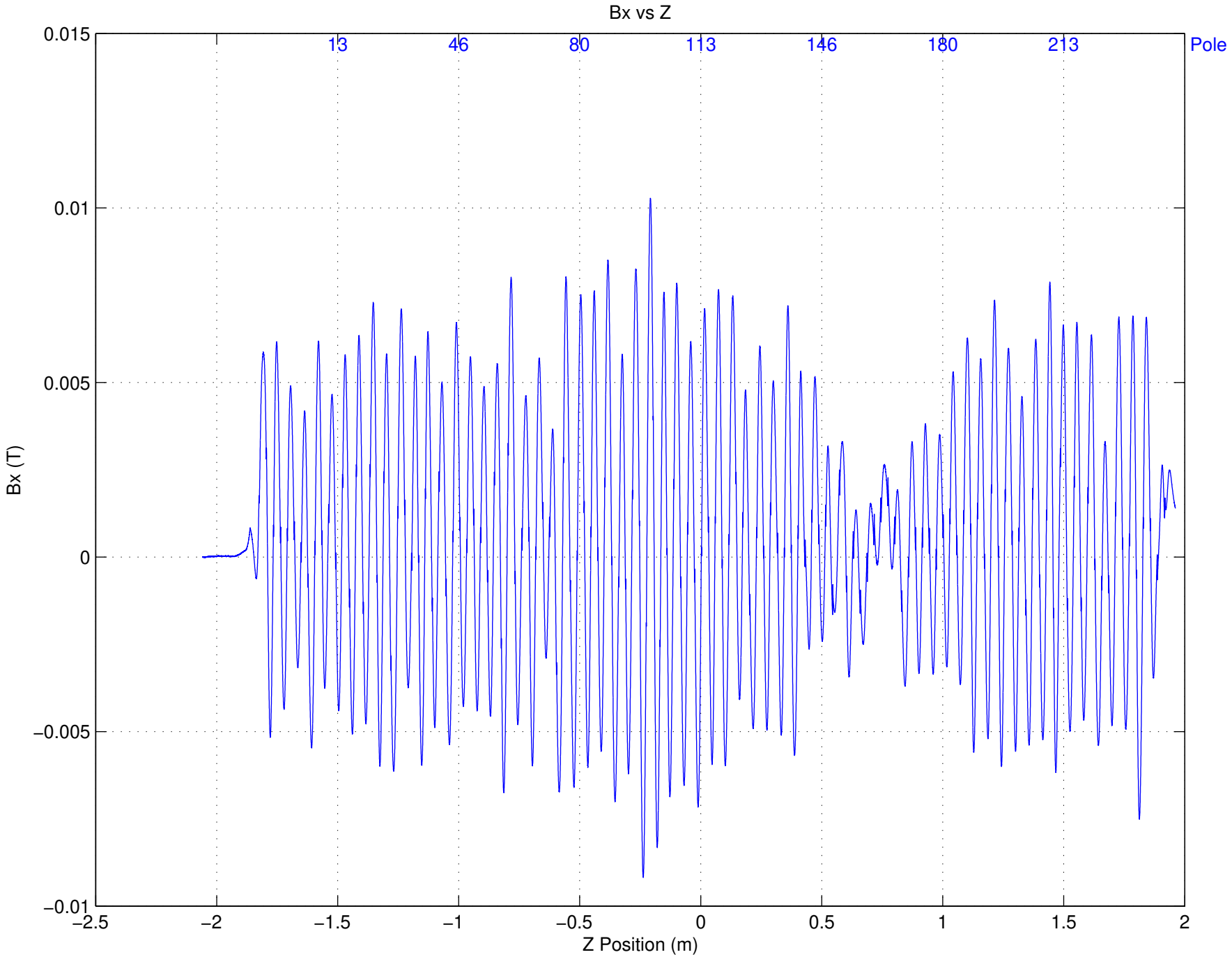
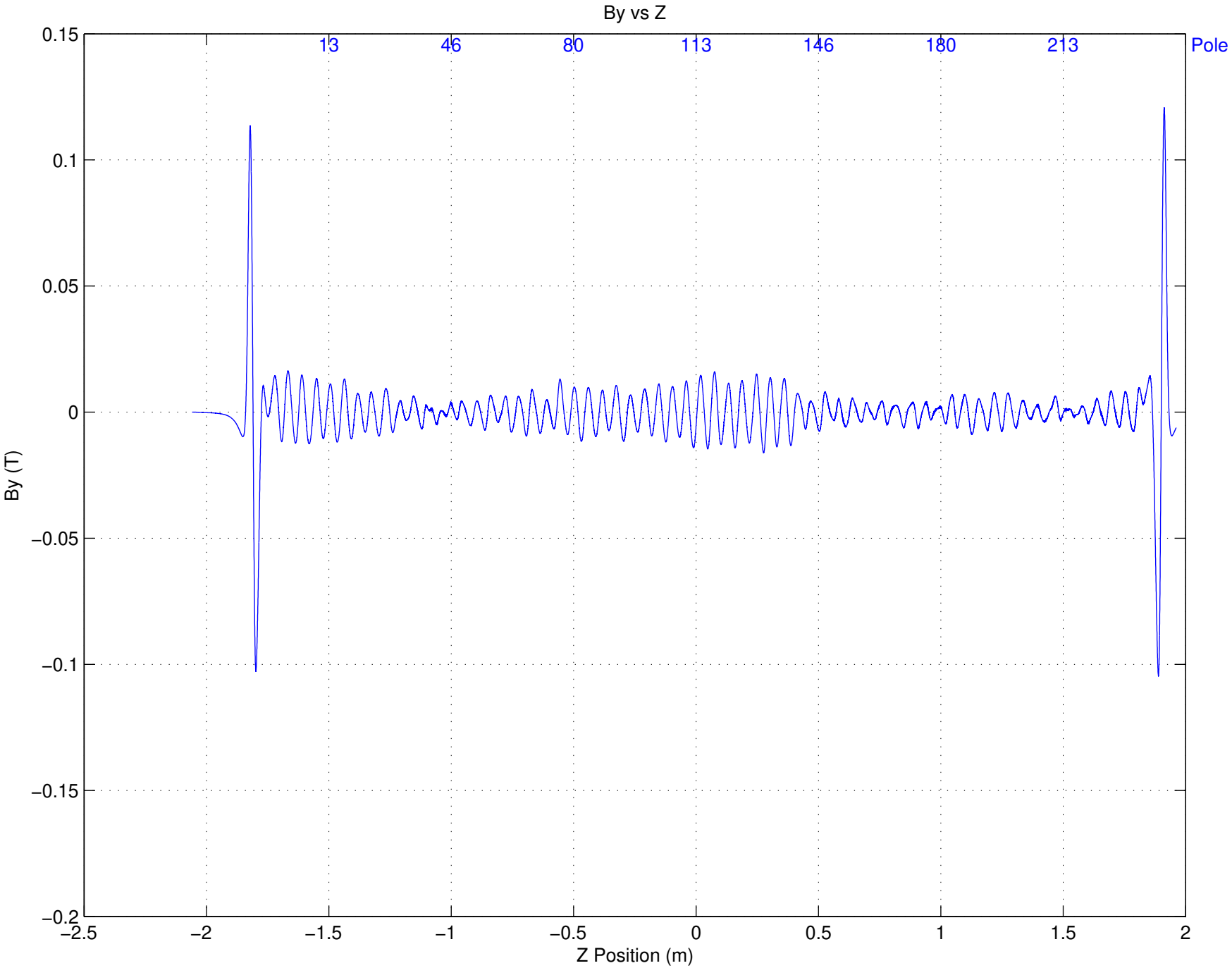
