SLAC Magnetic Measurements

Planar Insertion Device Analysis

Parameters:

INPUT−FILE−DIR =C:\Magdata\Echo7 U20 Sim\Pole8 cant+1mrad\x1mm\

INPUT−FILE−NAME =ppm−und−sim.dat

INPUT−FILE−TYPE =ZBXYH

CORR−REQUIRED =0

GAMMA =233.3175

NOM−LAMBDA−U =0.02

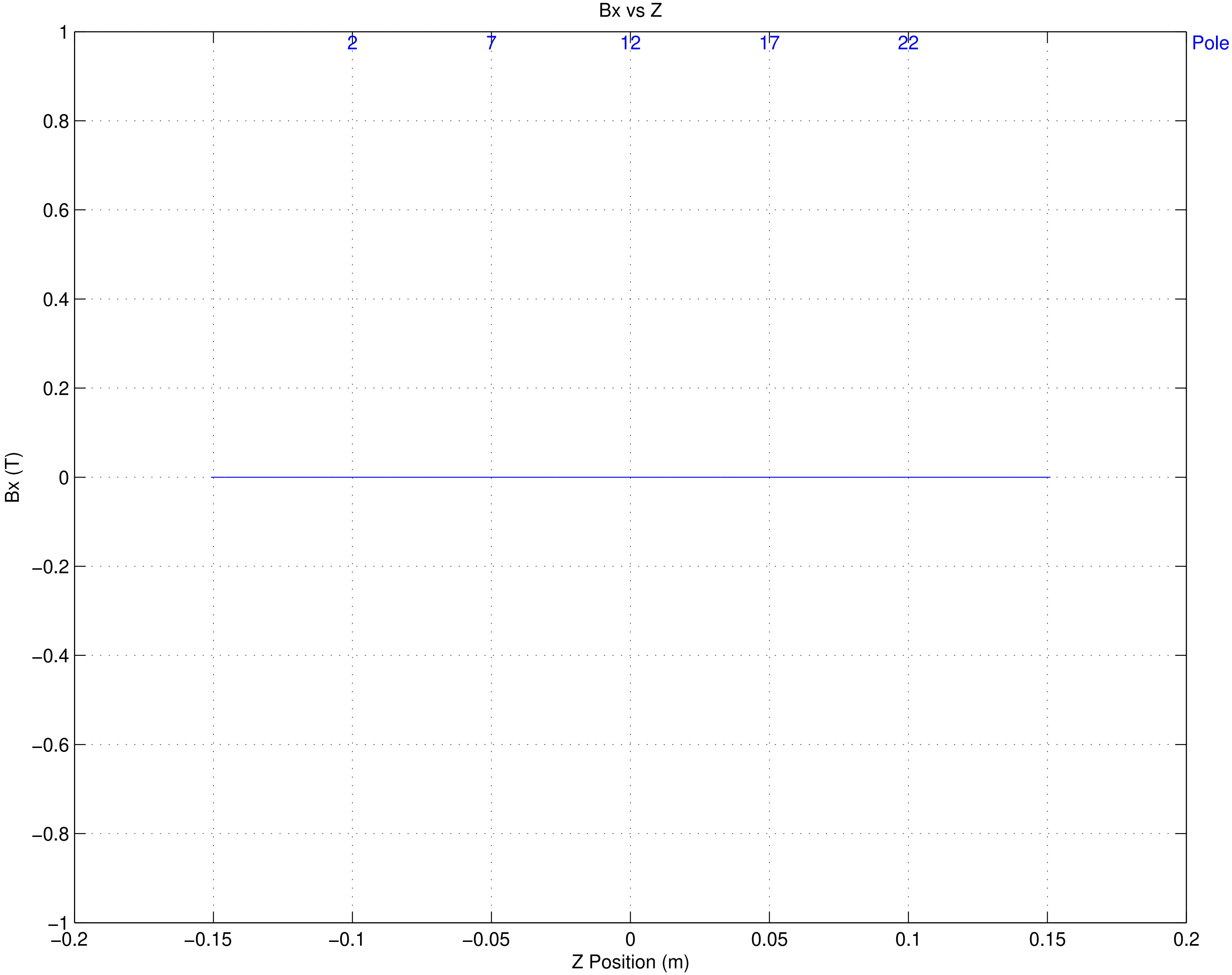
NOM−K−VALUE =1.8016

