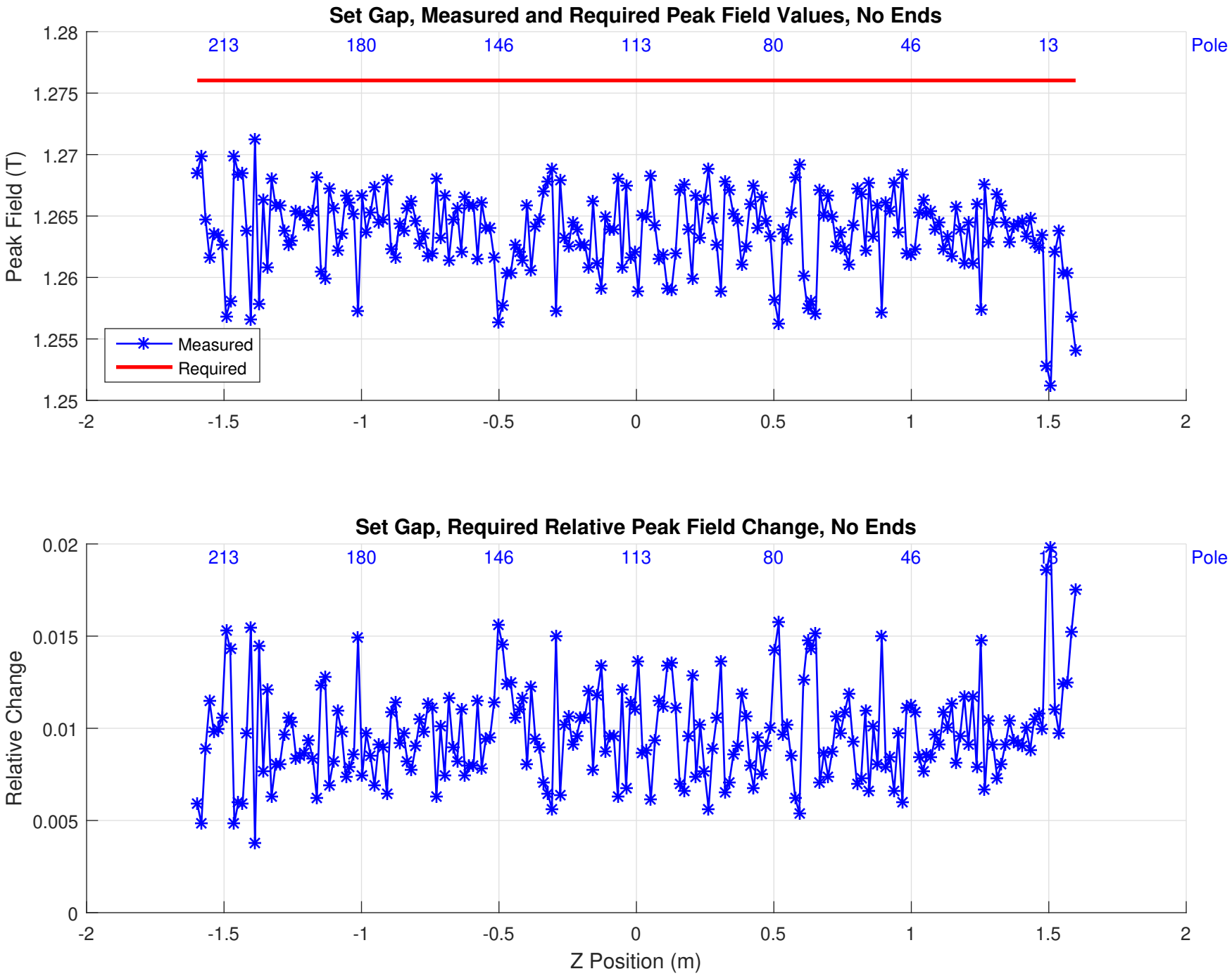
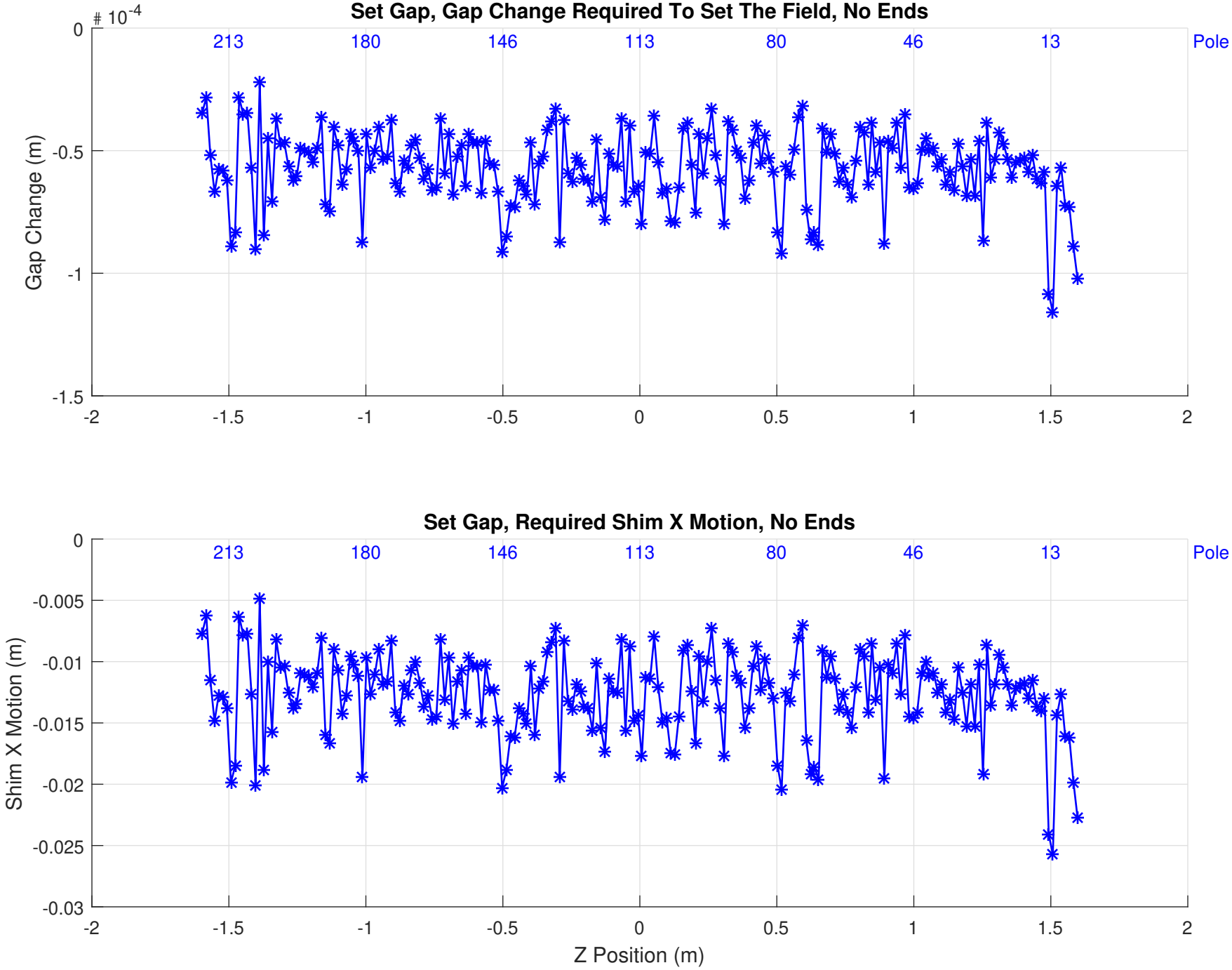