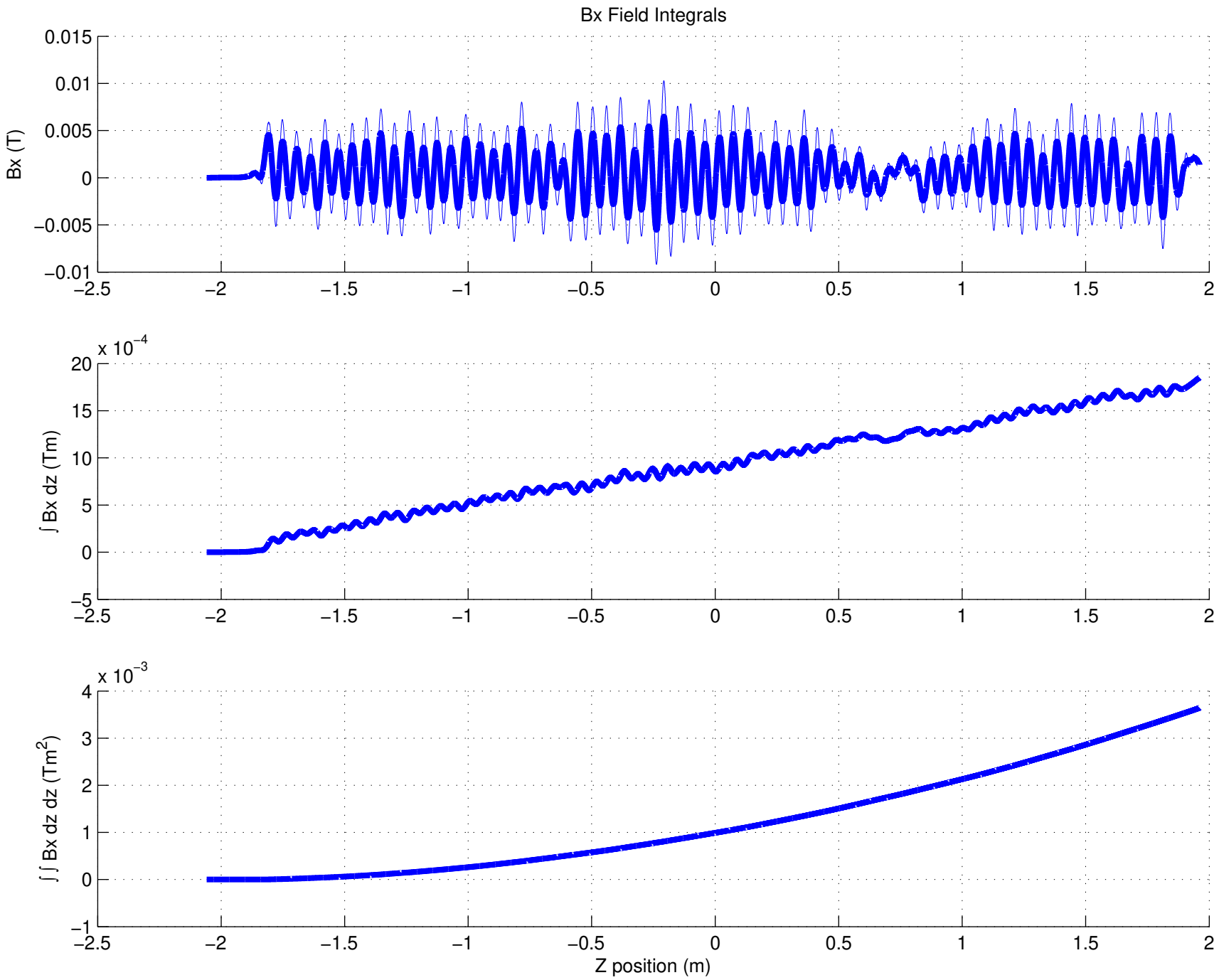
SLAC Magnetic Measurements

