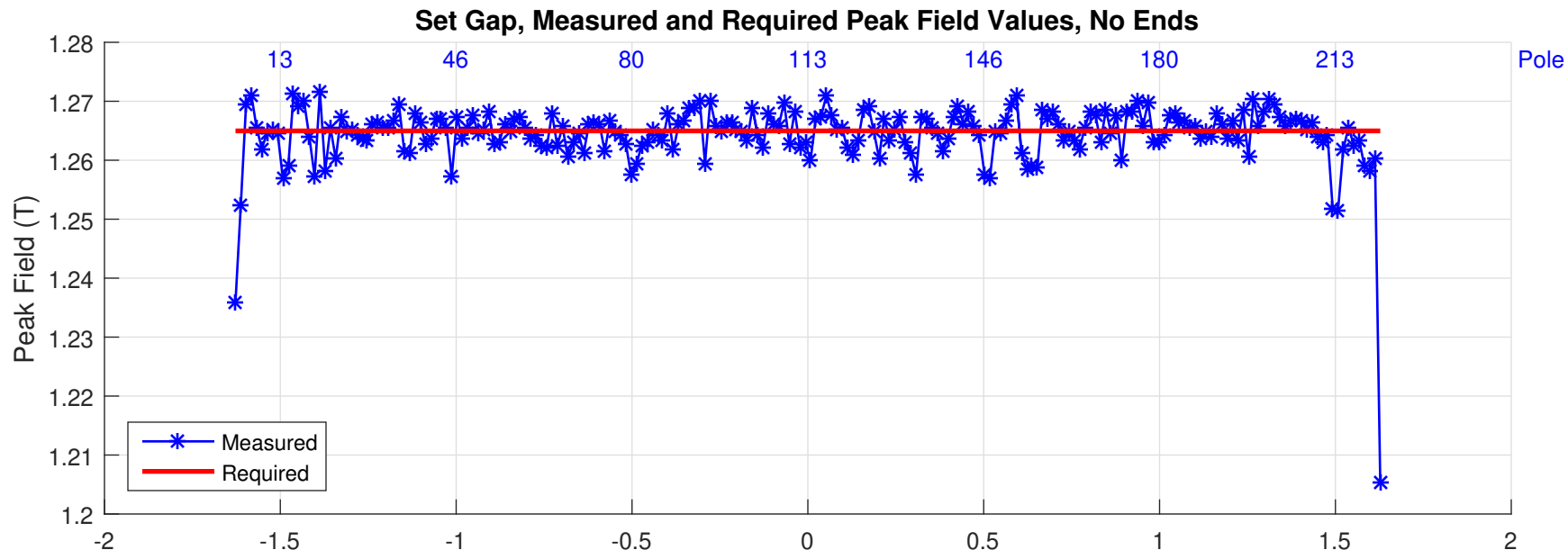
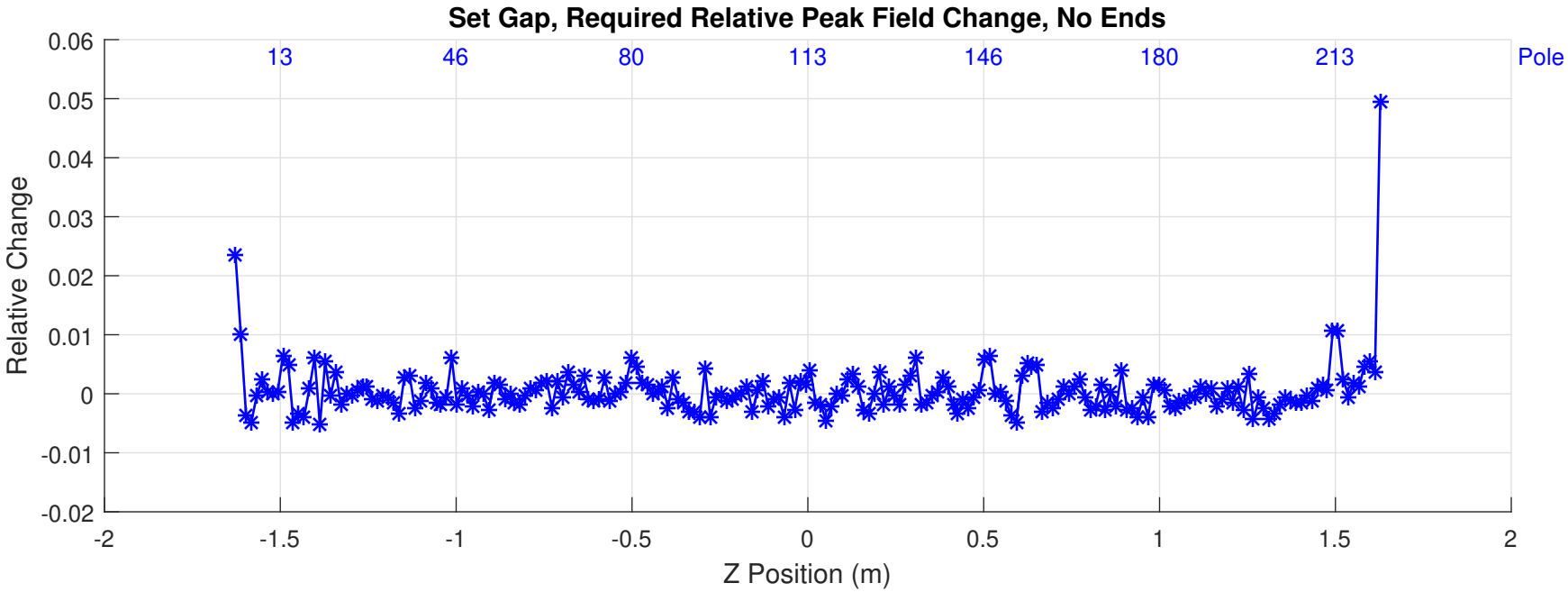
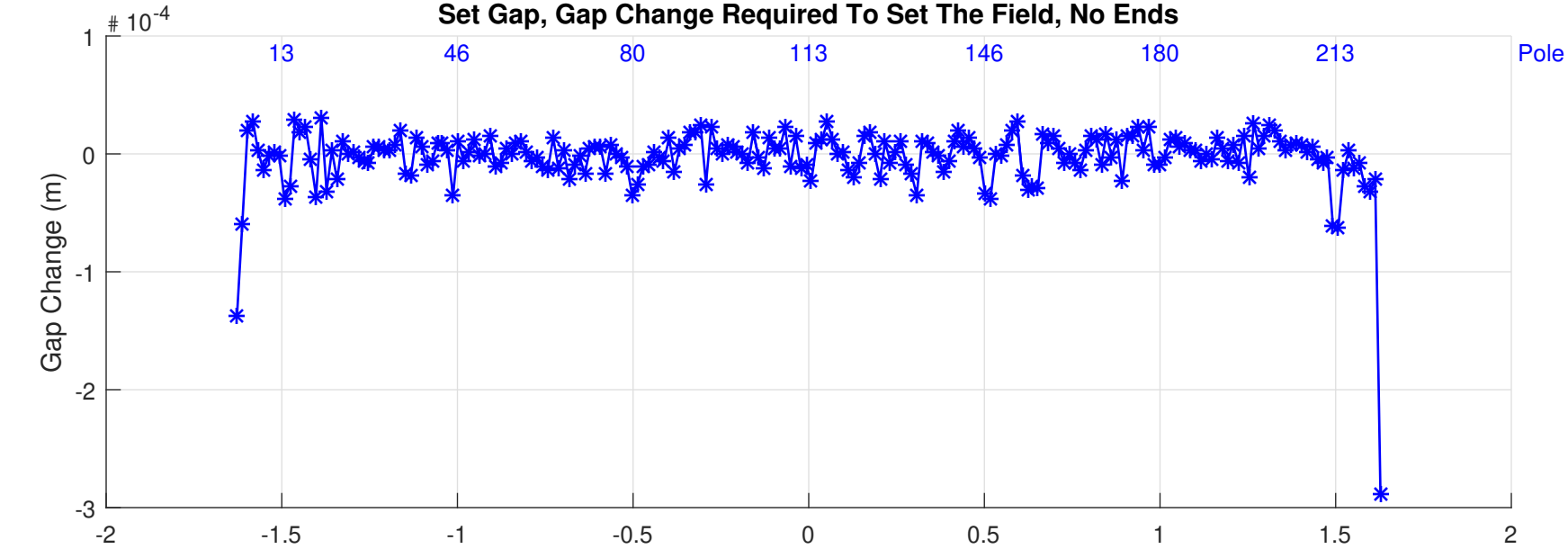
SLAC Magnetic Measurements

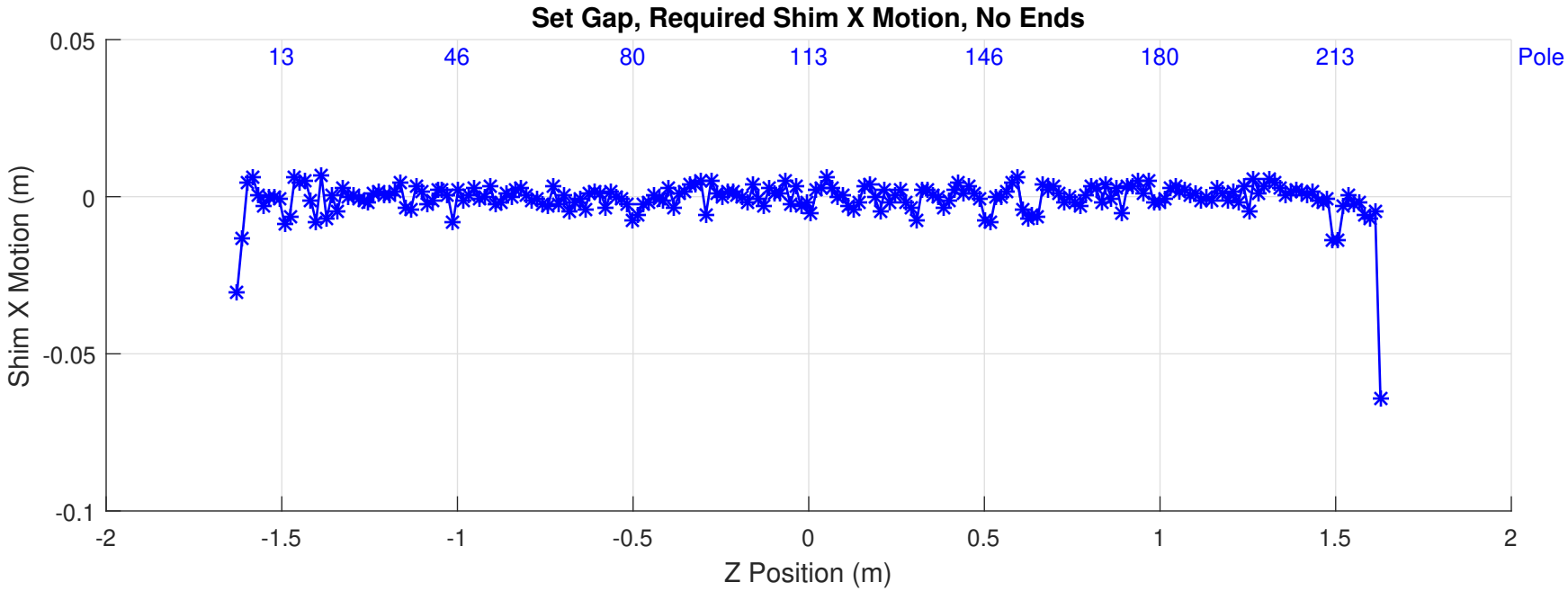
Planar Insertion Device Shim Analysis