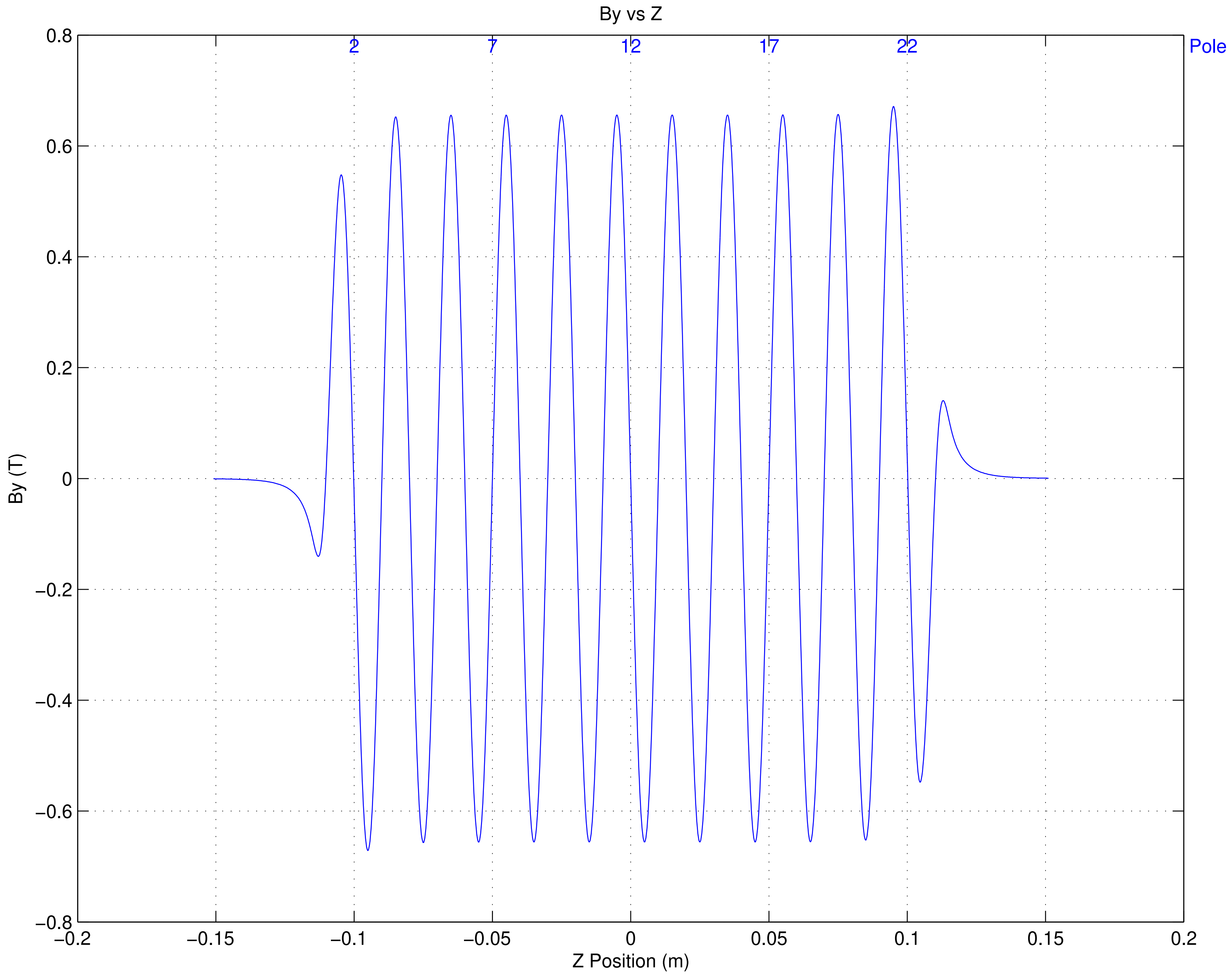
NOM−LAMBDA−R =4.8182e−007

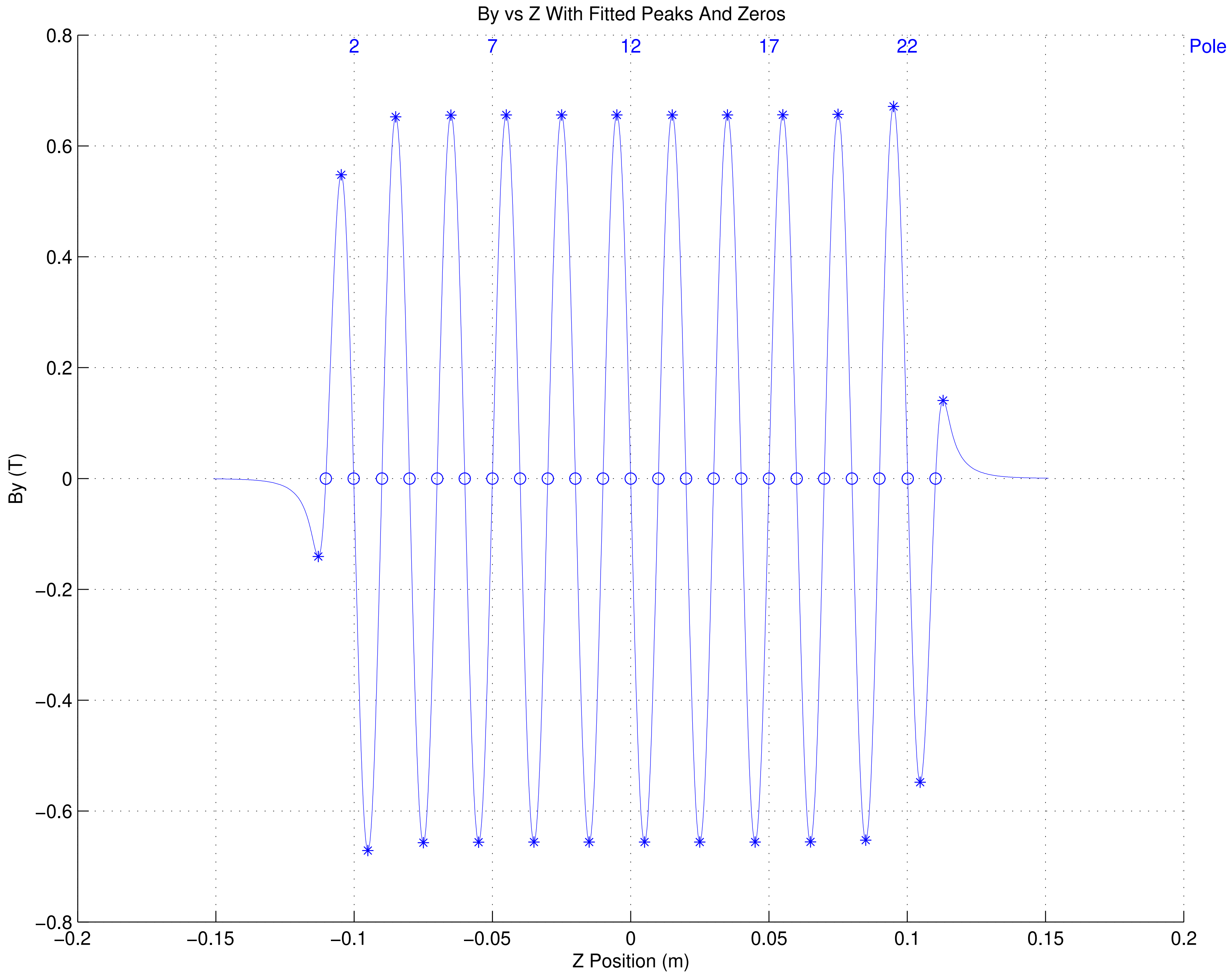
NUM−POLES =24

NUM−END−POLES =3

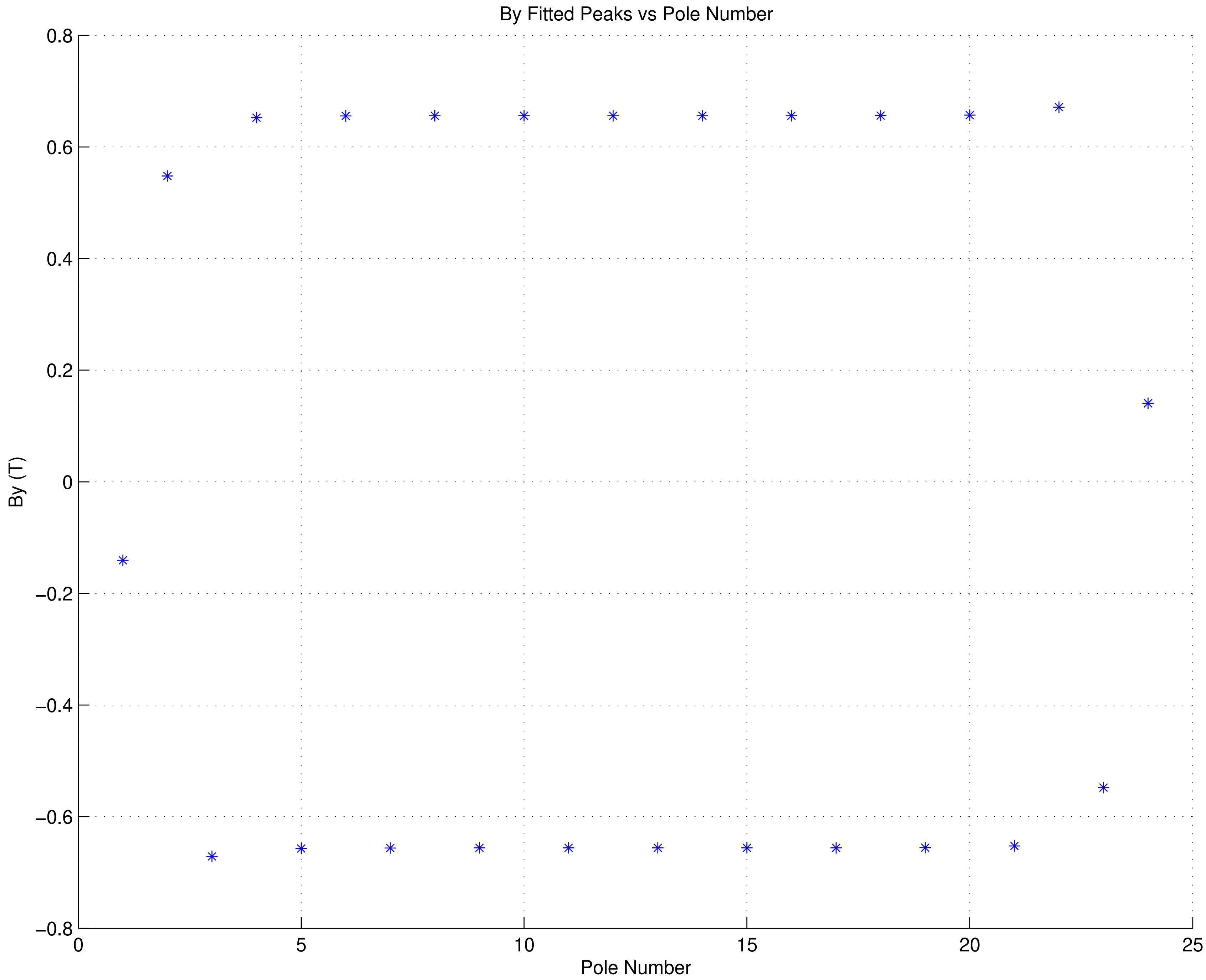
CELL−LENGTH =0.17


Bx vs Z
Pole
2
7
12
17
22
Bx (T)
Z Position (m)
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2