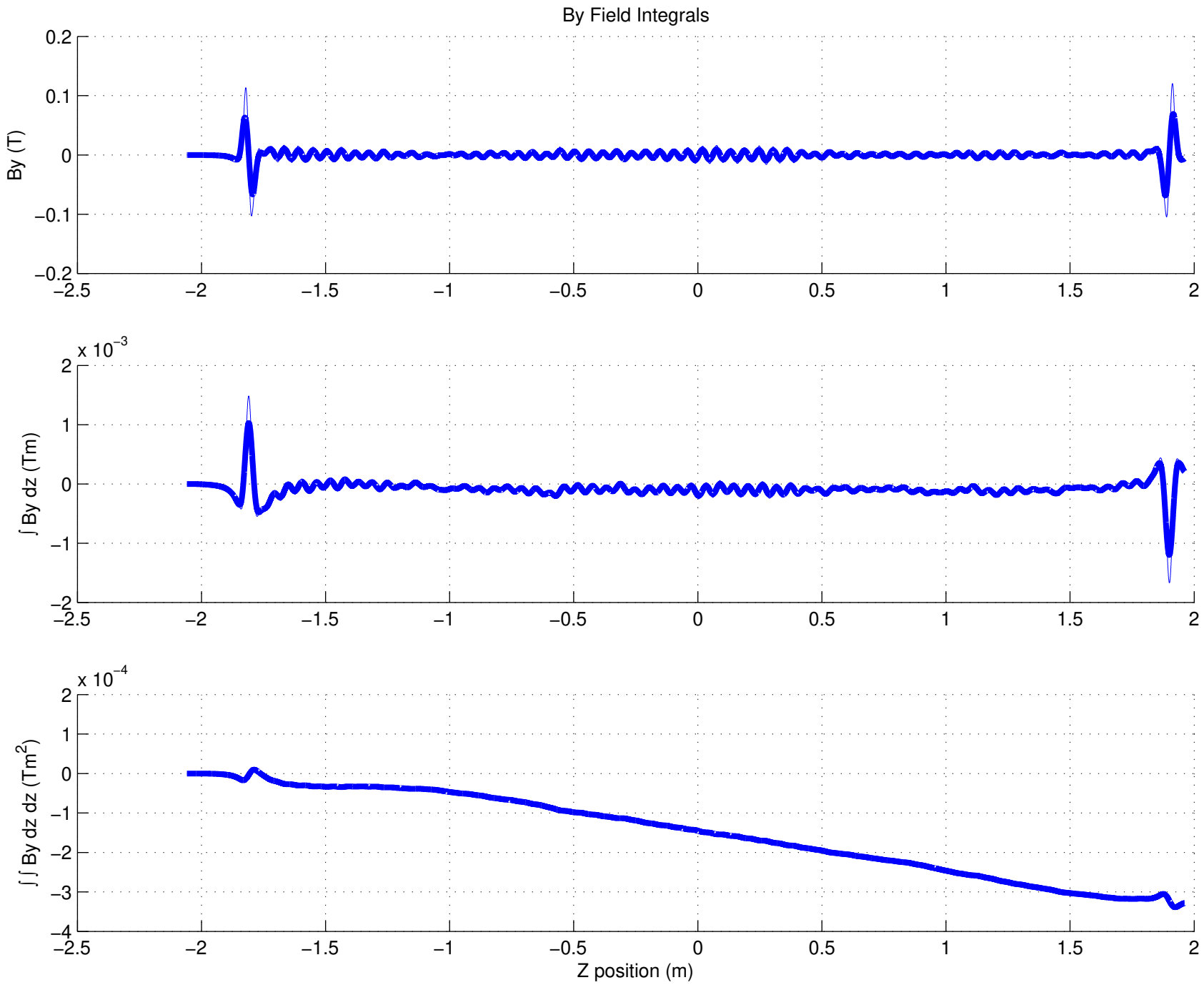
Trajectory Analysis

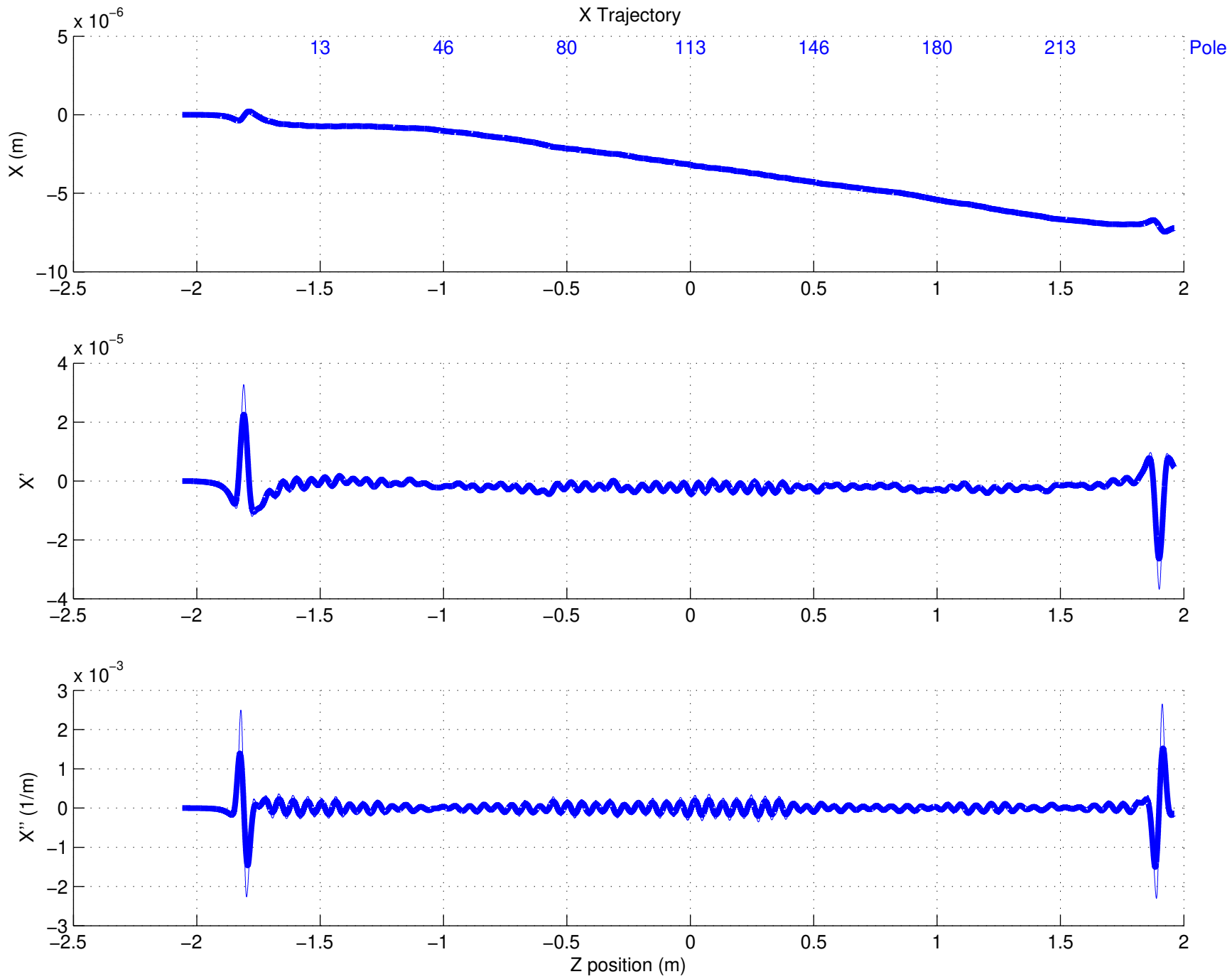
Parameters:
INPUT−FILE−DIR =S:\MagData\LCLS\Undulator\EPU\DATASET0001\Rough Tuning\Z Scans\Run 181\
INPUT−FILE−NAME =x+00000−y+000−bscanz.dat
INPUT−FILE−TYPE =ZVXYBXYH
GAMMA =26693
NOM−ZM−PROBE−AT−DEV−CTR =2.0589
NOM−LAMBDA−U =0.03
NUM−POLES =226
NOM−LAMBDA−R =1.5e−010