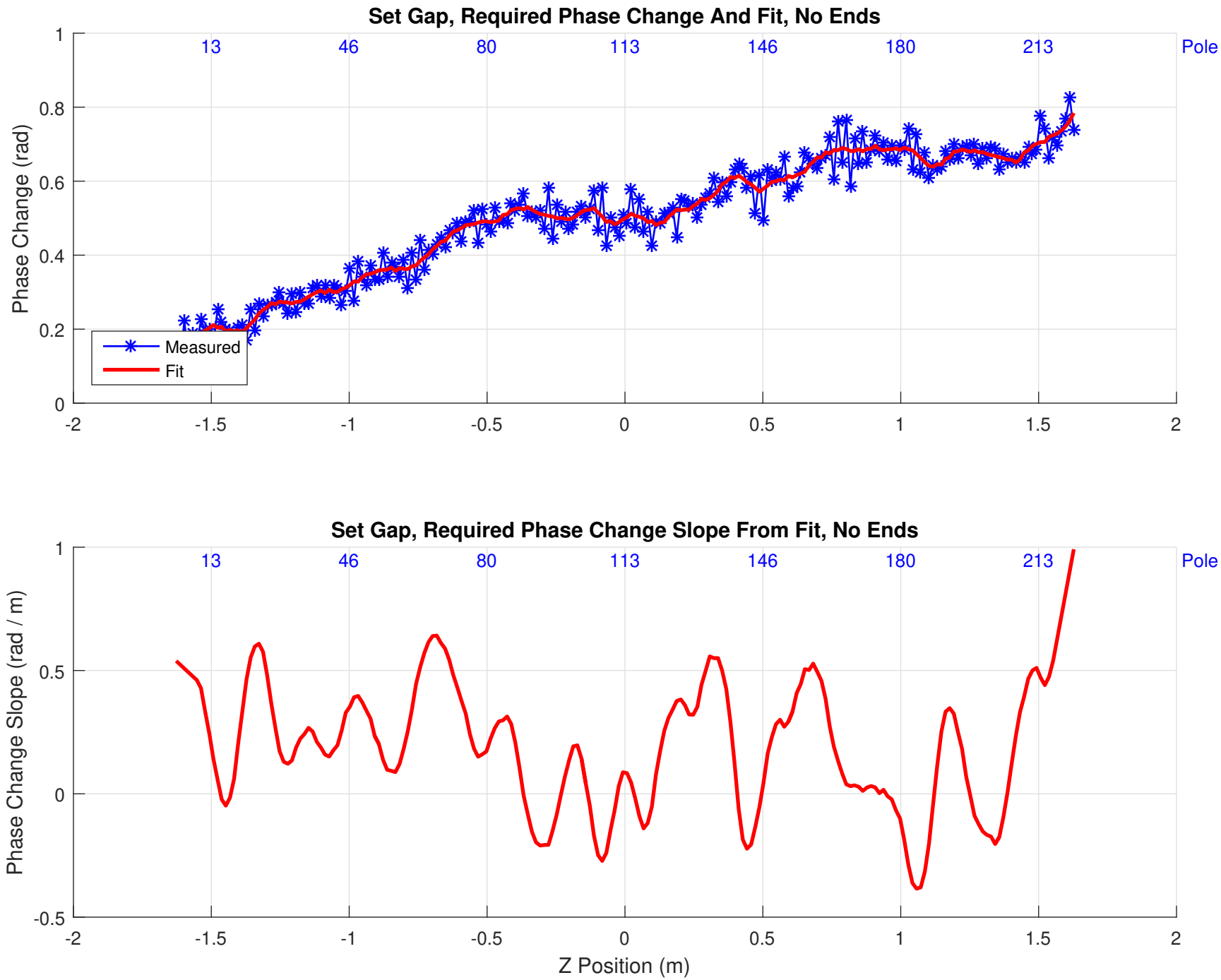
Parameters:
INPUT-FILE-DIR =s:\magdata\LCLS\Undulator\L143-112000-04\DATASET0005\Tuning\Z Scans\Run 006\
INPUT-FILE-NAME =x+00000-y+000-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =0