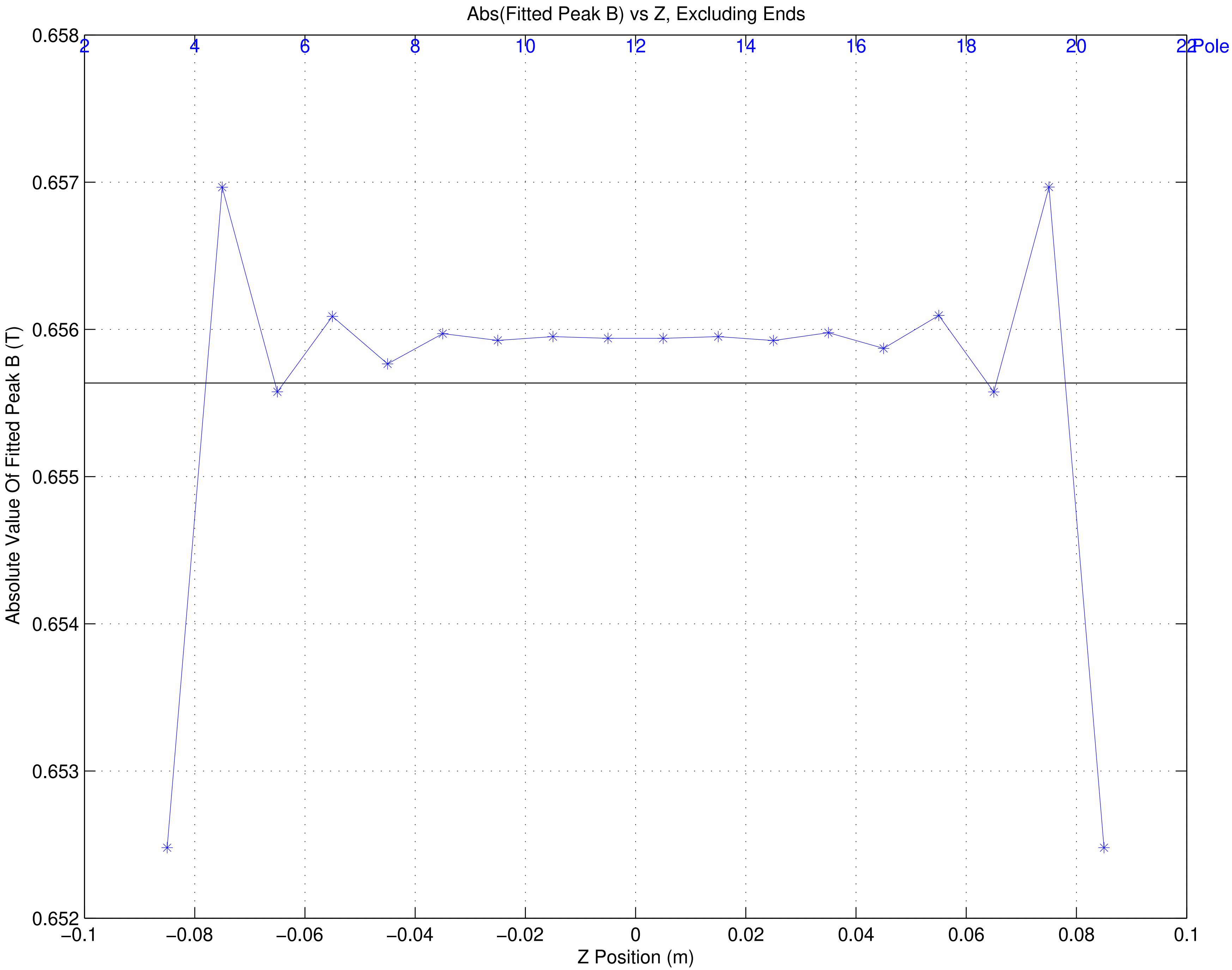

By vs Z
Pole
2
7
12
17
22
By (T)
Z Position (m)
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2



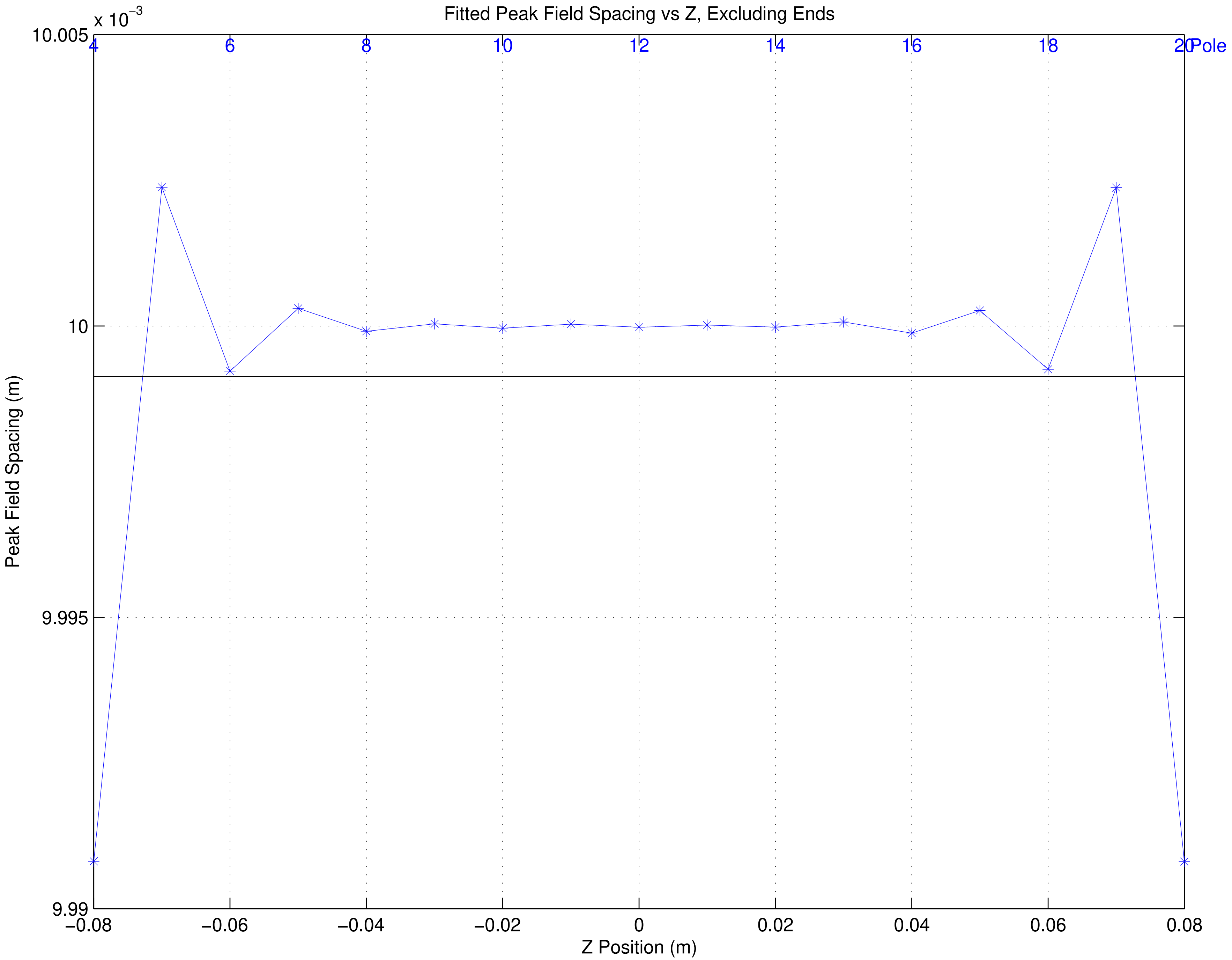
By vs Z With Fitted Peaks And Zeros
2
7
12
17
22
Pole
By (T)
Z Position (m)
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2



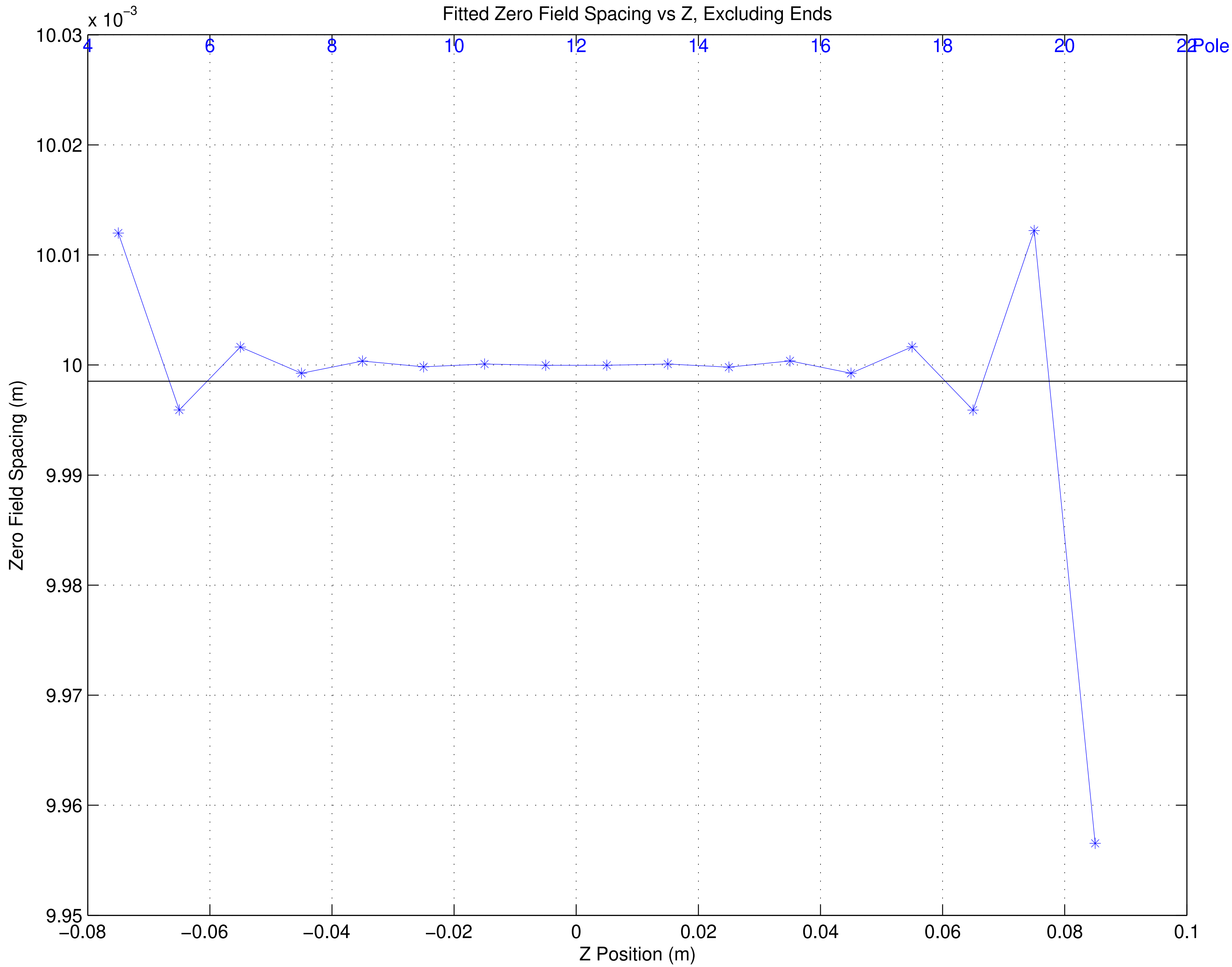
By Fitted Peaks vs Pole Number
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
By (T)
0
5
10
15
20
25
Pole Number



