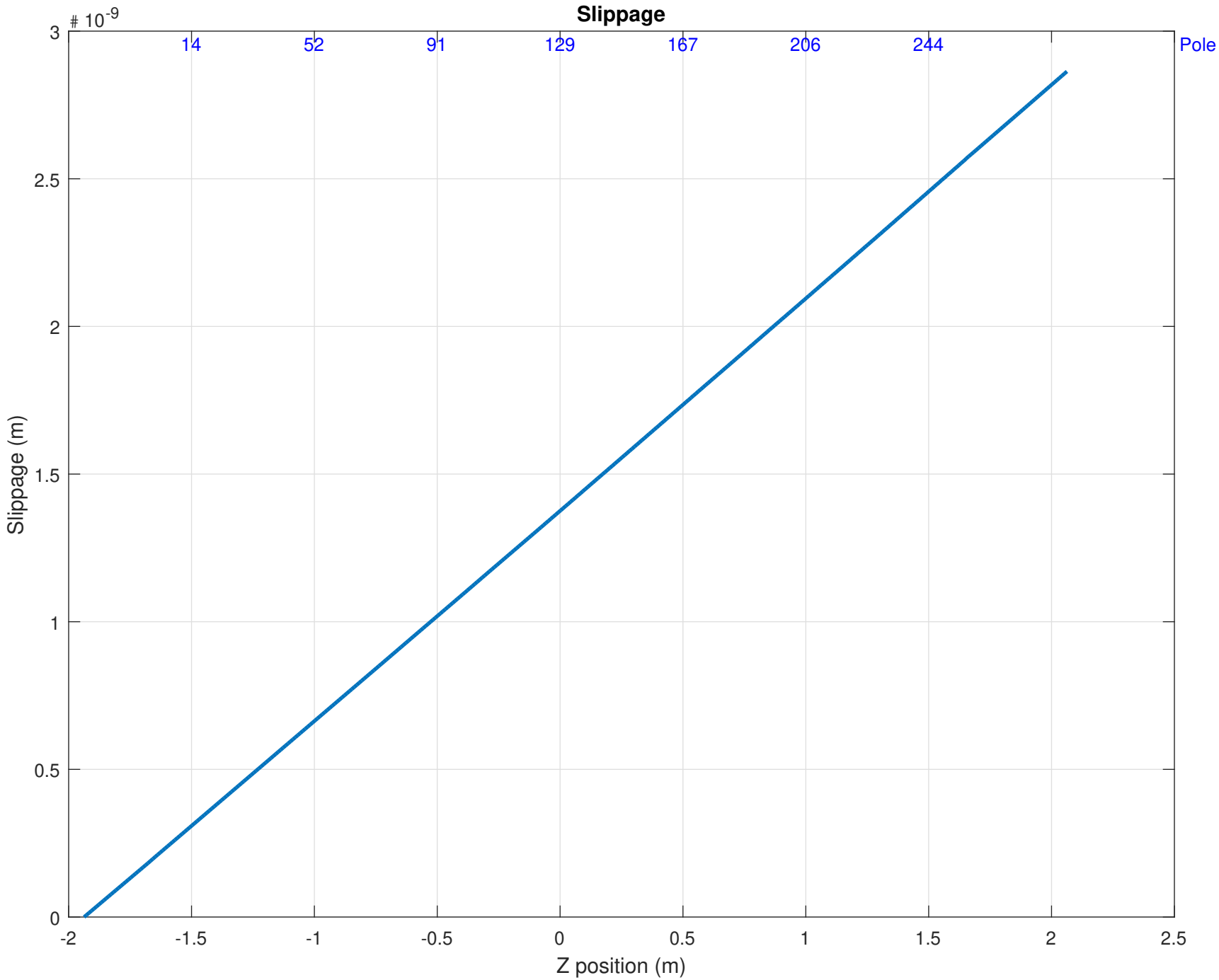

Y Trajectory
10^-6
14
52
91
129
167
206
244
Pole
Y (m)
5
0
-5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
10^-6
Y'
4
2
0
-2
-4
10^-5
Y'' (1/m)
Z position (m)