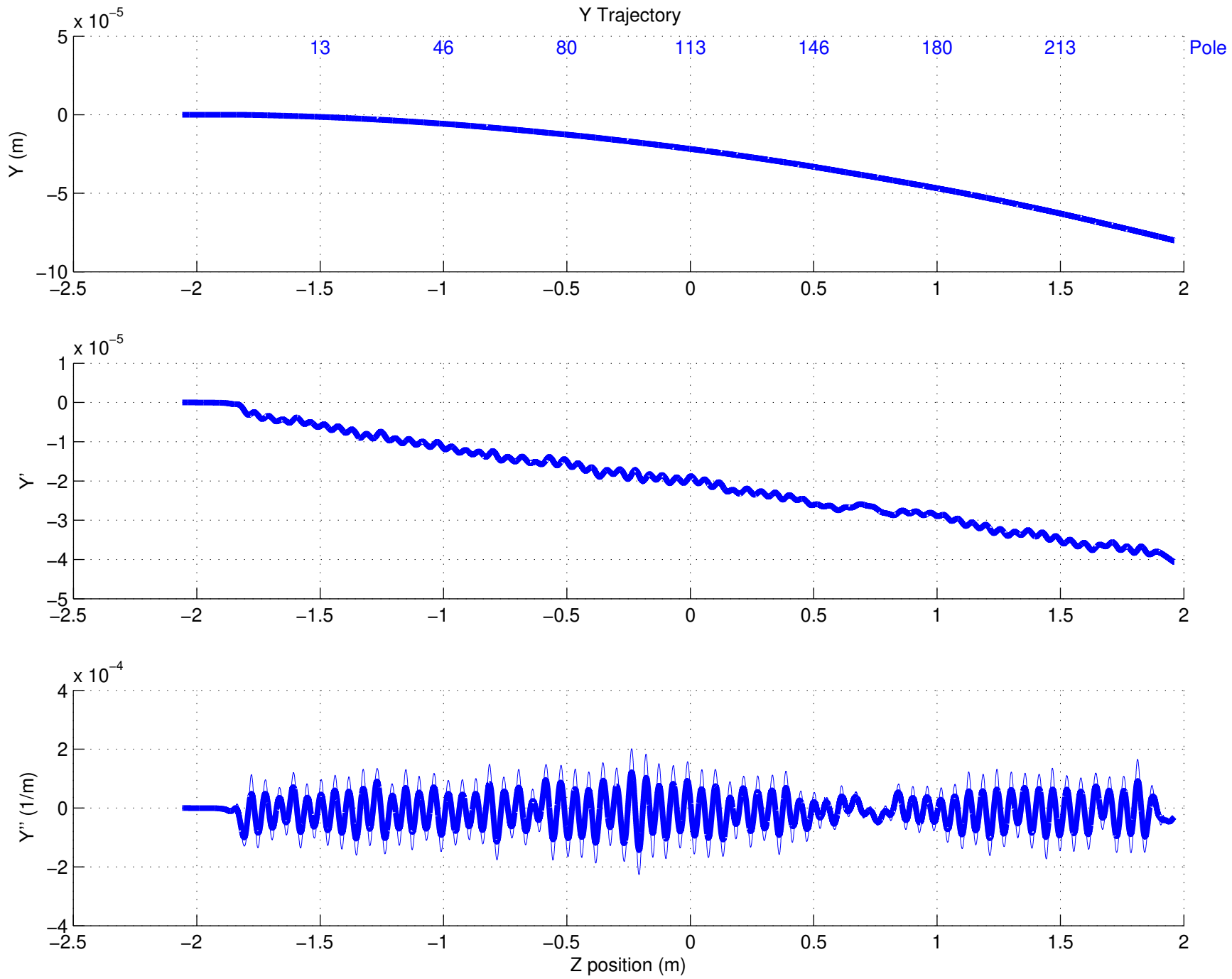

Bx vs Z
13
46
80
113
146
180
213
Pole
0.015
0.01
0.005
0
−0.005
−0.01
Bx (T)
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z Position (m)