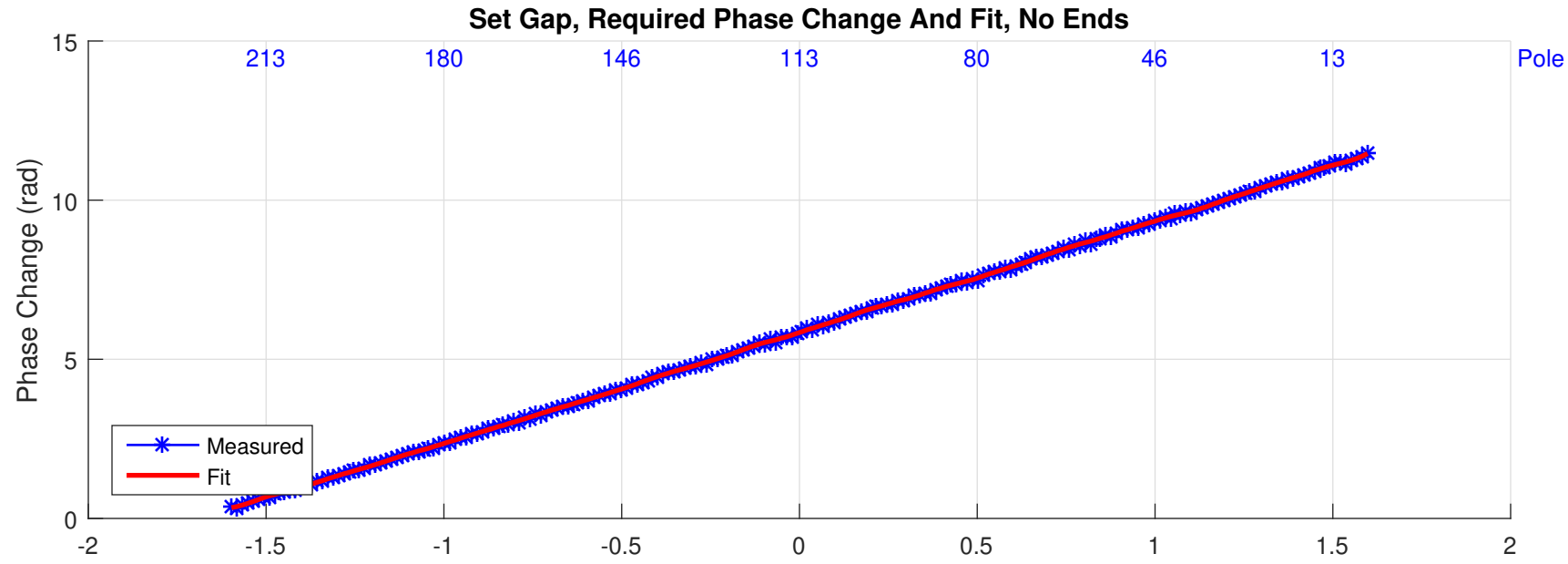
SLAC Magnetic Measurements