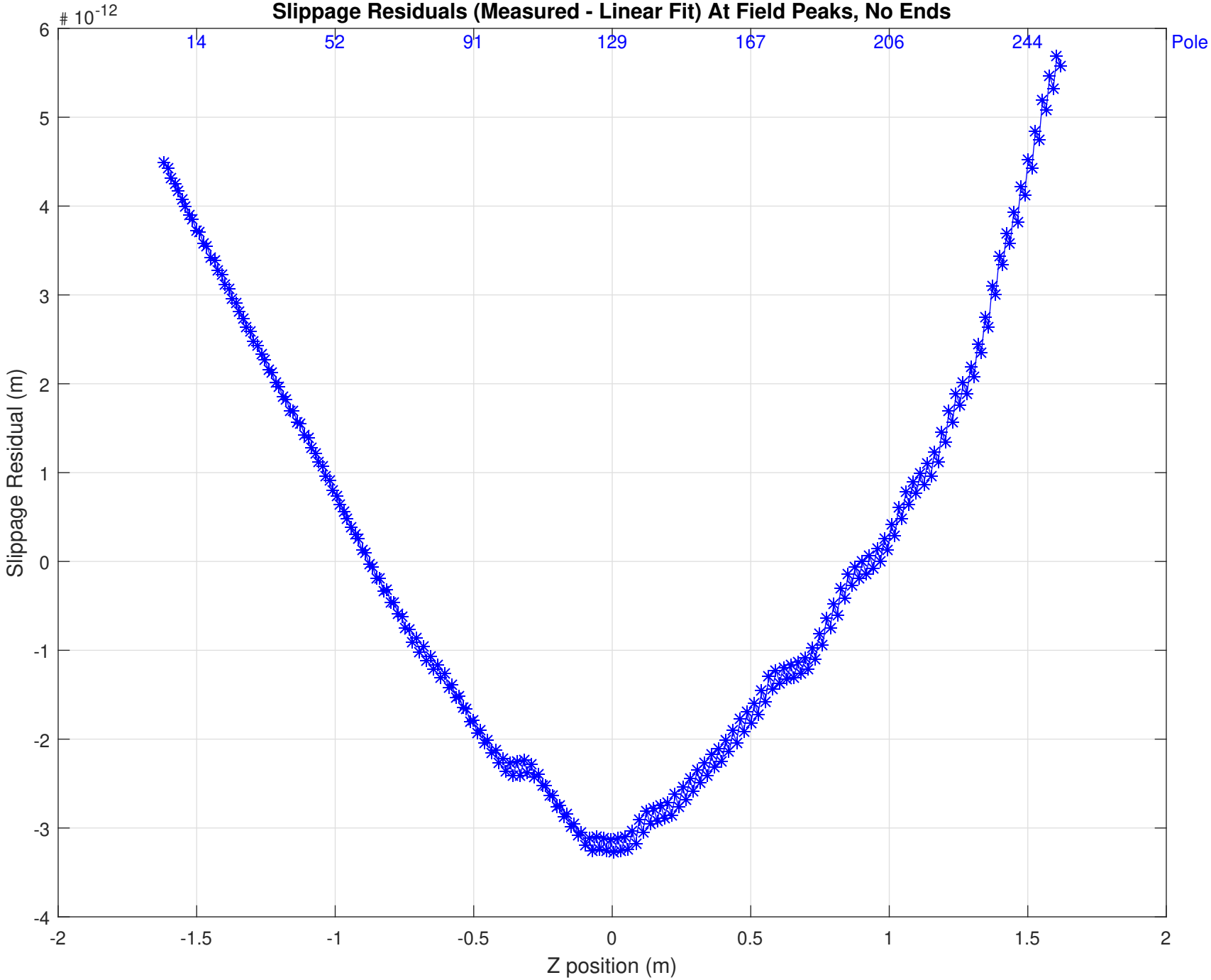

X Trajectory
10-6
14
52
91
129
167
206
244
Pole
14
12
10
8
6
4
2
0
-2
X (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