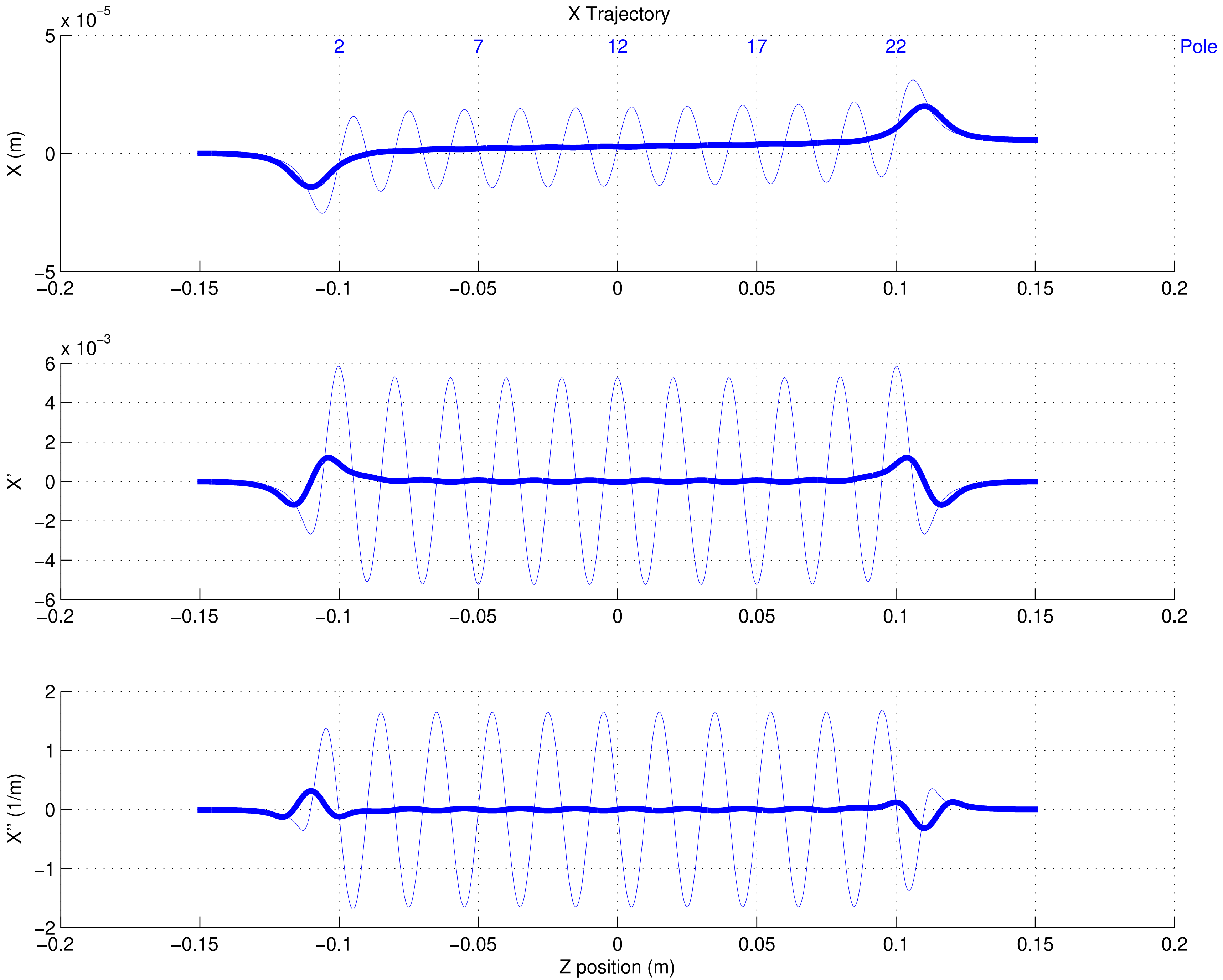
Peak Fields: Ave = 0.655635 T, RMS = 0.001206 T



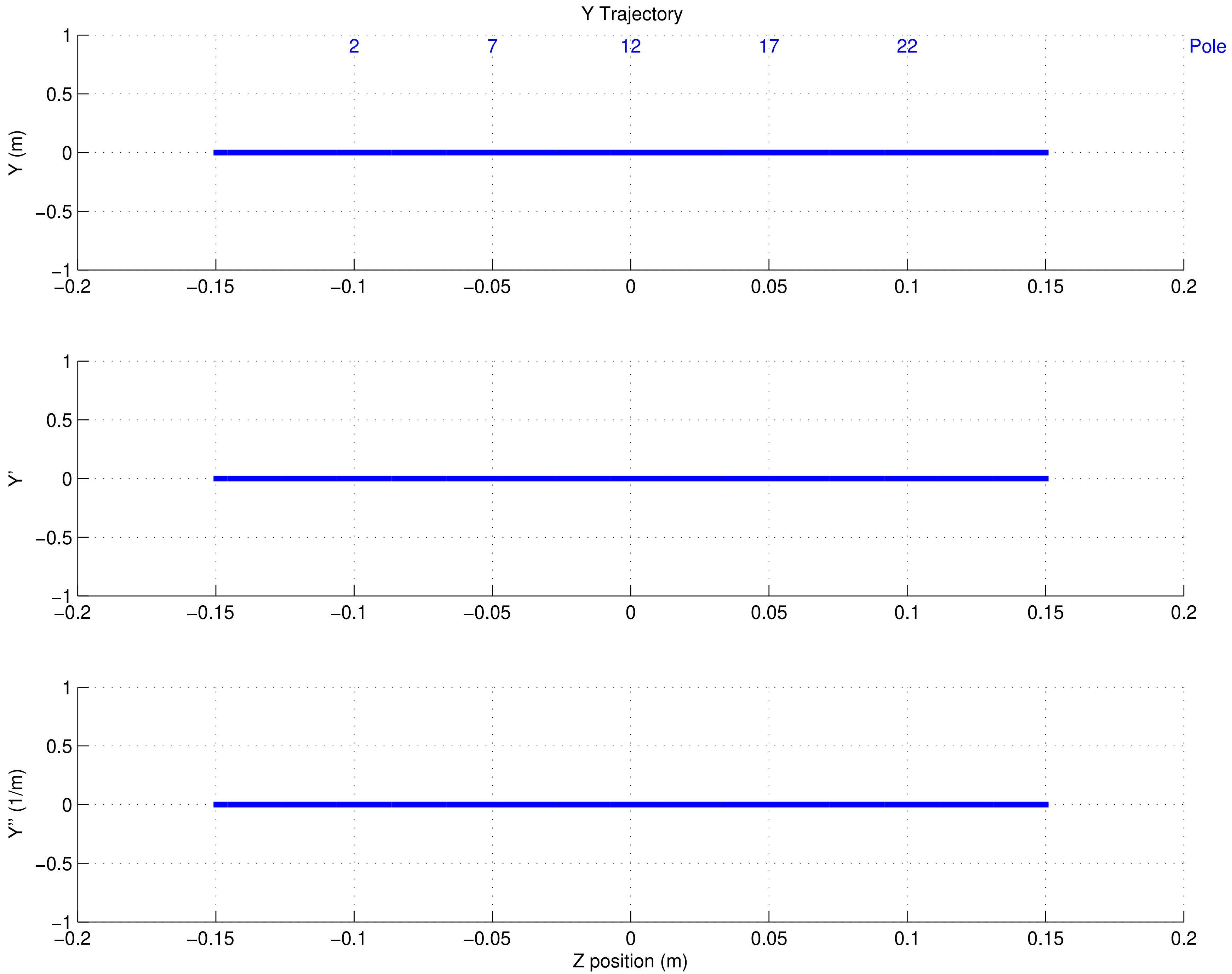
Peak Field Spacing: Ave = 0.009999 m, RMS = 0.000003 m