GAMMA =26689
NOM-LAMBDA-U =0.03
NOM-K-VALUE =3.5
NOM-LAMBDA-R =1.5004e-10
NUM-POLES =226
NUM-END-POLES =4
CELL-LENGTH =3.656

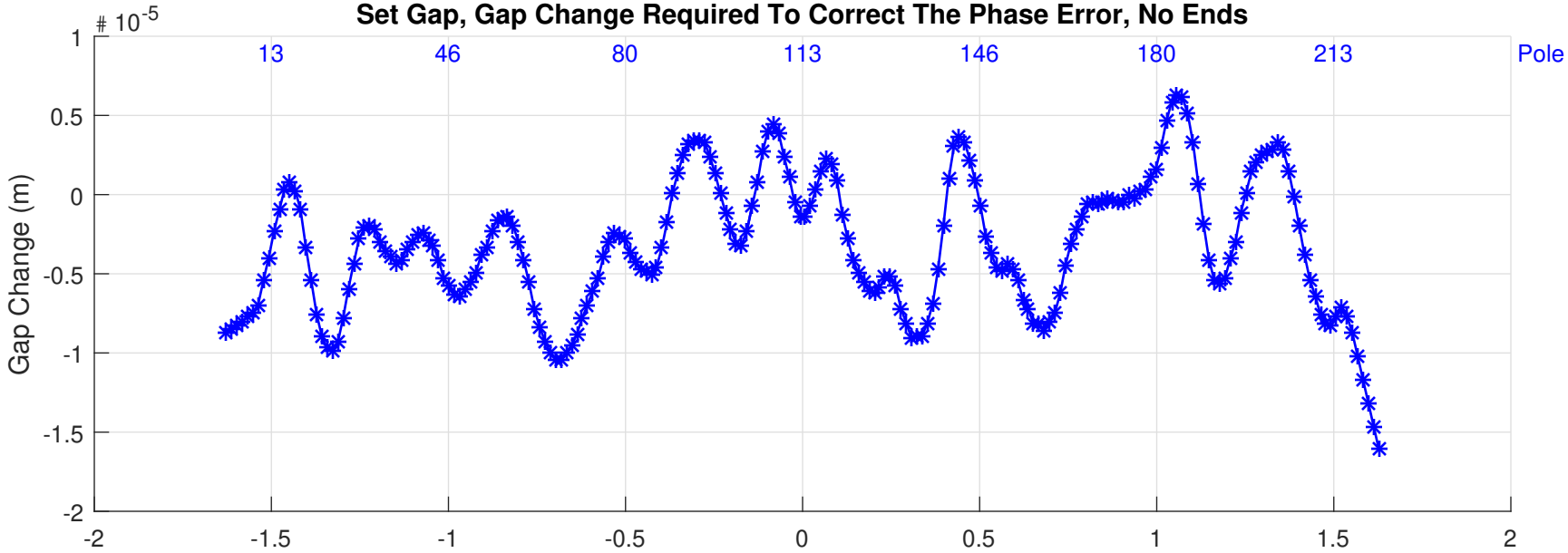

Set Gap, Measured and Required Peak Field Values, No Ends