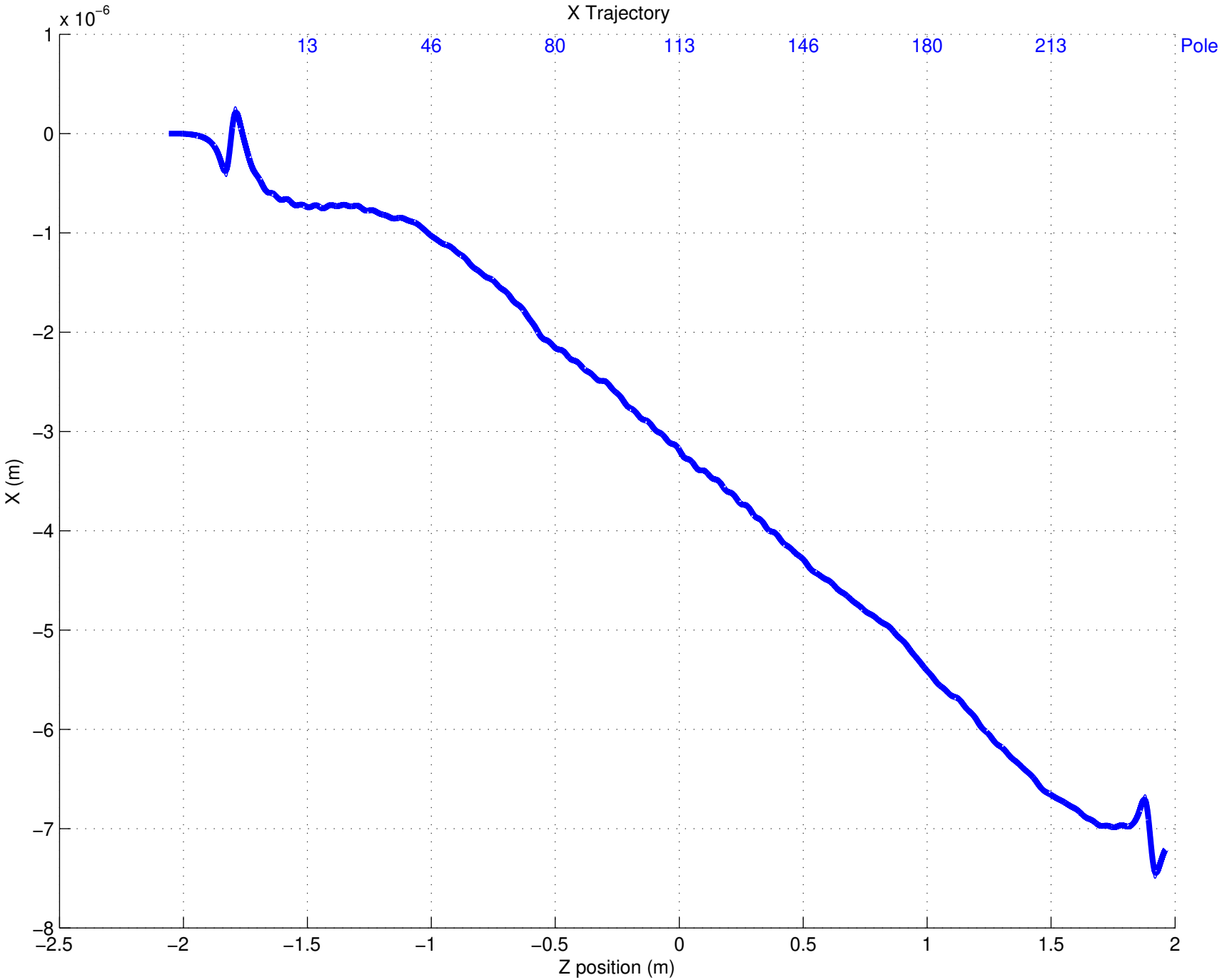

By vs Z
13
46
80
113
146
180
213
Pole
0.15
0.1
0.05
0
−0.05
−0.1
−0.15
−0.2
By (T)
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z Position (m)