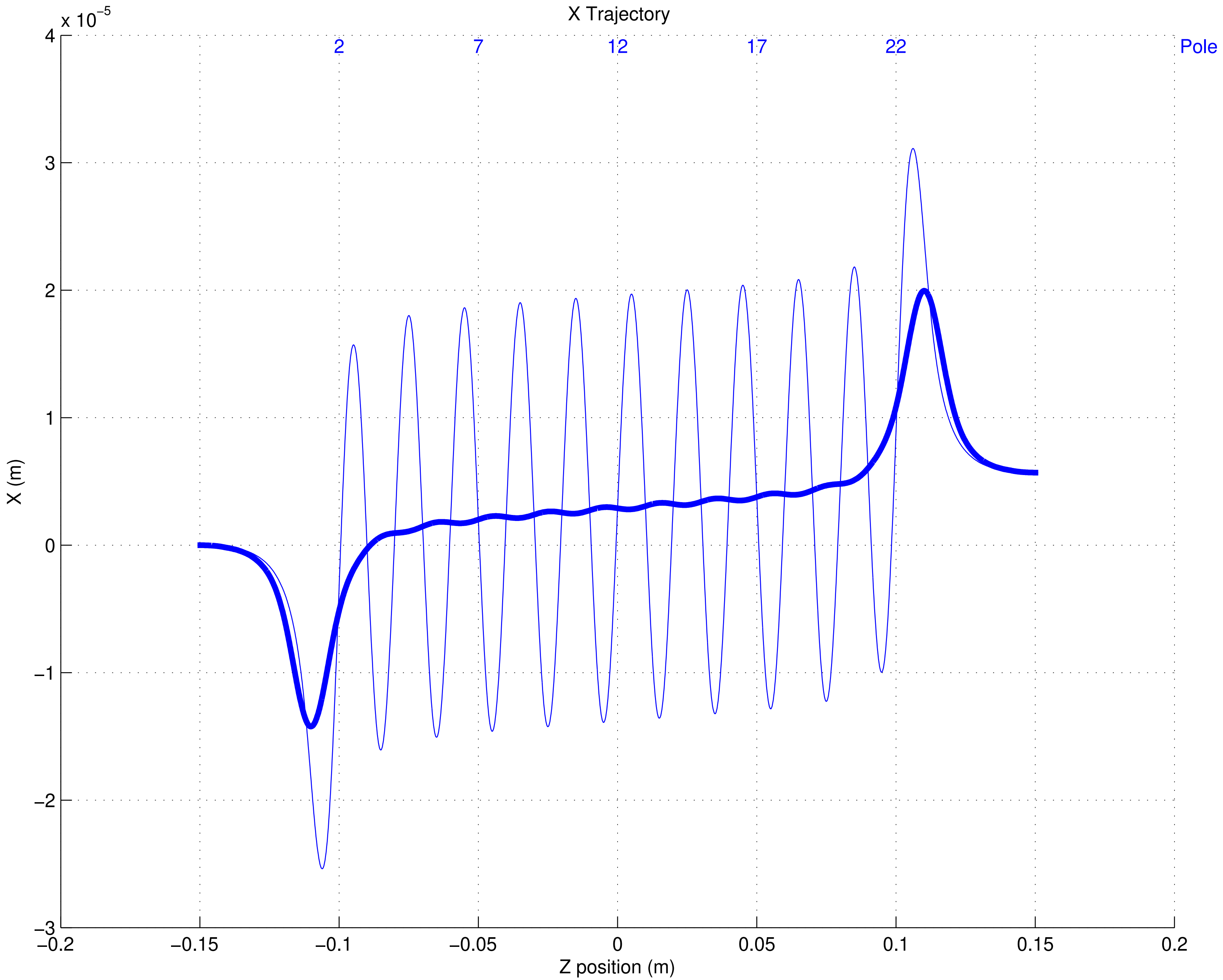
Zero Field Spacing: Ave = 0.009999 m, RMS = 0.000012 m



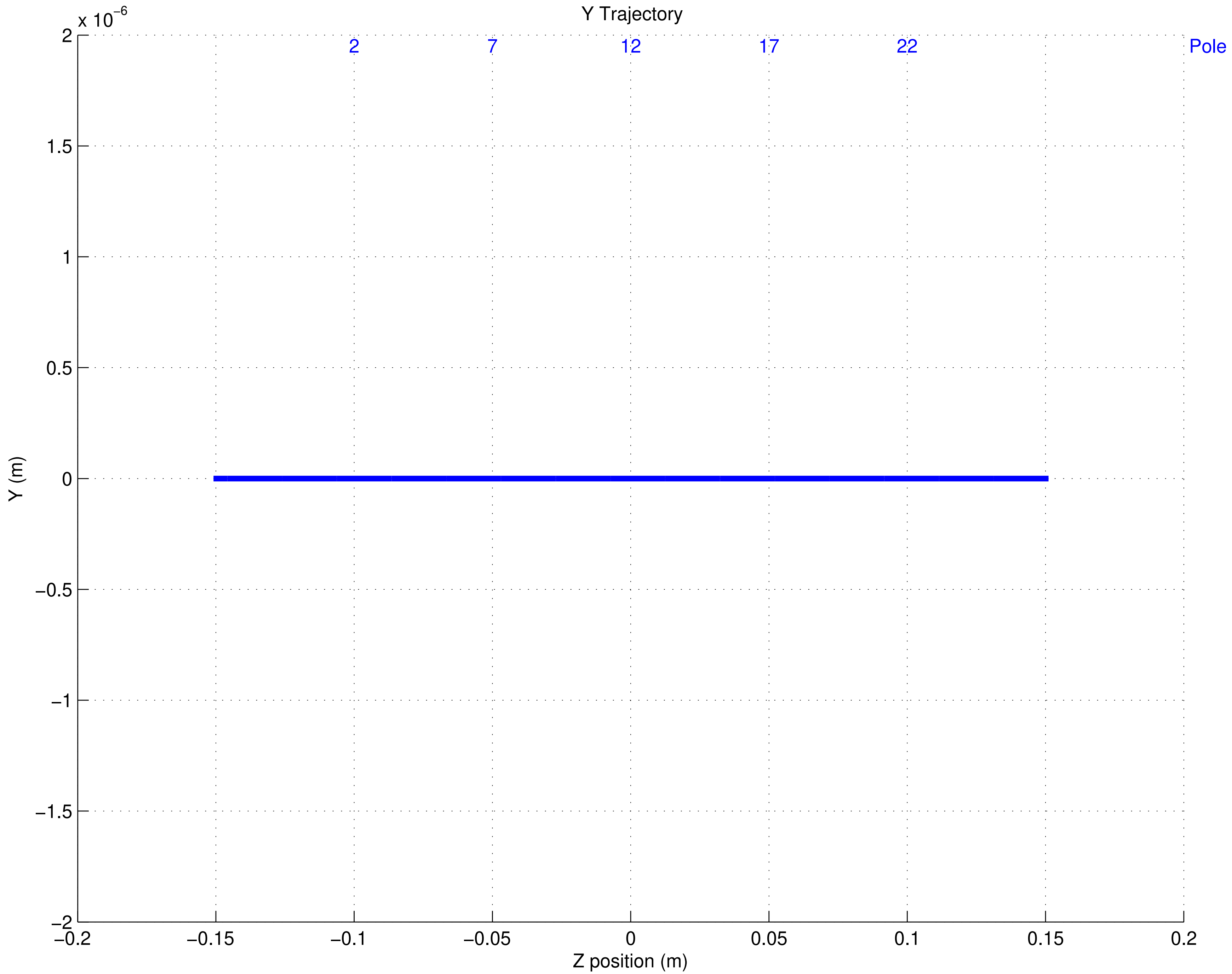
X Trajectory
x 10^-5
5
0
−5
X (m)
2
7
12
17
22
Pole
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2
x 10^-3
6
4
2
0
−2
−4
−6
X'
2
1
0
−1
−2
X'' (1/m)
Z position (m)