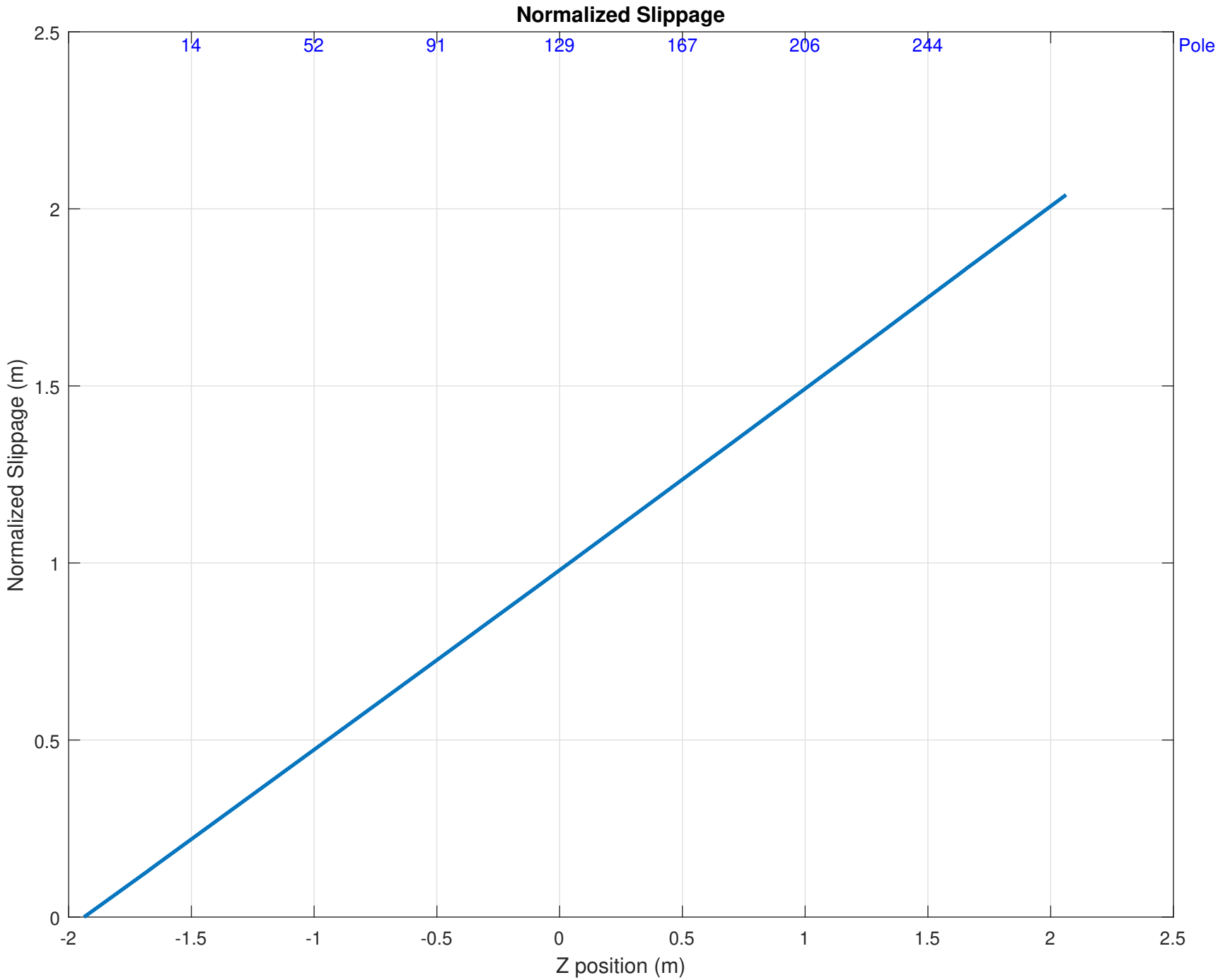

Y Trajectory
10^-6
14
52
91
129
167
206
244
Pole
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
Y (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