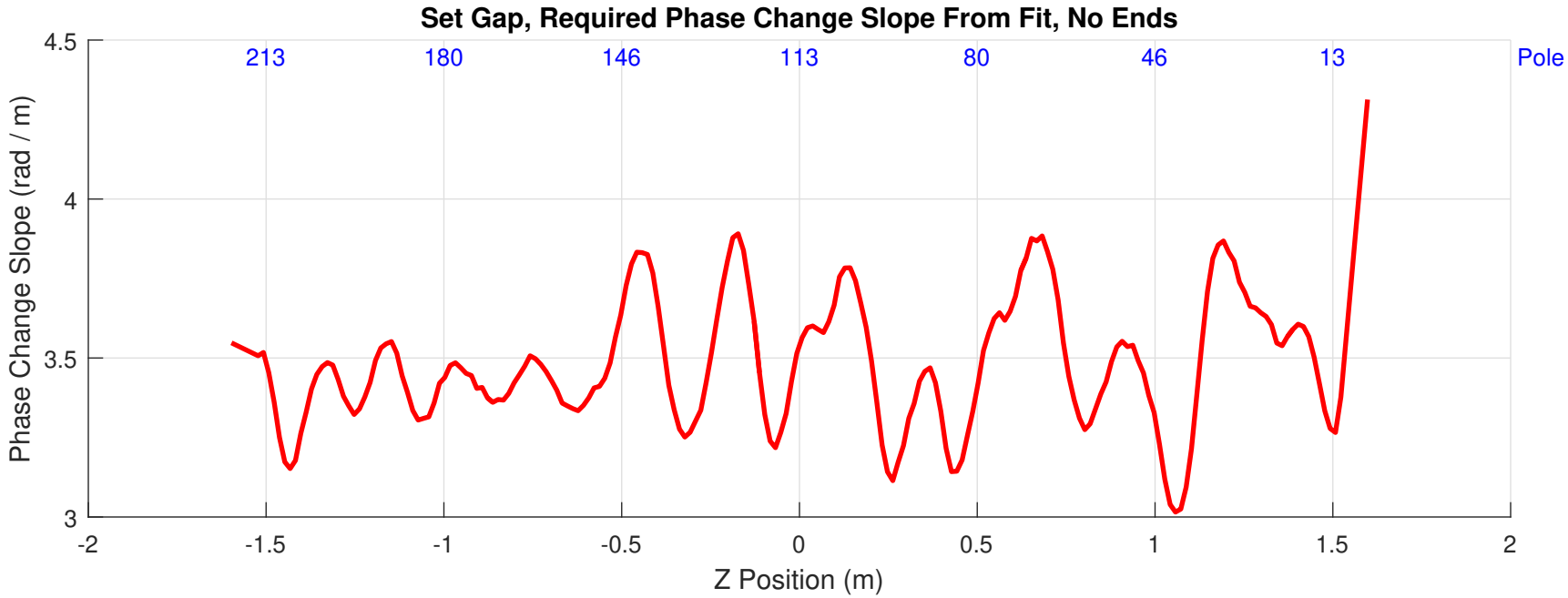
Planar Insertion Device Shim Analysis

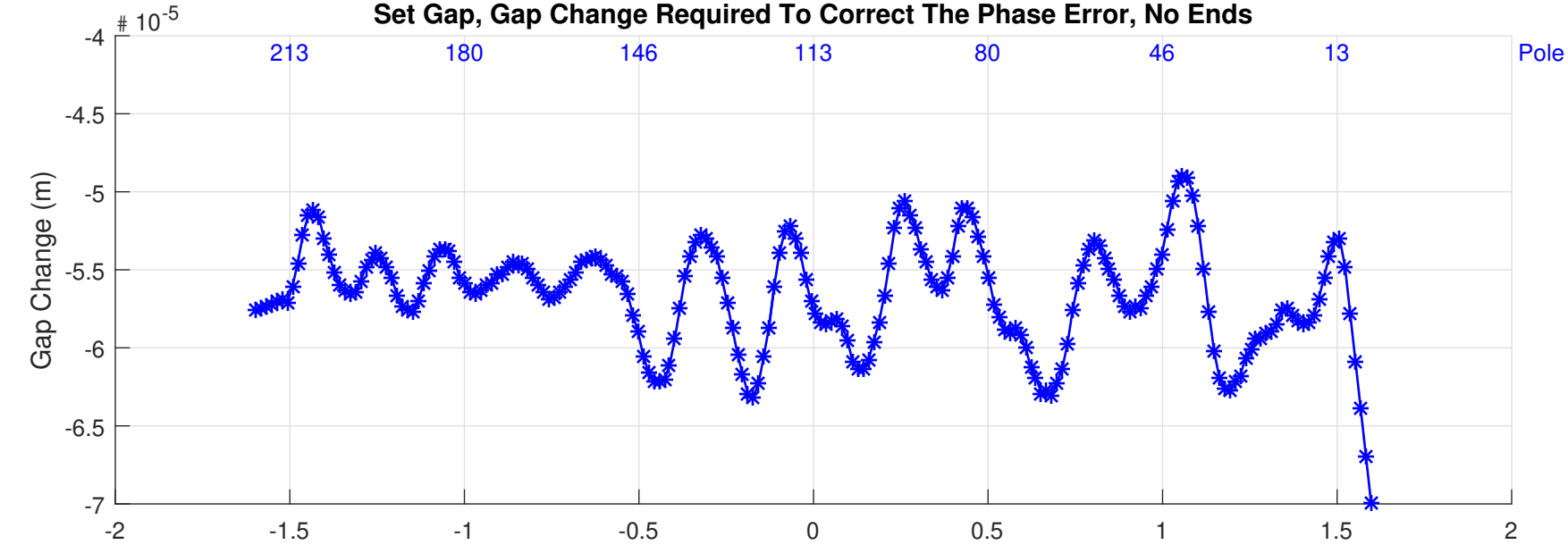
Parameters:
INPUT-FILE-DIR =S:\MagData\LCLS\Undulator\L143-112000-04\DATASET0004\INITIAL-MEASUREMENT\
INPUT-FILE-NAME =x+00000-y+000-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =1
GAMMA =26689
NOM-LAMBDA-U =0.03
NOM-K-VALUE =3.5
NOM-LAMBDA-R =1.5004e-10
NUM-POLES =226
NUM-END-POLES =6
CELL-LENGTH =3.656

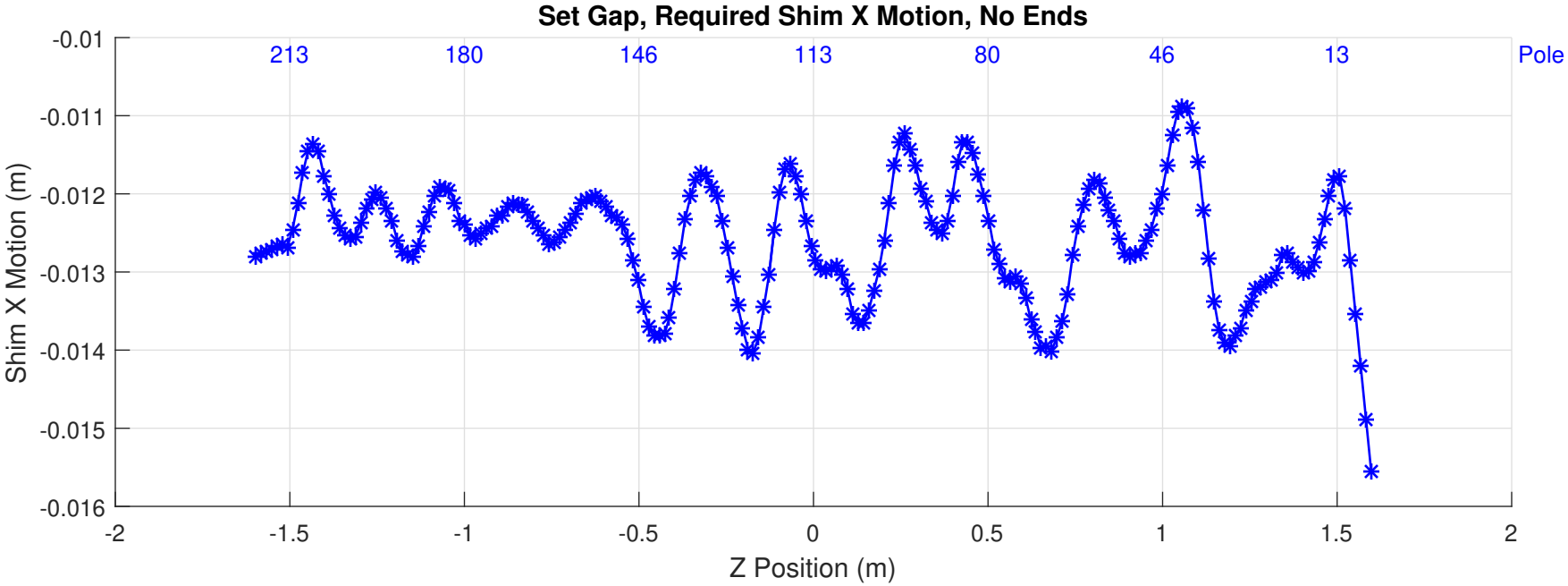

Set Gap, Measured and Required Peak Field Values, No Ends
213
180
146
113
80
46
13
Pole
Peak Field (T)
1.28
1.275
1.27
1.265
1.26
1.255
1.25
Measured
Required
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Set Gap, Required Relative Peak Field Change, No Ends
Relative Change
0.02
0.015
0.01
0.005
0
Z Position (m)