Peak Field (T)
1.28
1.27
1.26
1.25
1.24
1.23
1.22
1.21
1.2
13
46
80
113
146
180
213
Pole
Measured
Required
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

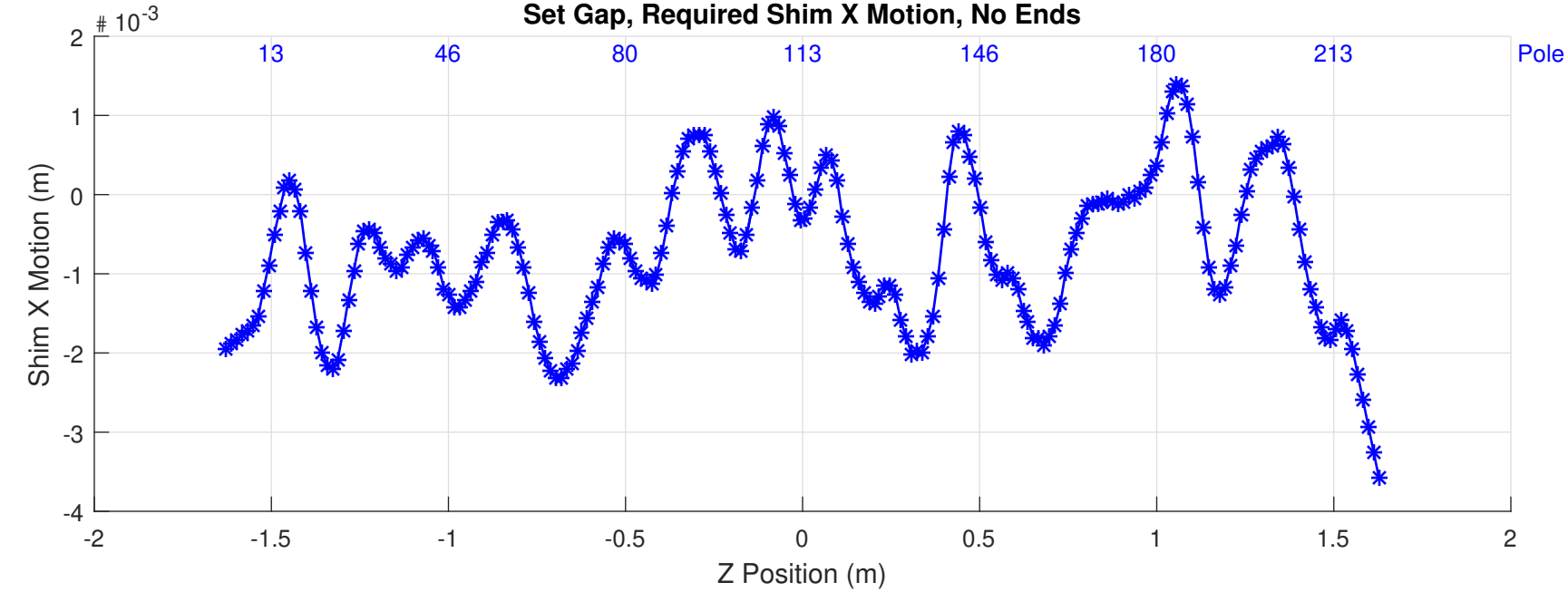