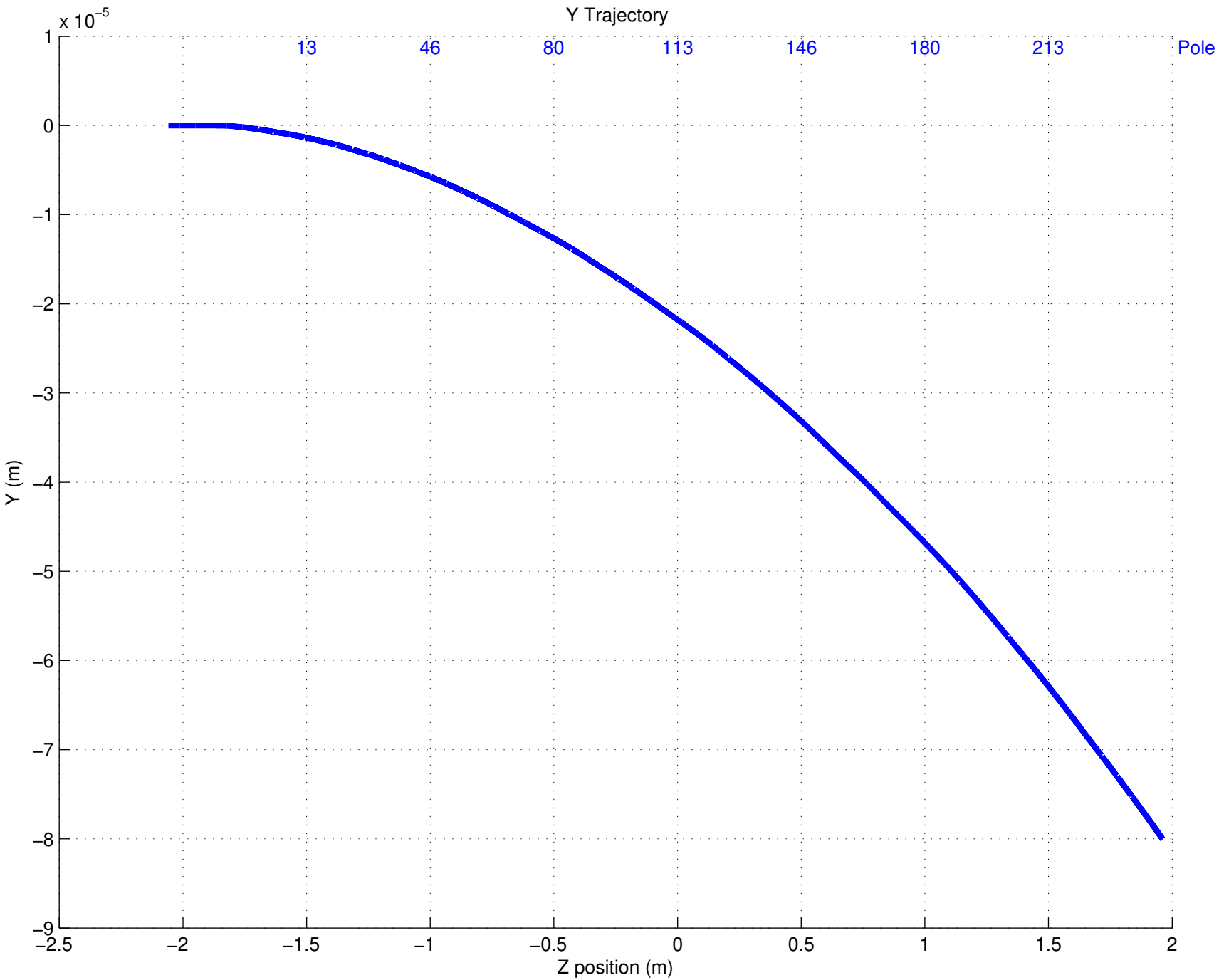

Bx Field Integrals
Bx (T)
0.015
0.01
0.005
0
−0.005
−0.01
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
x 10^−4
∫ Bx dz (Tm)
20
15
10
5
0
−5
x 10^−3
∫ ∫ Bx dz dz (Tm^2)
4
3
2
1
0
−1
Z position (m)

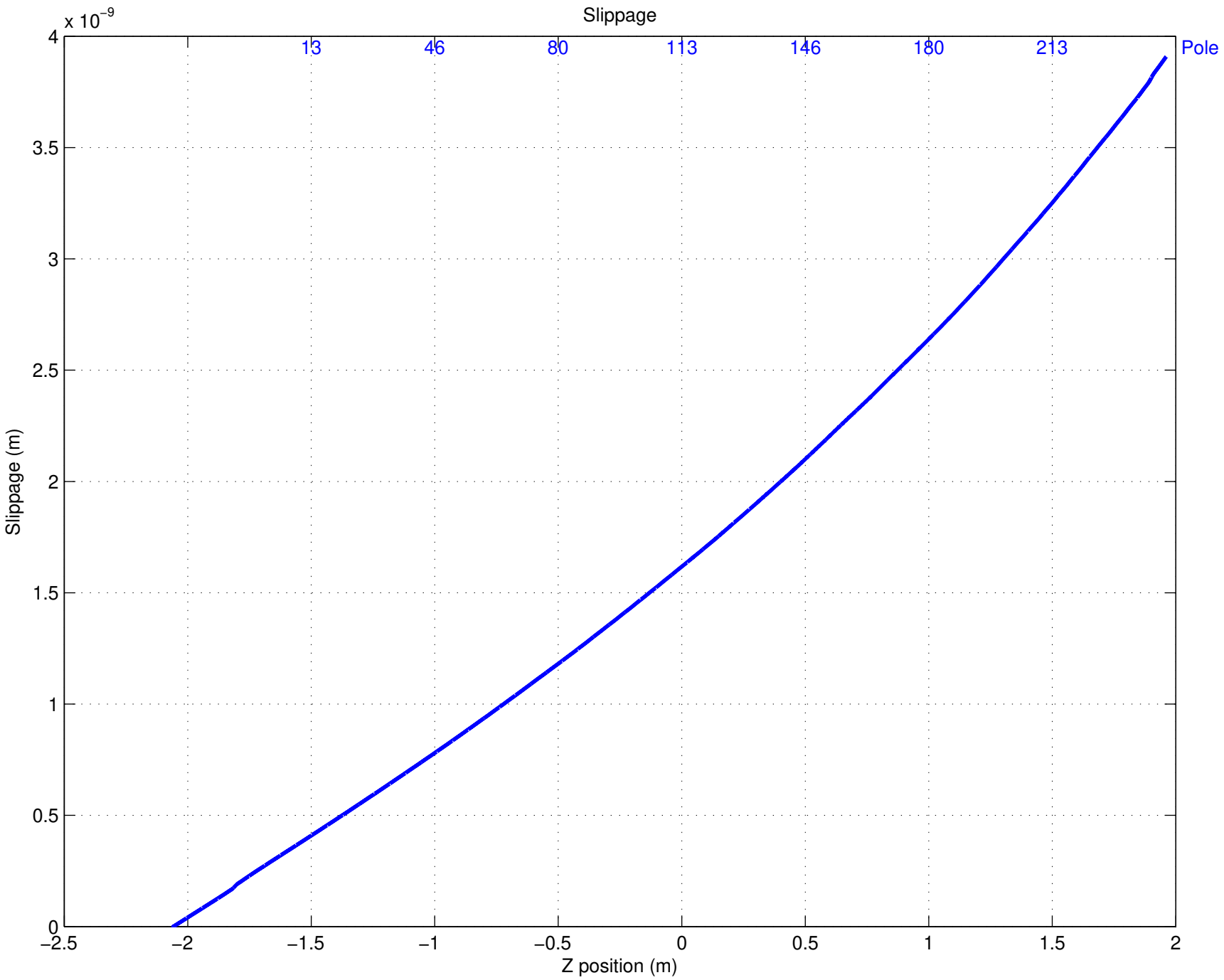

By Field Integrals
By (T)
0.2
0.1
0
−0.1
−0.2
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
x 10^−3
∫ By dz (Tm)
2
1
0
−1
−2
x 10^−4
∫ ∫ By dz dz (Tm^2)
−3
−4
Z position (m)