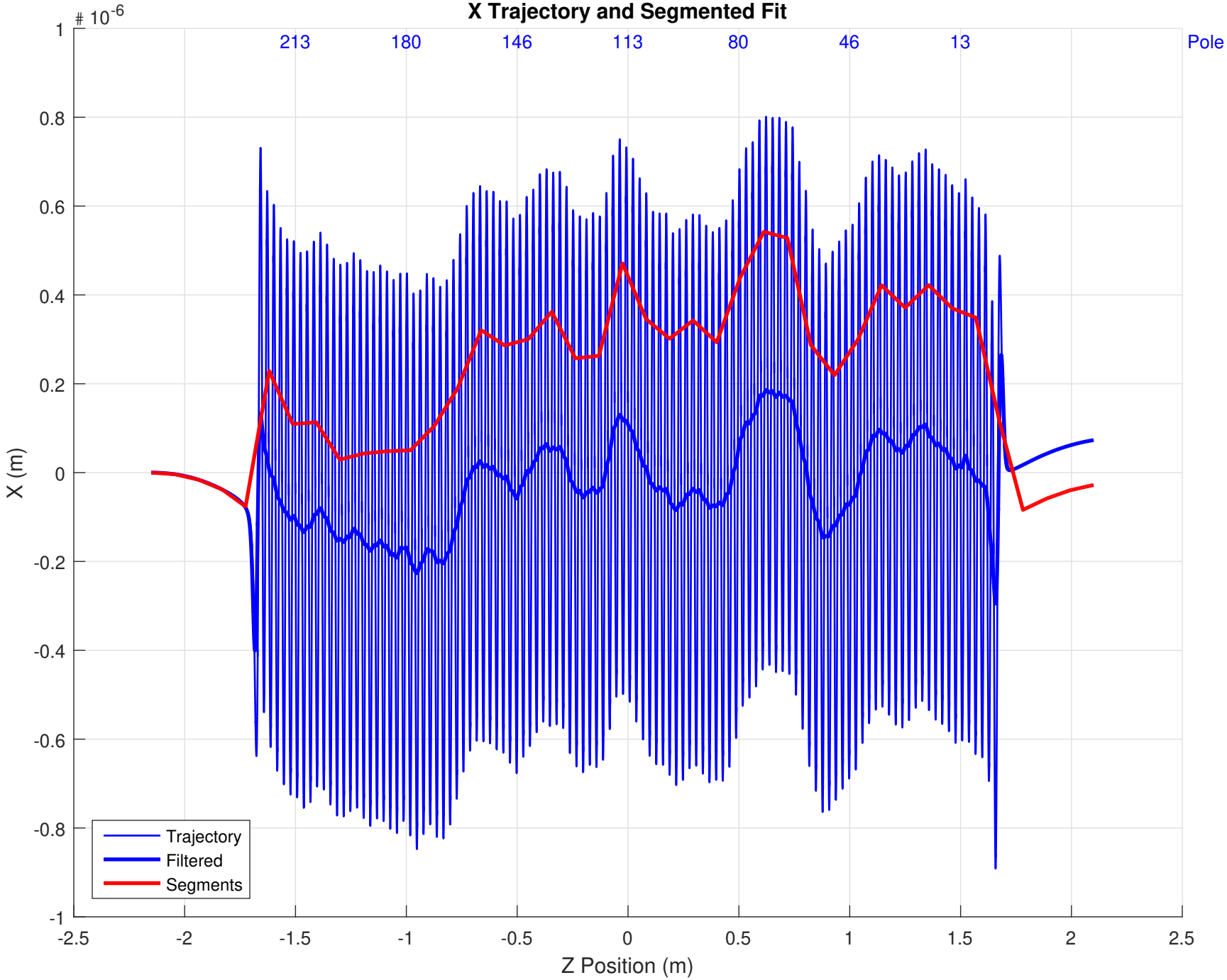

Set Gap, Gap Change Required To Set The Field, No Ends
10^-4
0
-0.5
-1
-1.5
Gap Change (m)
213
180
146
113
80
46
13
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Set Gap, Required Shim X Motion, No Ends
0
-0.005
-0.01
-0.015
-0.02
-0.025
-0.03
Shim X Motion (m)
213
180
146
113
80
46
13
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