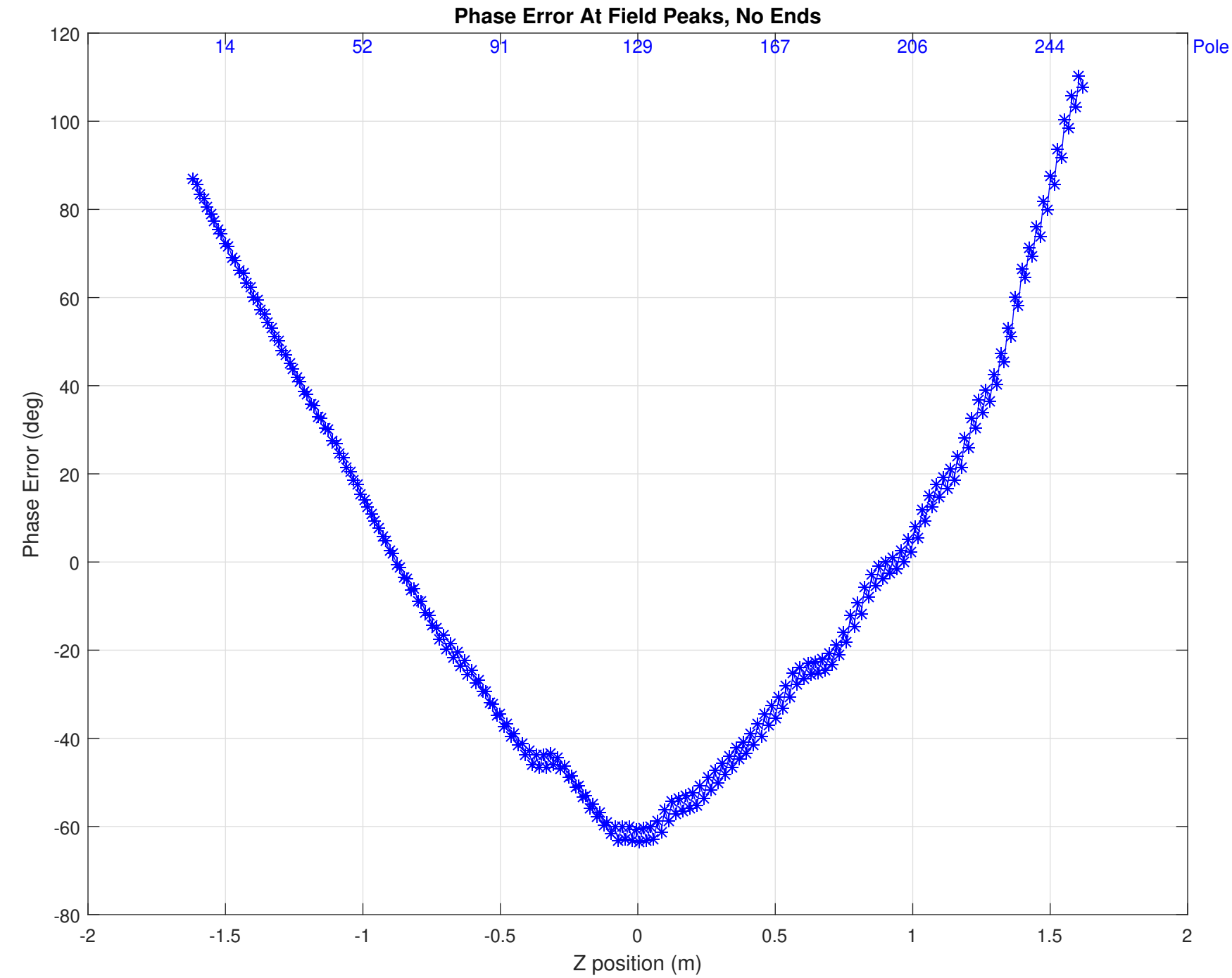

X Trajectory, Slope Corrected
10^-6
14
52
91
129
167
206
244
Pole
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
X Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


Y Trajectory, Slope Corrected
10-6
2.5
2
1.5
1
0.5
0
14
52
91
129
167
206
244
Pole
Y Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)