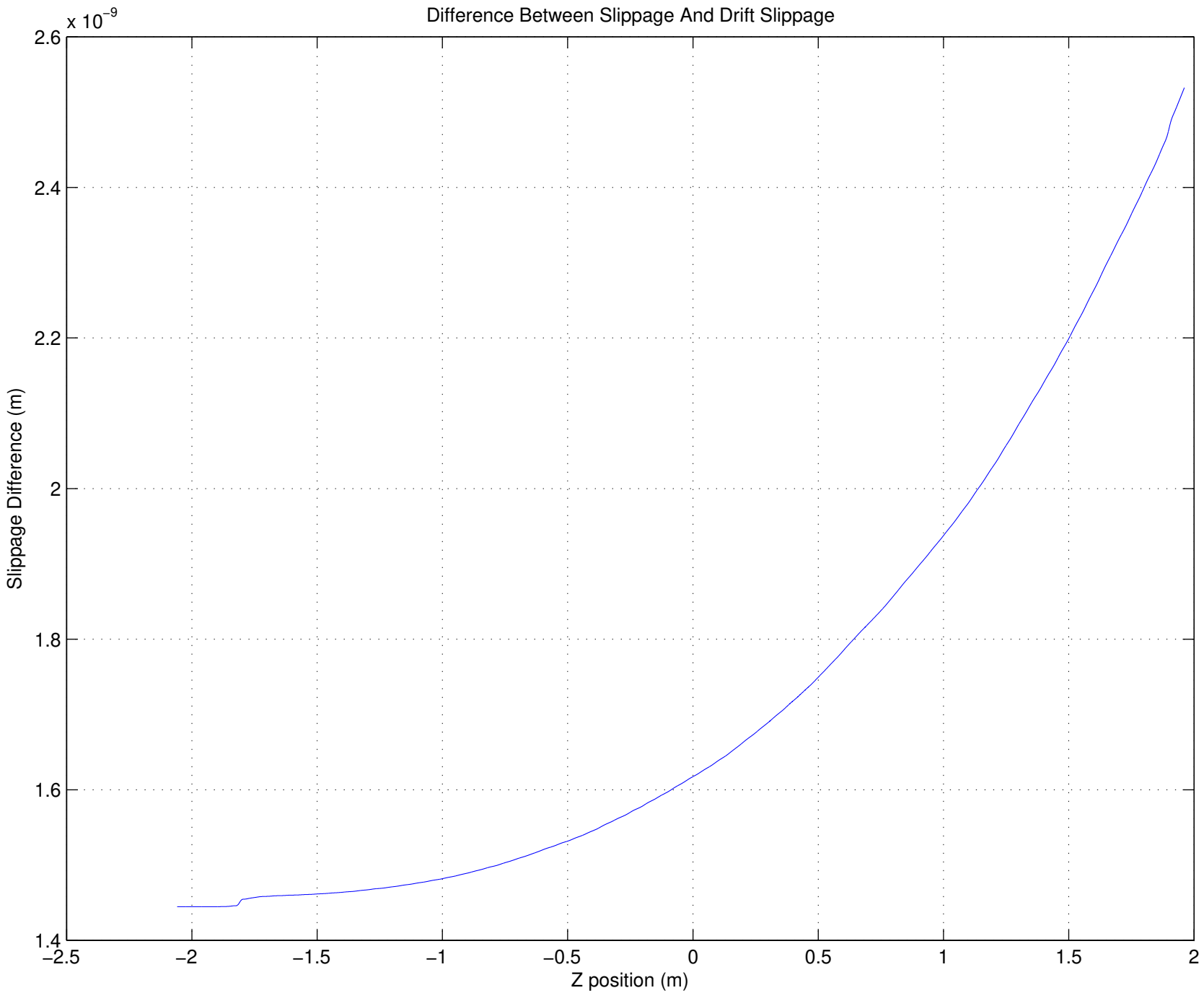

X Trajectory
x 10^-6
13
46
80
113
146
180
213
Pole
X (m)
x 10^-5
X'
x 10^-3
X'' (1/m)
Z position (m)