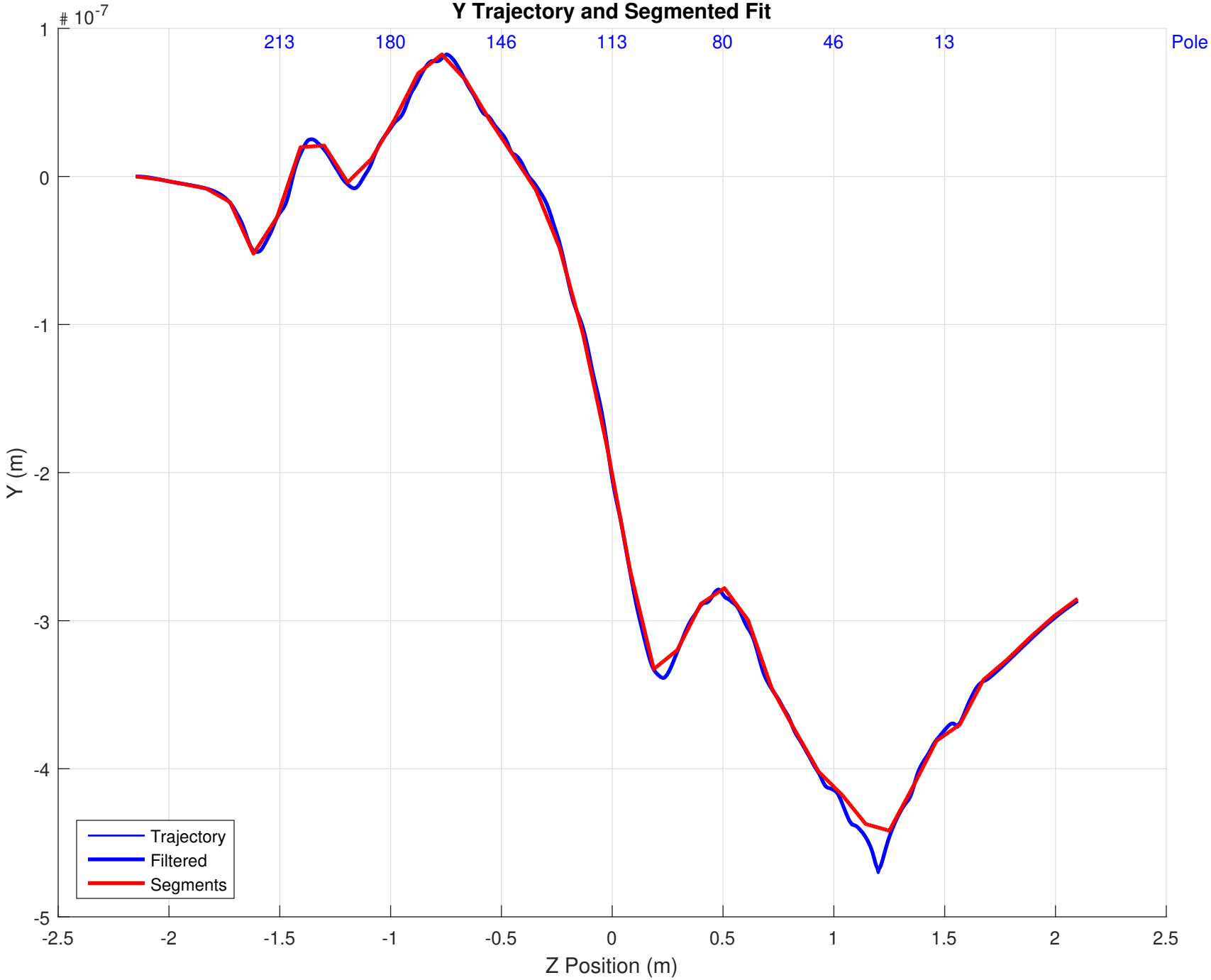

Set Gap, Required Phase Change And Fit, No Ends
213
180
146
113
80
46
13
Pole
Phase Change (rad)
15
10
5
0
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Measured
Fit

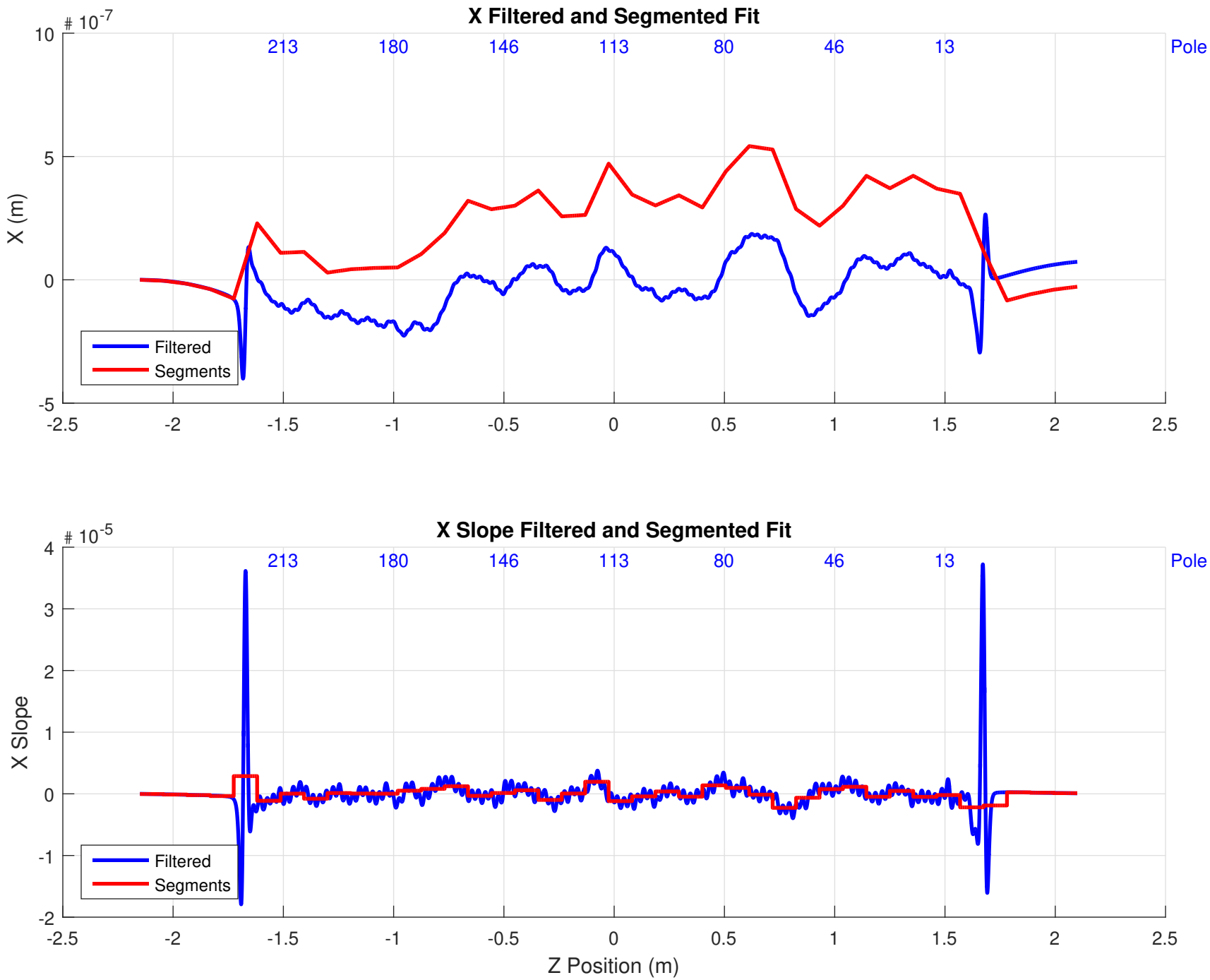

Set Gap, Required Phase Change Slope From Fit, No Ends
213
180
146
113
80
46
13
Pole
Phase Change Slope (rad / m)
4.5
4
3.5
3
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