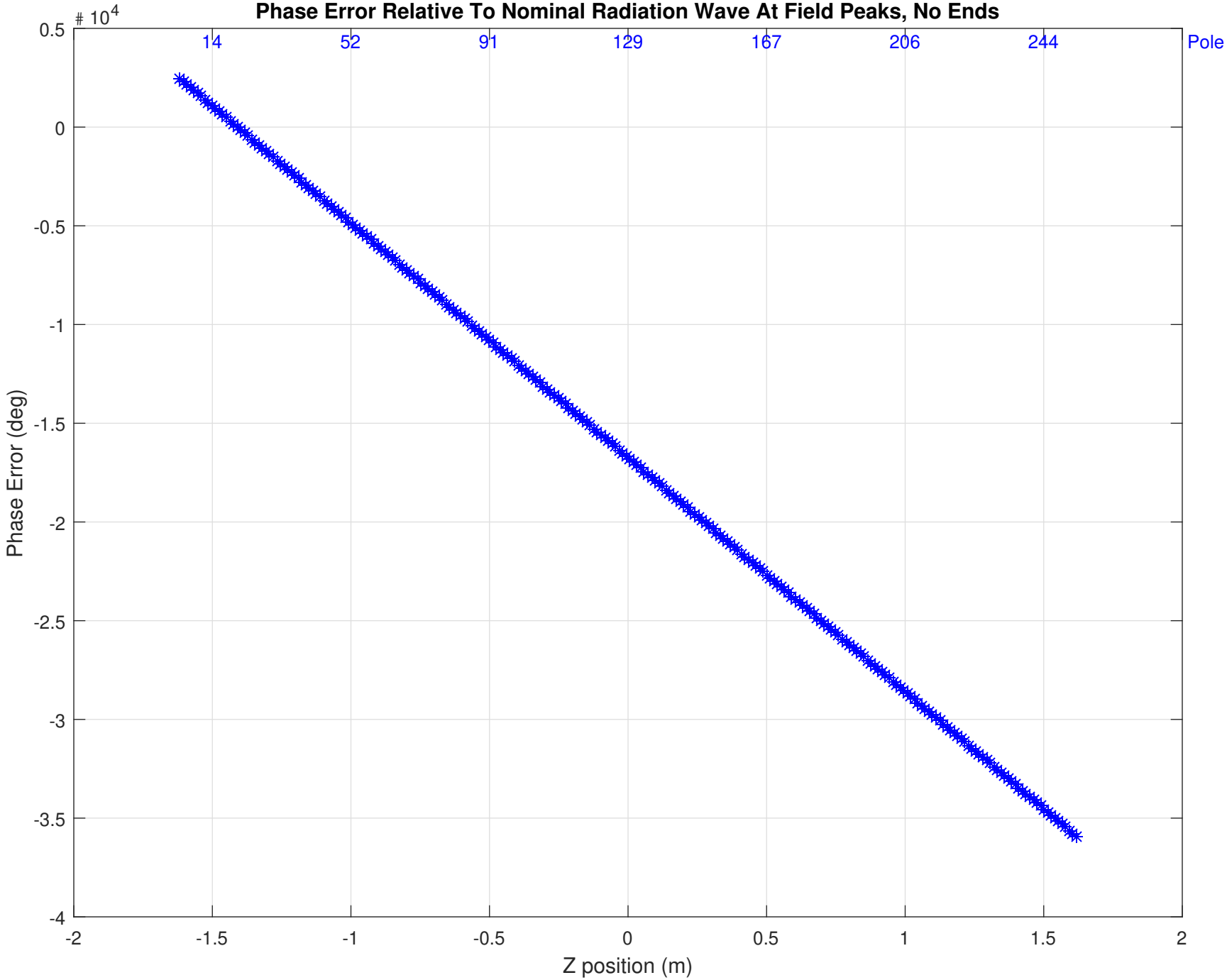

Slippage
10^-9
3
2.5
2
1.5
1
0.5
0
14
52
91
129
167
206
244
Pole
Slippage (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)


Slippage Residuals (Measured - Linear Fit) At Field Peaks, No Ends
10^-12
14
52
91
129
167
206
244
Pole
Slippage Residual (m)
Z position (m)
6
5
4
3
2
1
0
-1
-2
-3
-4
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2


Normalized Slippage
14
52
91
129
167
206
244
Pole
2.5
2
1.5
1
0.5
0
Normalized Slippage (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z position (m)



Phase Error: Ave = 0.000000 deg, RMS = 46.710333 deg


Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
10^4
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
Phase Error (deg)
14
52
91
129
167
206
244
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)