Set Gap, Required Relative Peak Field Change, No Ends
Relative Change
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02
13
46
80
113
146
180
213
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

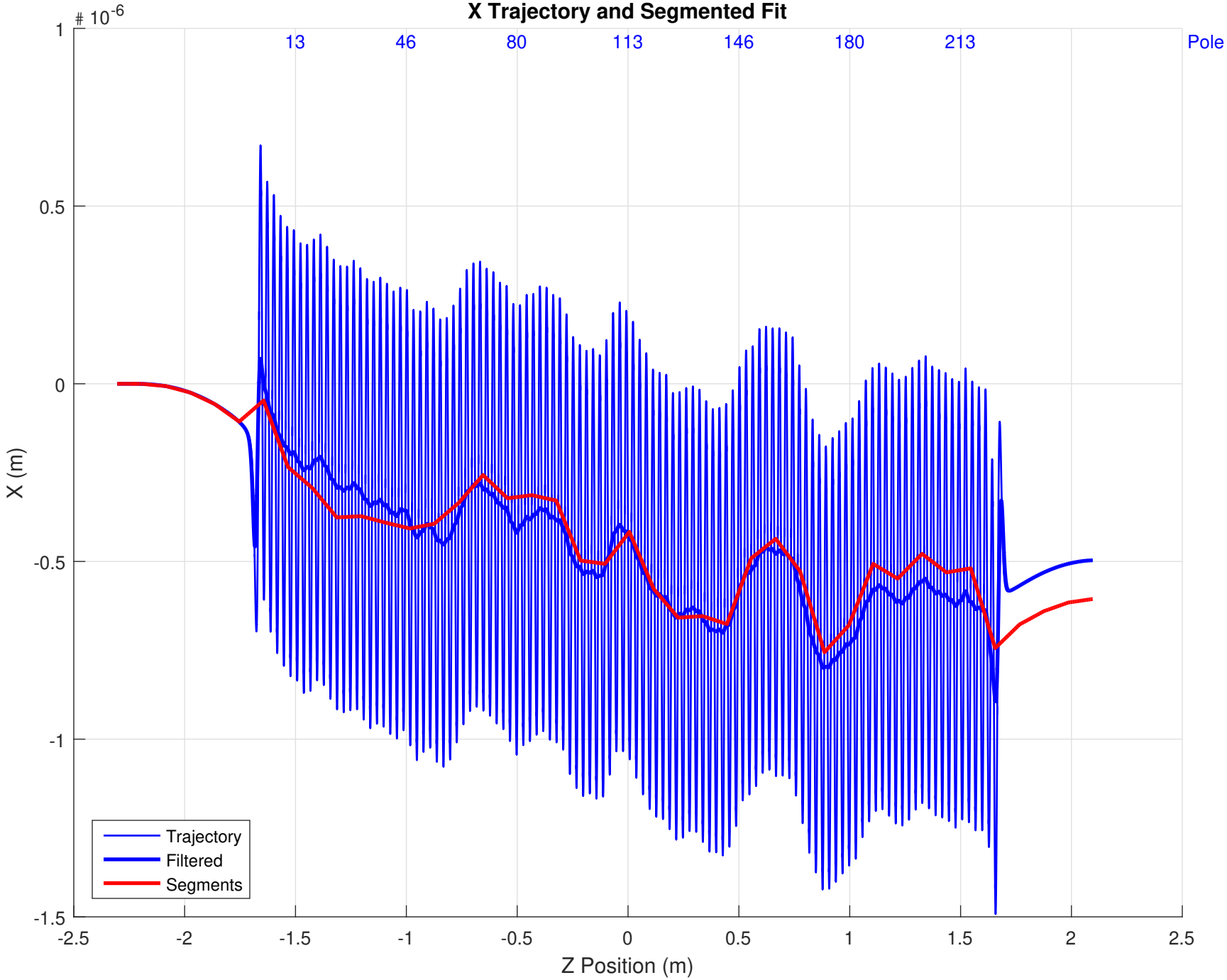

Set Gap, Gap Change Required To Set The Field, No Ends
# 10^-4
Gap Change (m)
Pole
13
46
80
113
146
180
213
1
0
-1
-2
-3
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

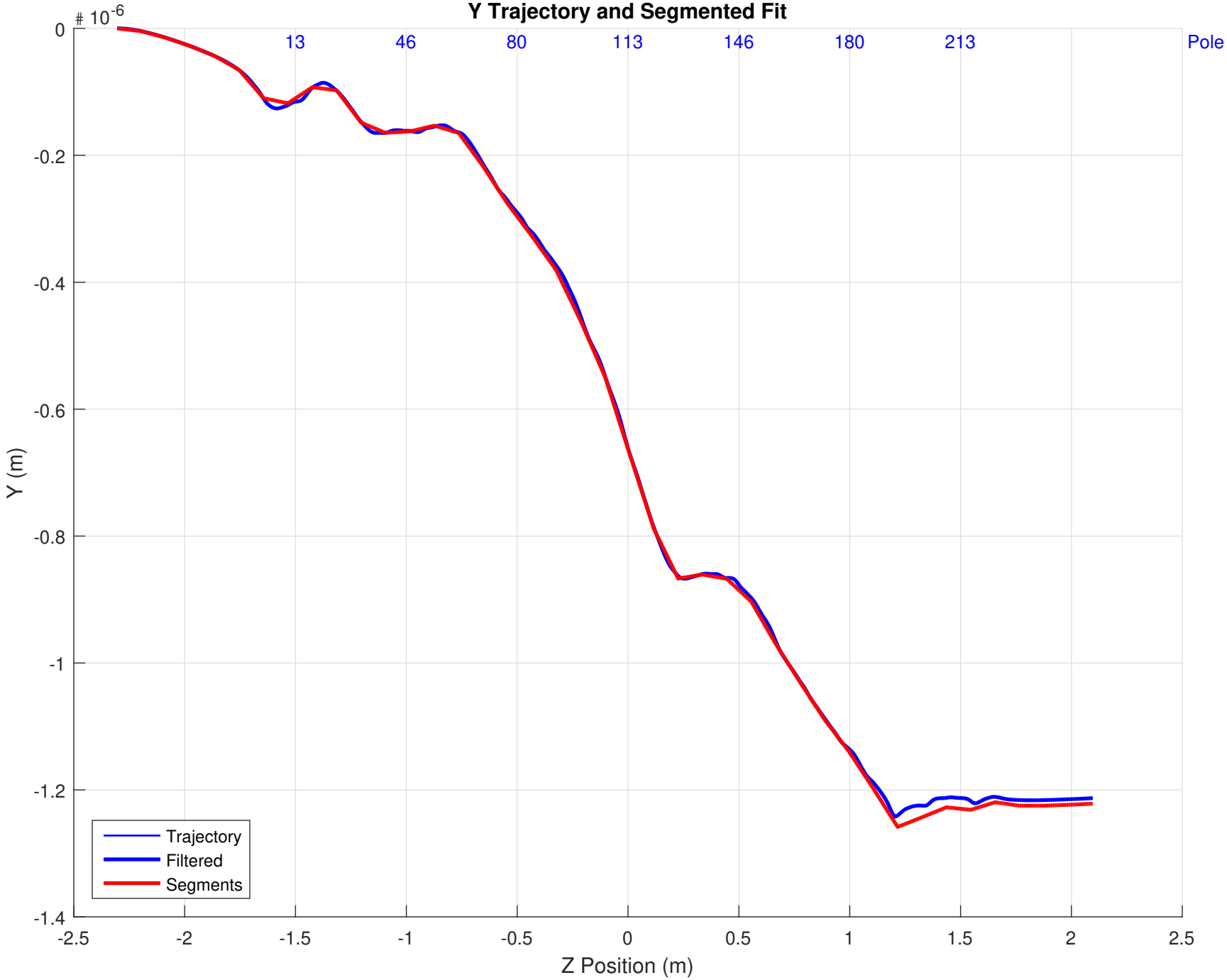