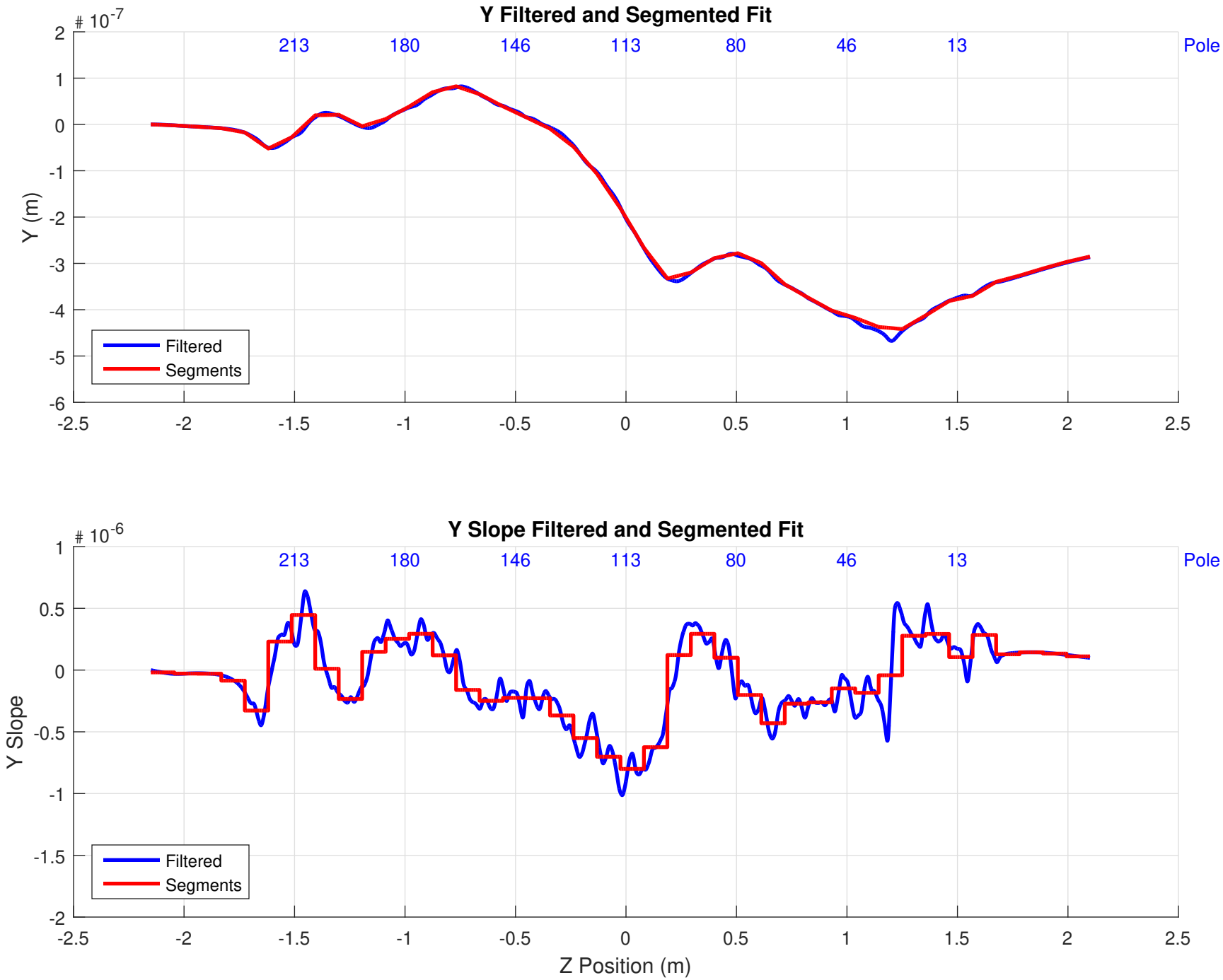

Set Gap, Gap Change Required To Correct The Phase Error, No Ends
10^-5
-4
-4.5
-5
-5.5
-6
-6.5
-7
Gap Change (m)
213
180
146
113
80
46
13
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

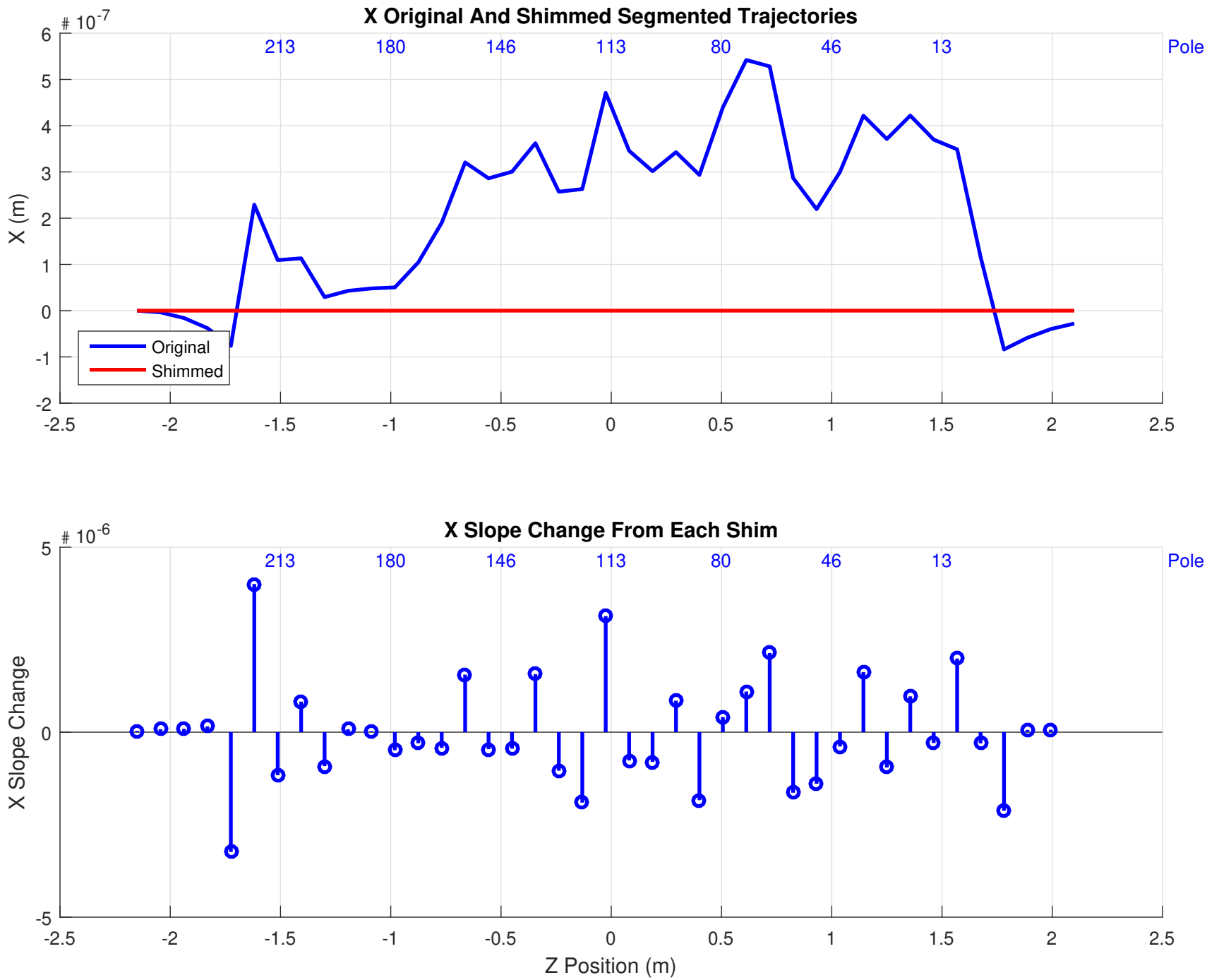

Set Gap, Required Shim X Motion, No Ends
-0.01
-0.011
-0.012
-0.013
-0.014
-0.015
-0.016
Shim X Motion (m)
213
180
146
113
80
46
13
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