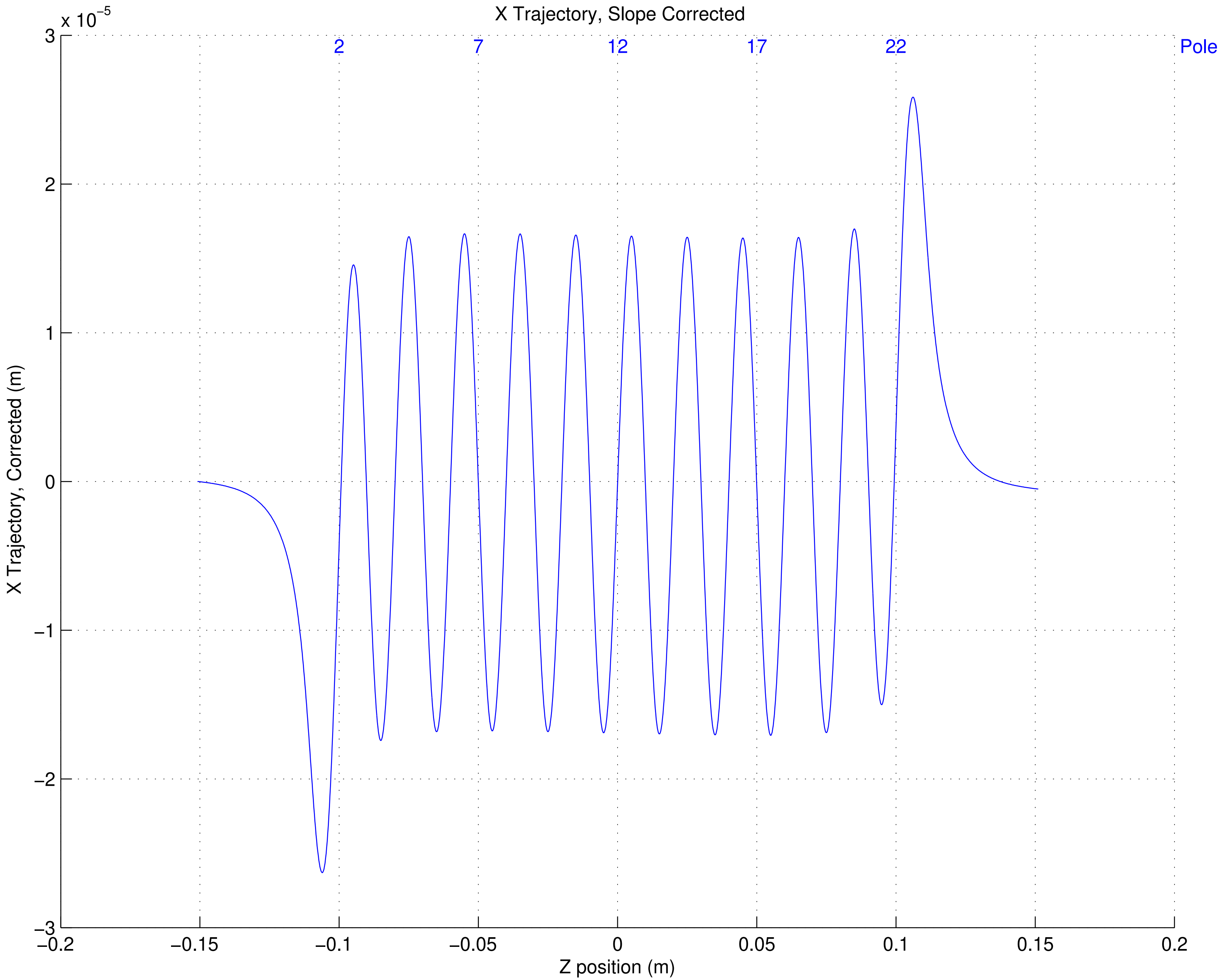
Y Trajectory
2
7
12
17
22
Pole
Y (m)
Y'
Y'' (1/m)
1
0.5
0
−0.5
−1
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2
Z position (m)

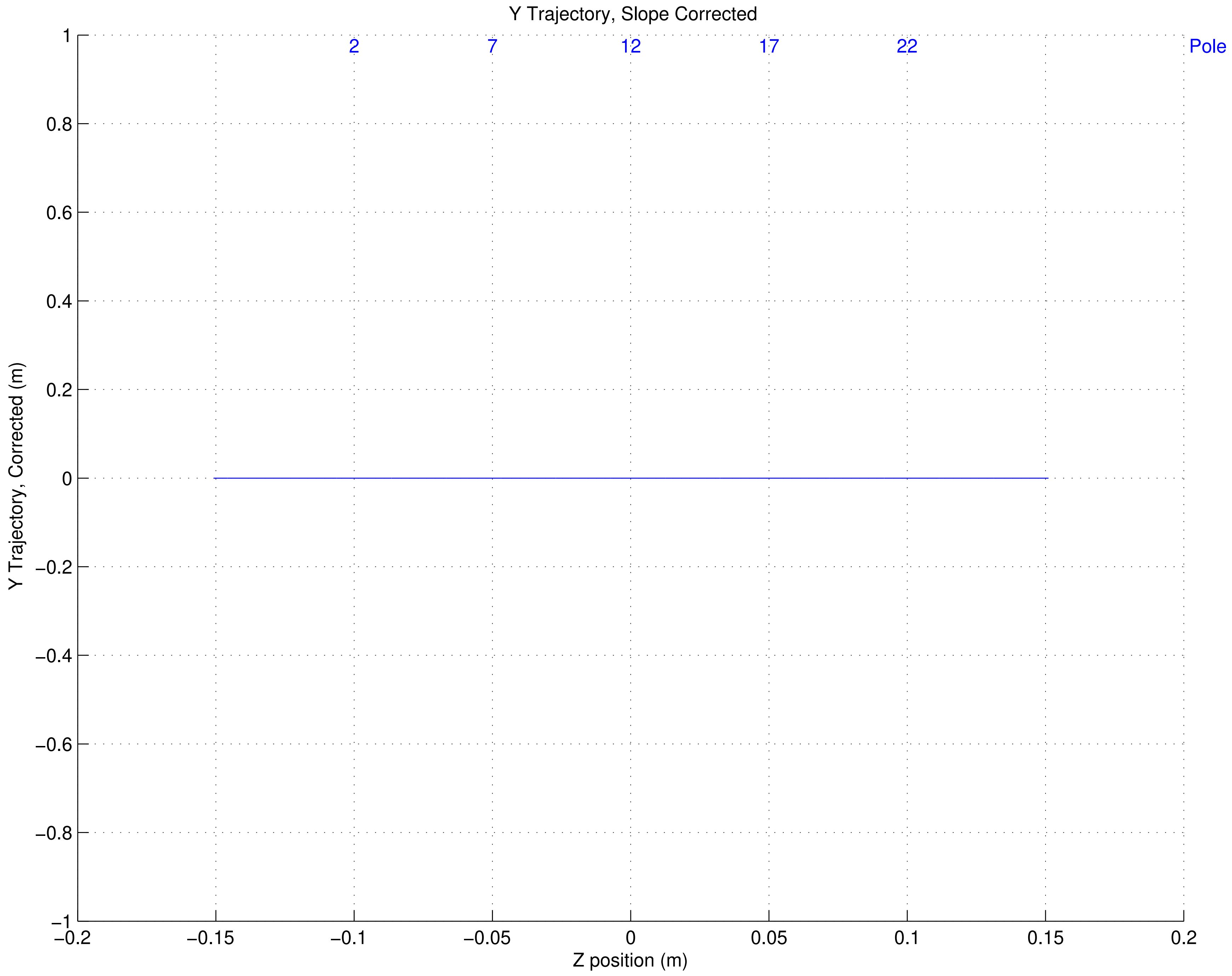


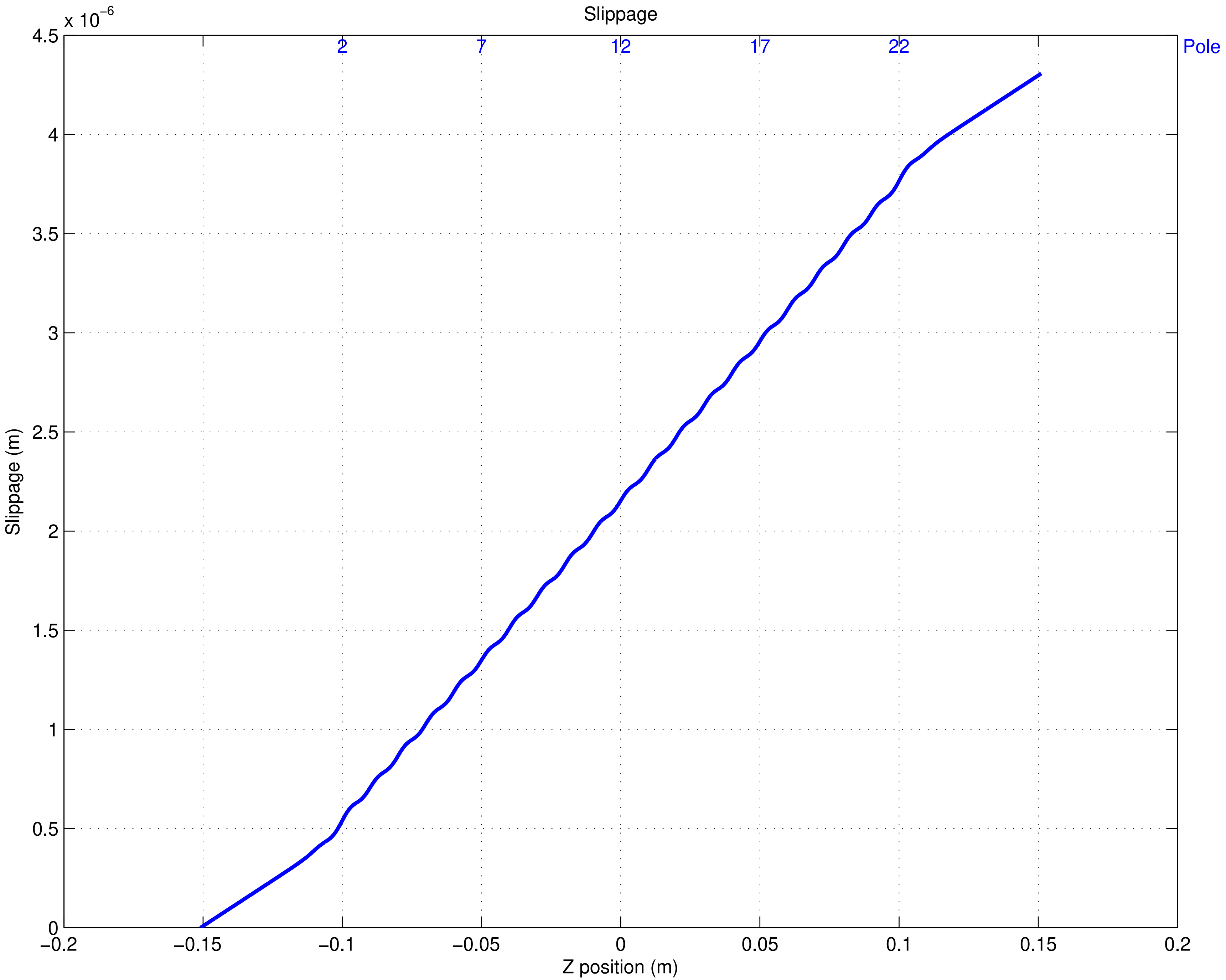
X Trajectory
x 10^−5
4
3
2
1
0
−1
−2
−3
X (m)
2
7
12
17
22
Pole
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2
Z position (m)