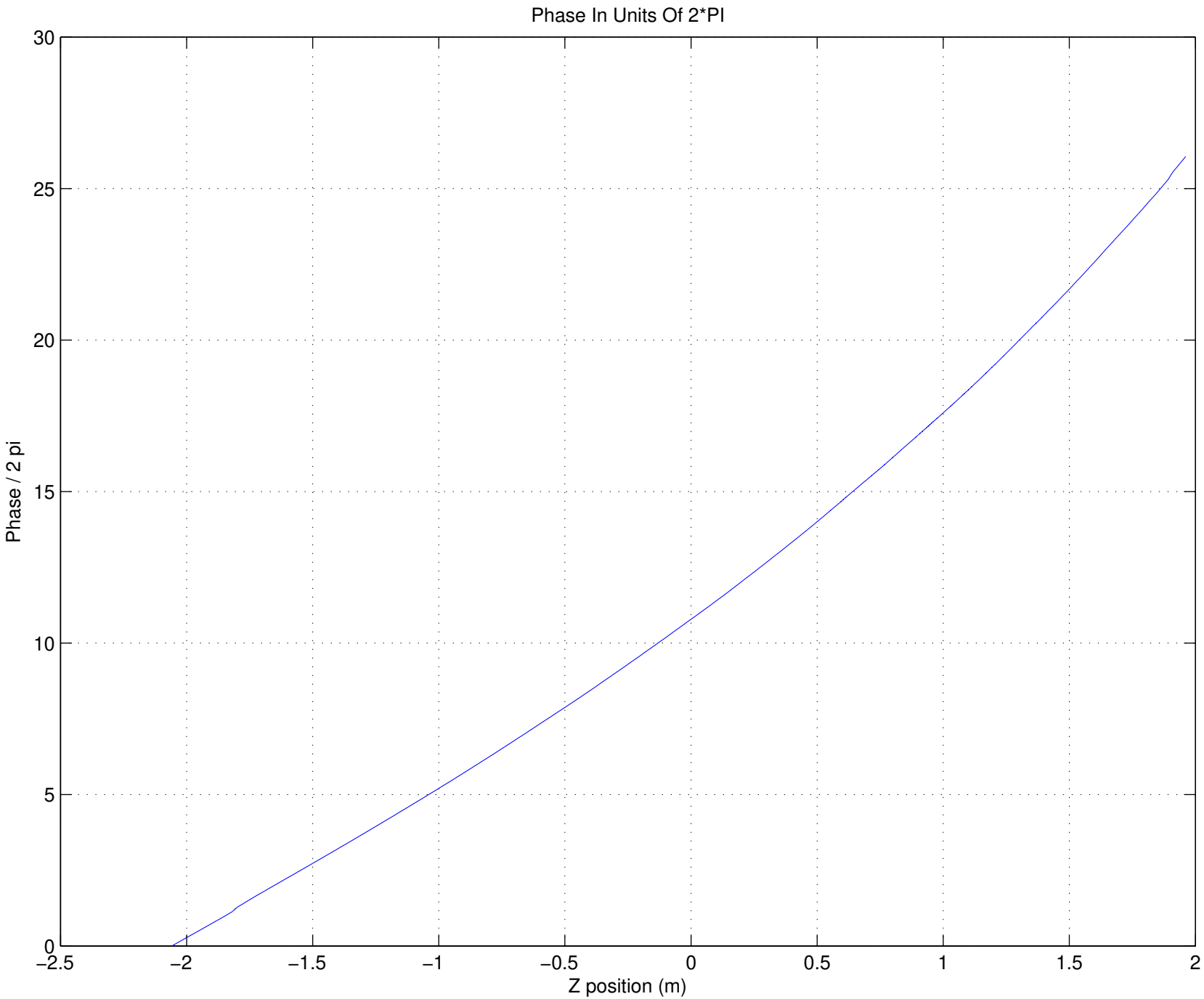

Y Trajectory
x 10^-5
13
46
80
113
146
180
213
Pole
Y (m)
x 10^-5
Y'
x 10^-4
Y'' (1/m)
Z position (m)

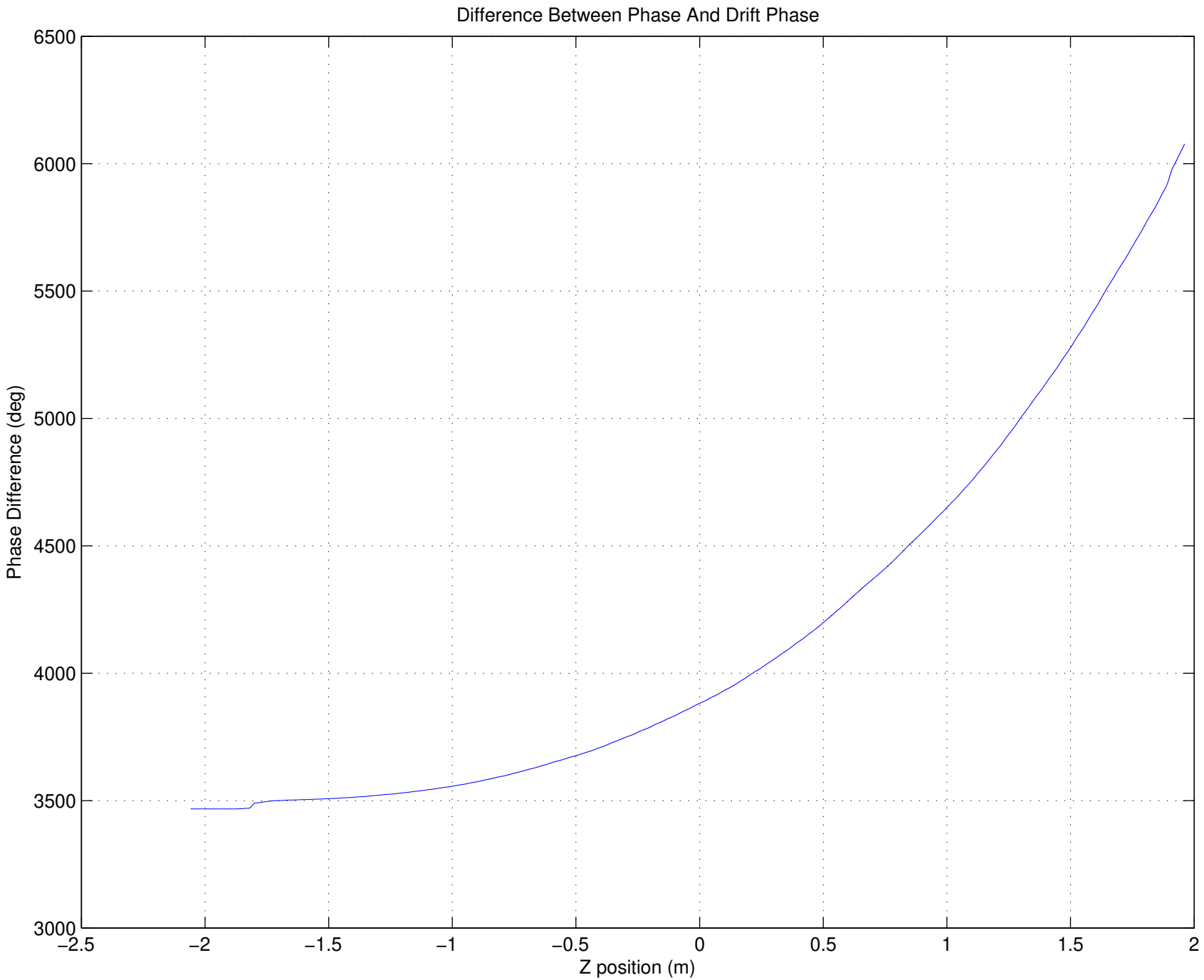

X Trajectory
x 10^-6
13
46
80
113
146
180
213
Pole
1
0
−1
−2
−3
−4
−5
−6
−7
−8
X (m)
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z position (m)


Y Trajectory
x 10^-5
13
46
80
113
146
180
213
Pole
1
0
−1
−2
−3
−4
−5
−6
−7
−8
−9
Y (m)
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z position (m)


Slippage
x 10^-9
13
46
80
113
146
180
213
Pole
4
3.5
3
2.5
2
1.5
1
0.5
0
Slippage (m)
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z position (m)


Difference Between Slippage And Drift Slippage
x 10^-9
2.6
2.4
2.2
2
1.8
1.6
1.4
Slippage Difference (m)
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Z position (m)


Phase In Units Of 2*PI
Phase / 2 pi
Z position (m)
30
25
20
15
10
5
0
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2


Difference Between Phase And Drift Phase
Phase Difference (deg)
Z position (m)
6500
6000
5500
5000
4500
4000
3500
3000
−2.5
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2