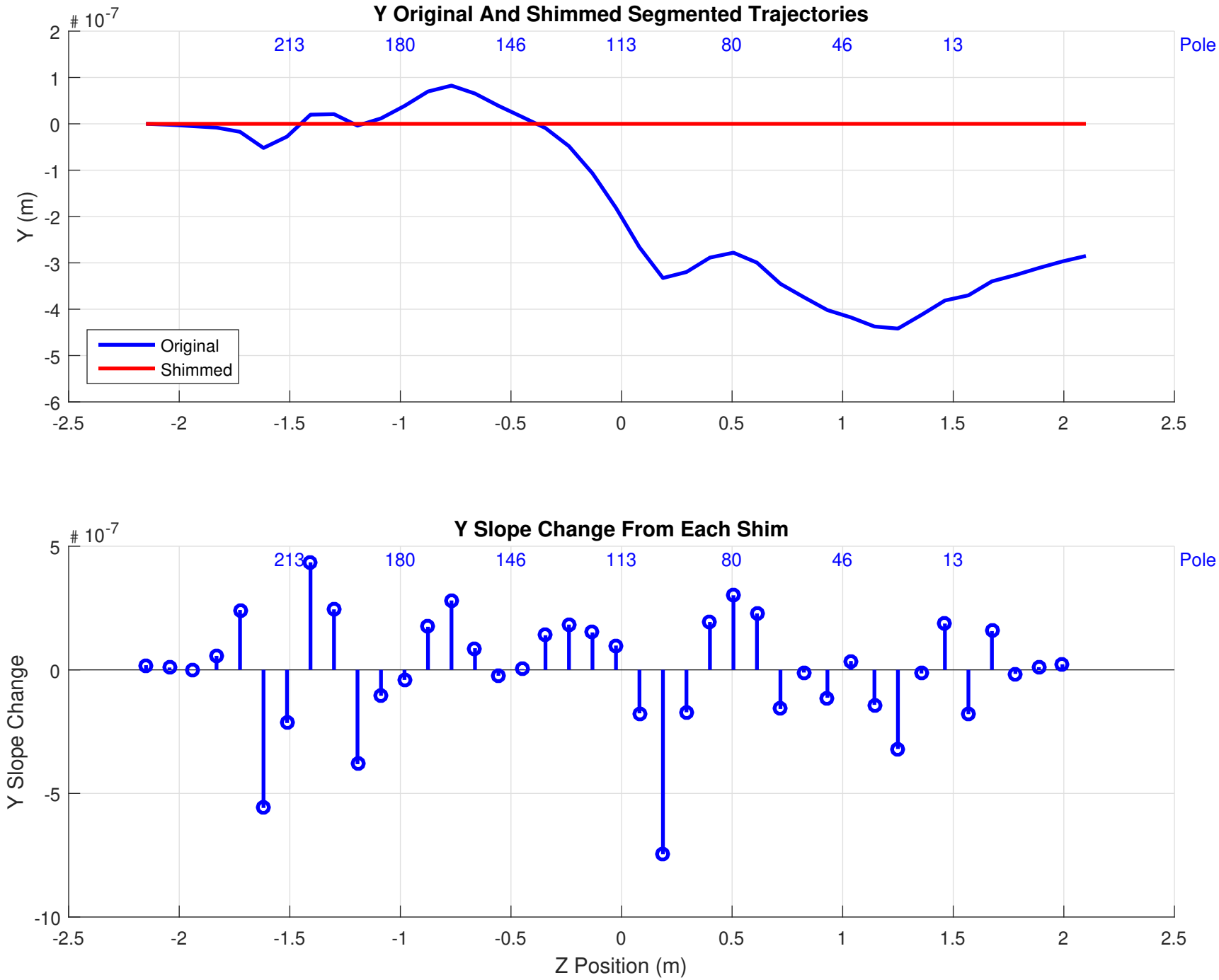

X Trajectory and Segmented Fit
10^-6
213
180
146
113
80
46
13
Pole
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
X (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)
Trajectory
Filtered
Segments