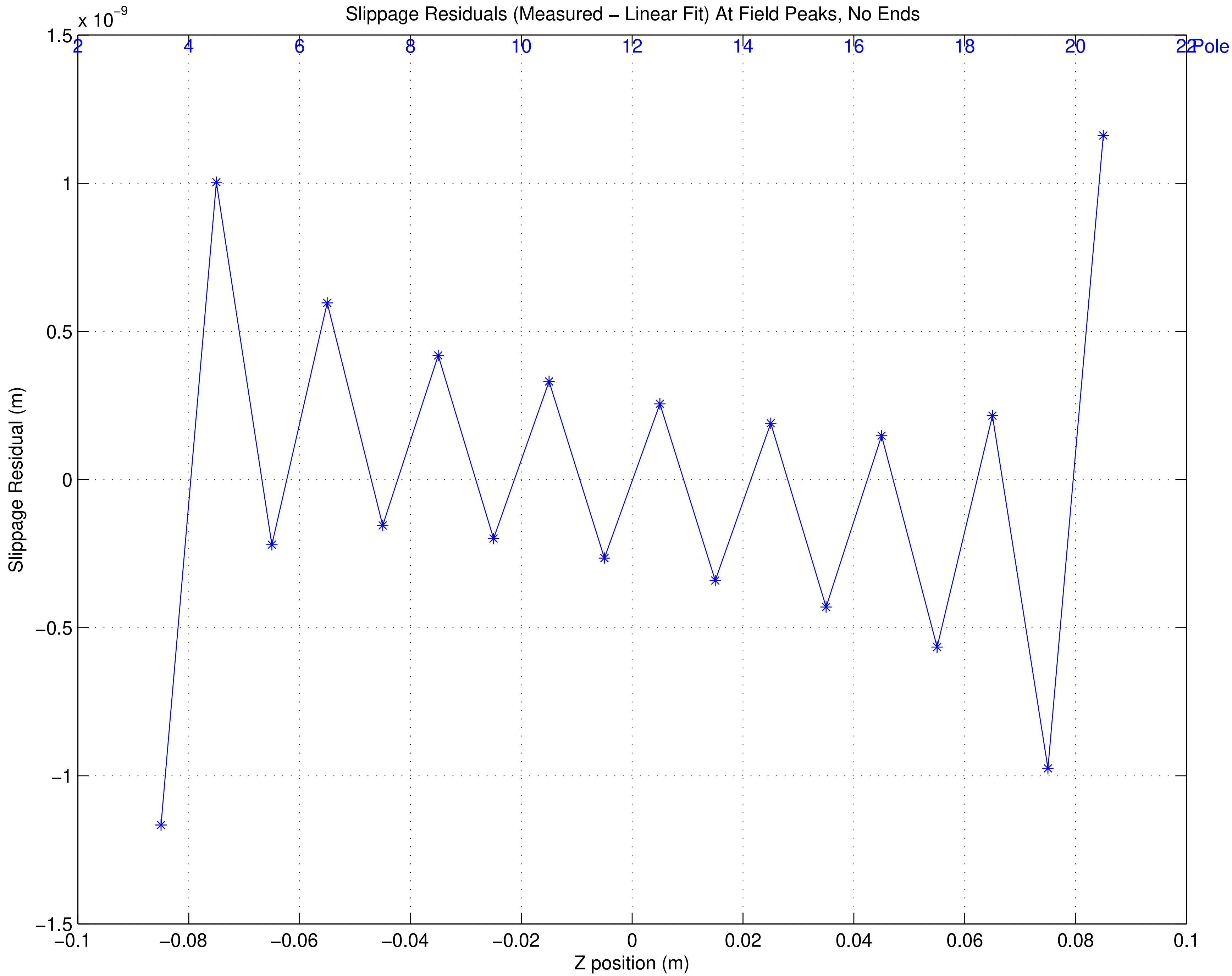
Y Trajectory
x 10^-6
2
1.5
1
0.5
0
–0.5
–1
–1.5
–2
Y (m)
–0.2
–0.15
–0.1
–0.05
0
0.05
0.1
0.15
0.2
Z position (m)
2
7
12
17
22
Pole


X Trajectory, Slope Corrected
x 10^-5
3
2
1
0
–1
–2
–3
X Trajectory, Corrected (m)
2
7
12
17
22
Pole
–0.2
–0.15
–0.1
–0.05
0
0.05
0.1
0.15
0.2
Z position (m)

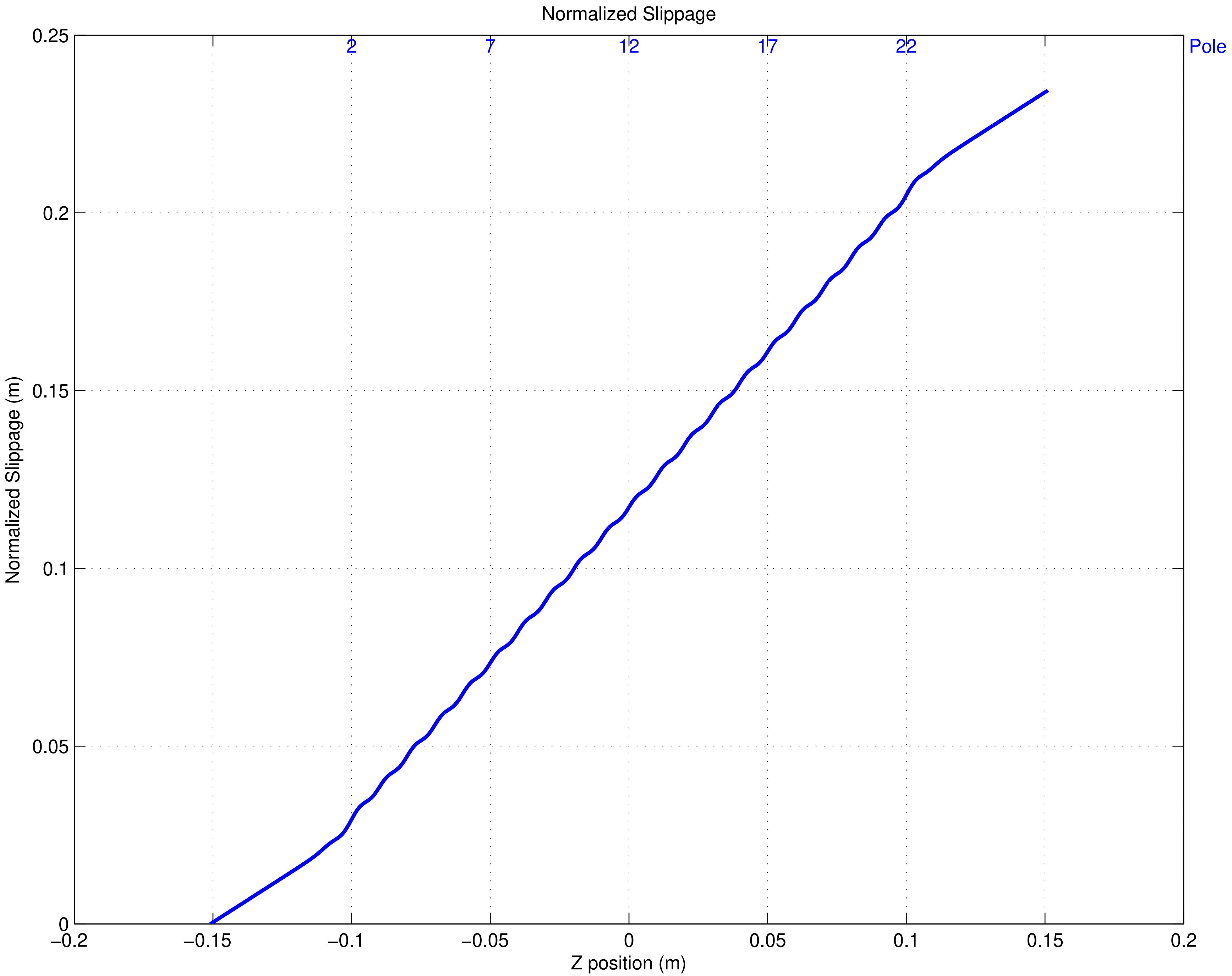

Y Trajectory, Slope Corrected
2
7
12
17
22
Pole
Y Trajectory, Corrected (m)
Z position (m)
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2



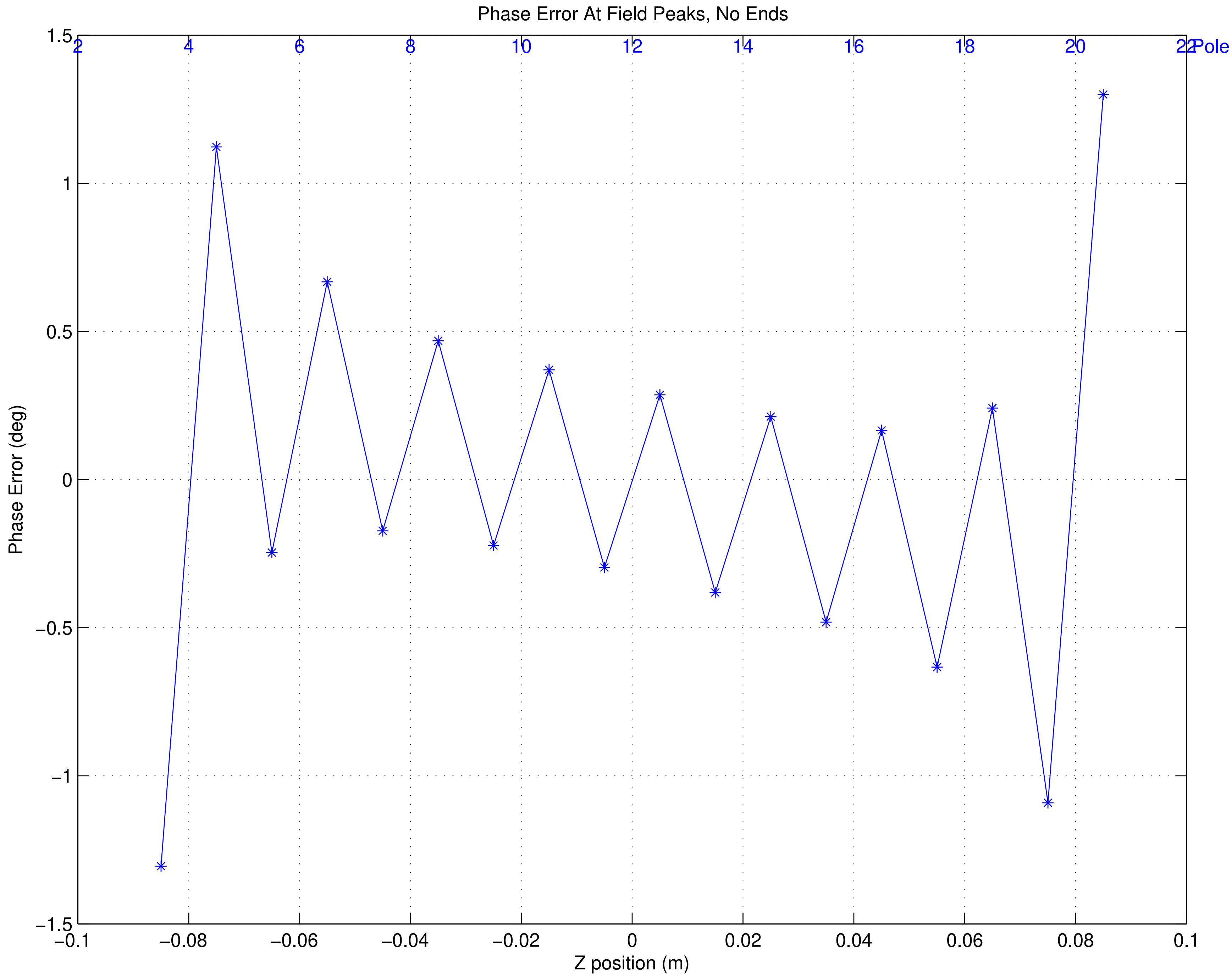
Slippage
x 10^-6
Pole
2
7
12
17
22
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Slippage (m)
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2
Z position (m)



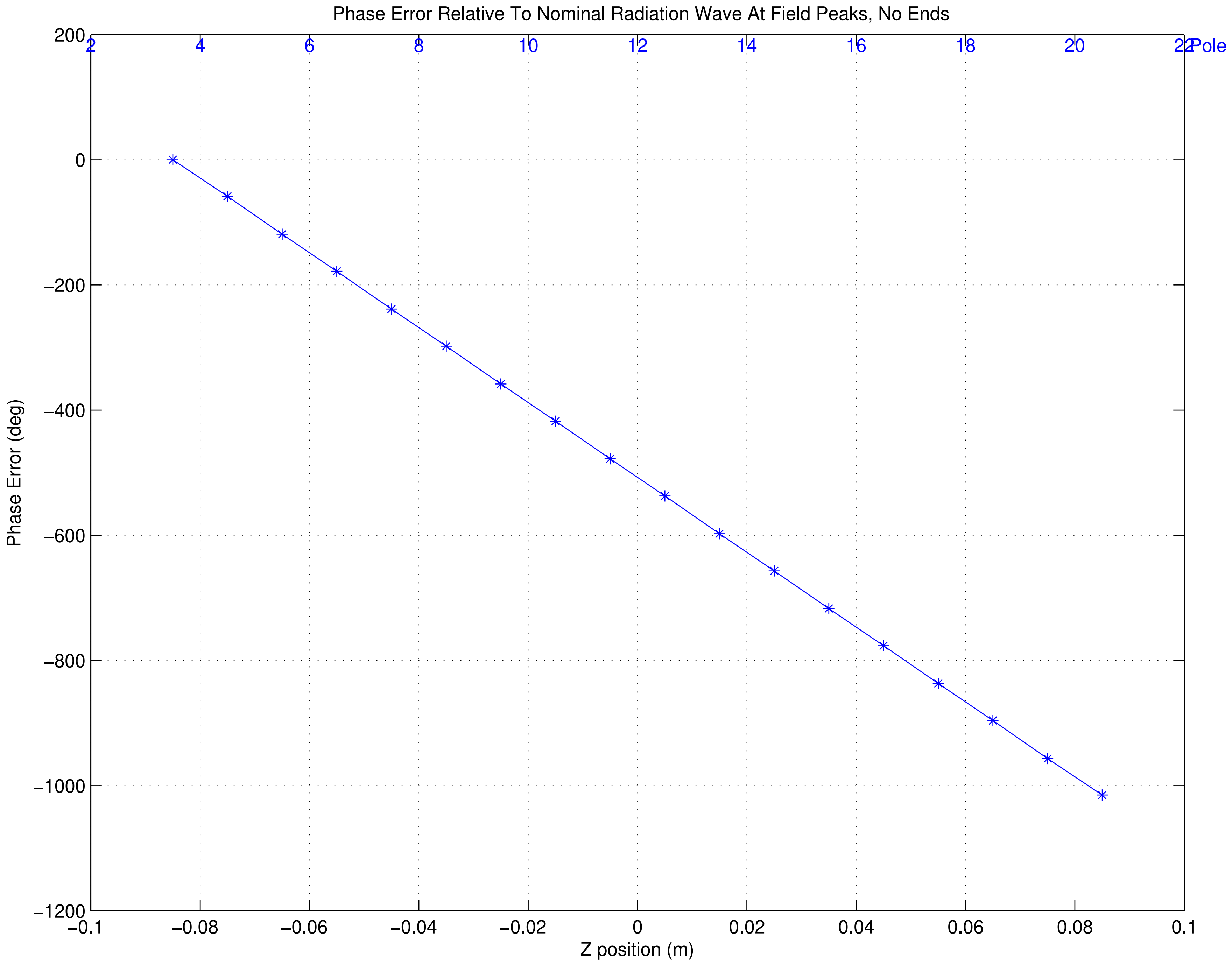
Slippage Residuals (Measured – Linear Fit) At Field Peaks, No Ends
x 10^−9
1.5
1
0.5
0
−0.5
−1
−1.5
2
4
6
8
10
12
14
16
18
20
22
Pole
−0.1
−0.08
−0.06
−0.04
−0.02
0
0.02
0.04
0.06
0.08
0.1
Z position (m)
Slippage Residual (m)



Normalized Slippage
Normalized Slippage (m)
Z position (m)
Pole
2
7
12
17
22
0.25
0.2
0.15
0.1
0.05
0
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2



Phase Error: Ave = −0.000000 deg, RMS = 0.680232 deg



Phase Error Relative To Nominal Radiation Wave At Field Peaks, No Ends
Phase Error (deg)
Z position (m)
Pole
200
0
−200
−400
−600
−800
−1000
−1200
−0.1
−0.08
−0.06
−0.04
−0.02
0
0.02
0.04
0.06
0.08
0.1
2
4
6
8
10
12
14
16
18
20
22