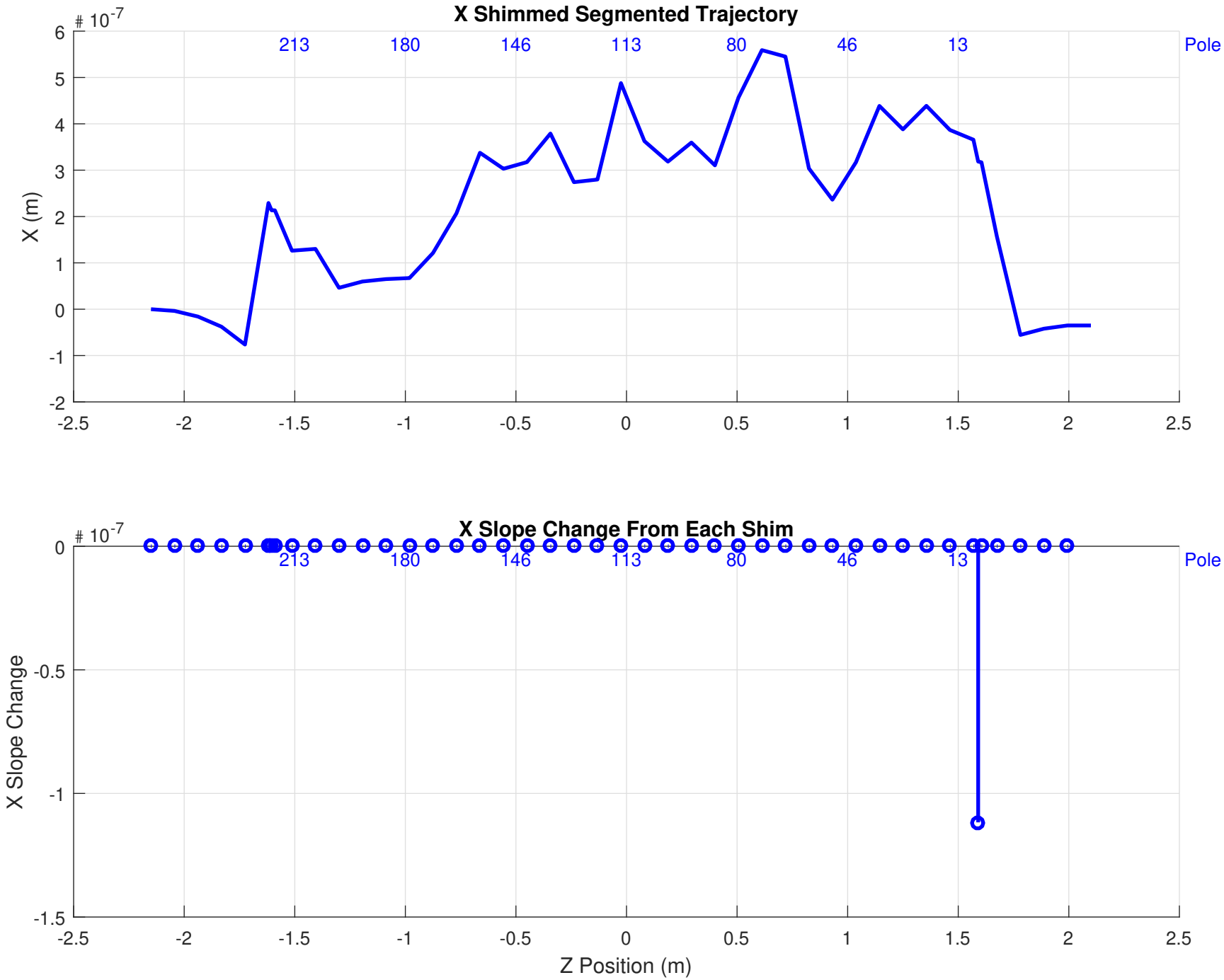

Y Trajectory and Segmented Fit
10^-7
213
180
146
113
80
46
13
Pole
1
0
-1
-2
-3
-4
-5
Y (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)
Trajectory
Filtered
Segments

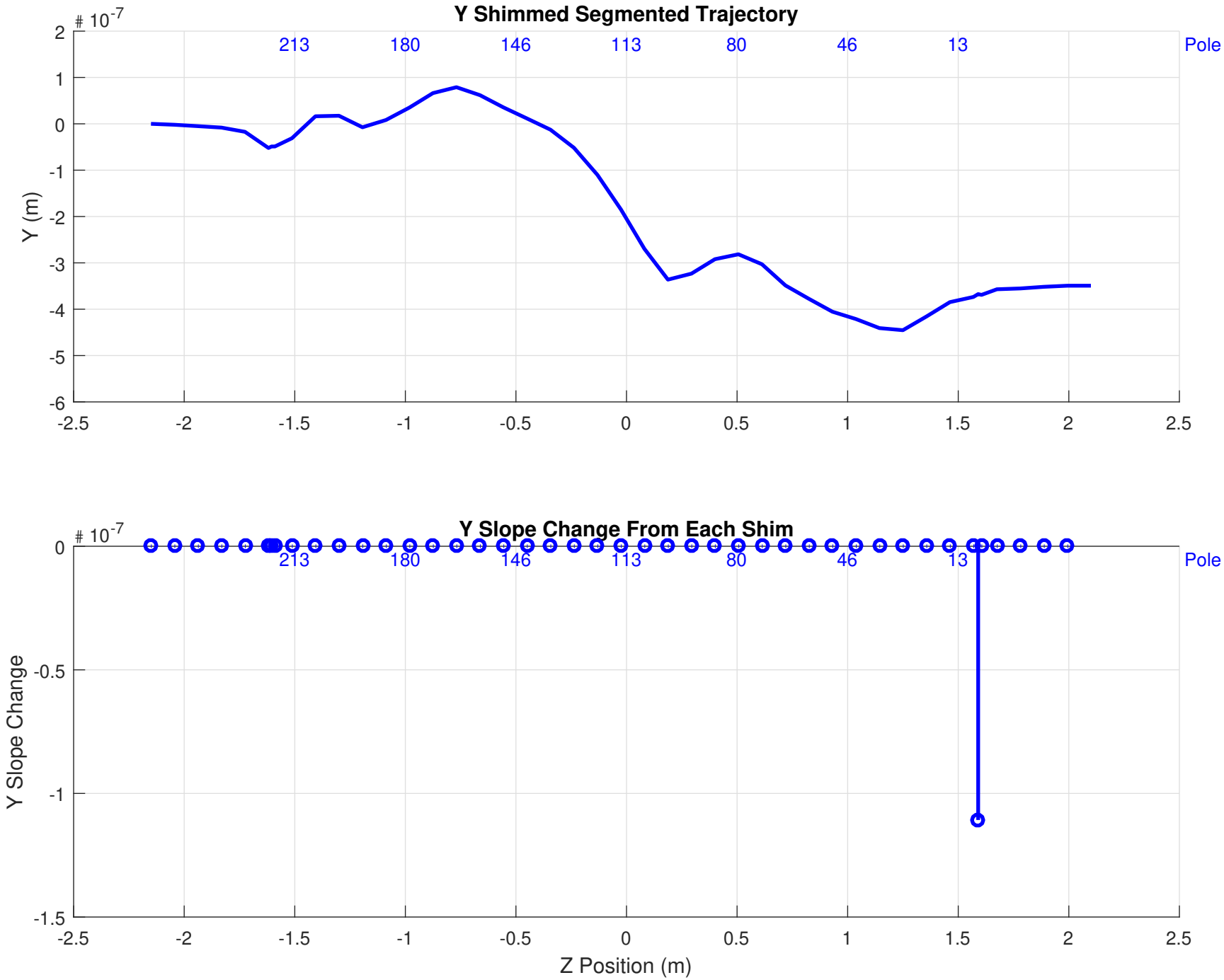

X Filtered and Segmented Fit
10^-7
213
180
146
113
80
46
13
Pole
X (m)
Filtered
Segments
X Slope Filtered and Segmented Fit
10^-5
X Slope
Z Position (m)


Y Filtered and Segmented Fit
10^-7
213
180
146
113
80
46
13
Pole
Y (m)
Filtered
Segments
Y Slope Filtered and Segmented Fit
10^-6
Y Slope
Z Position (m)


X Original And Shimmed Segmented Trajectories
10^-7
213
180
146
113
80
46
13
Pole
X (m)
Original
Shimmed
X Slope Change From Each Shim
10^-6
X Slope Change
Z Position (m)


Y Original And Shimmed Segmented Trajectories
10^-7
213
180
146
113
80
46
13
Pole
Y (m)
Original
Shimmed
Y Slope Change From Each Shim
10^-7
Y Slope Change
Z Position (m)


X Shimmed Segmented Trajectory
10^-7
X (m)
213
180
146
113
80
46
13
Pole
X Slope Change From Each Shim
X Slope Change
Z Position (m)


Y Shimmed Segmented Trajectory
10^-7
213
180
146
113
80
46
13
Pole
Y (m)
Y Slope Change From Each Shim
Y Slope Change
Z Position (m)