Set Gap, Required Shim X Motion, No Ends
Shim X Motion (m)
Z Position (m)
Pole
13
46
80
113
146
180
213
0.05
0
-0.05
-0.1
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

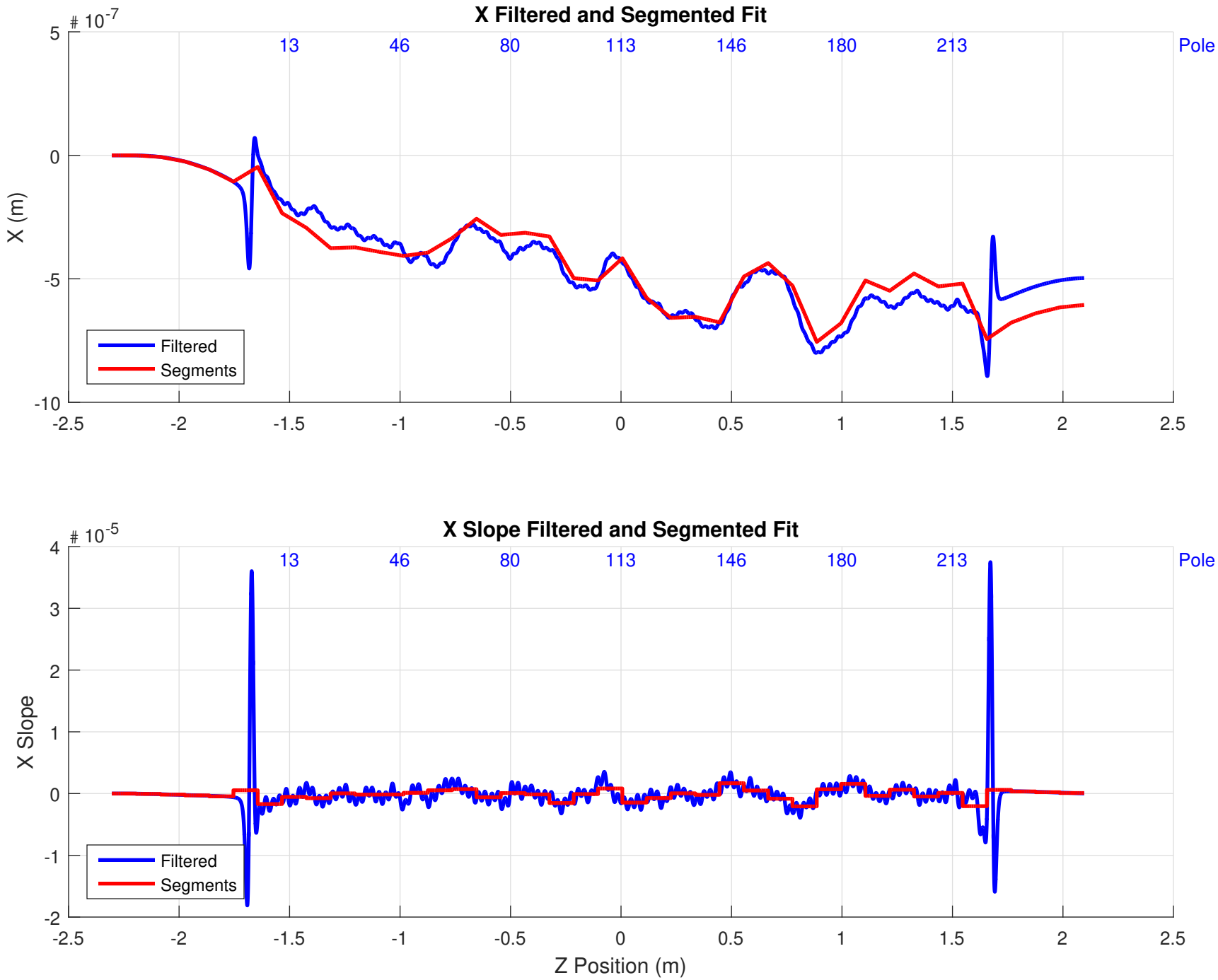

Set Gap, Required Phase Change And Fit, No Ends
Phase Change (rad)
Pole
13
46
80
113
146
180
213
Measured
Fit
Set Gap, Required Phase Change Slope From Fit, No Ends
Phase Change Slope (rad / m)
Z Position (m)

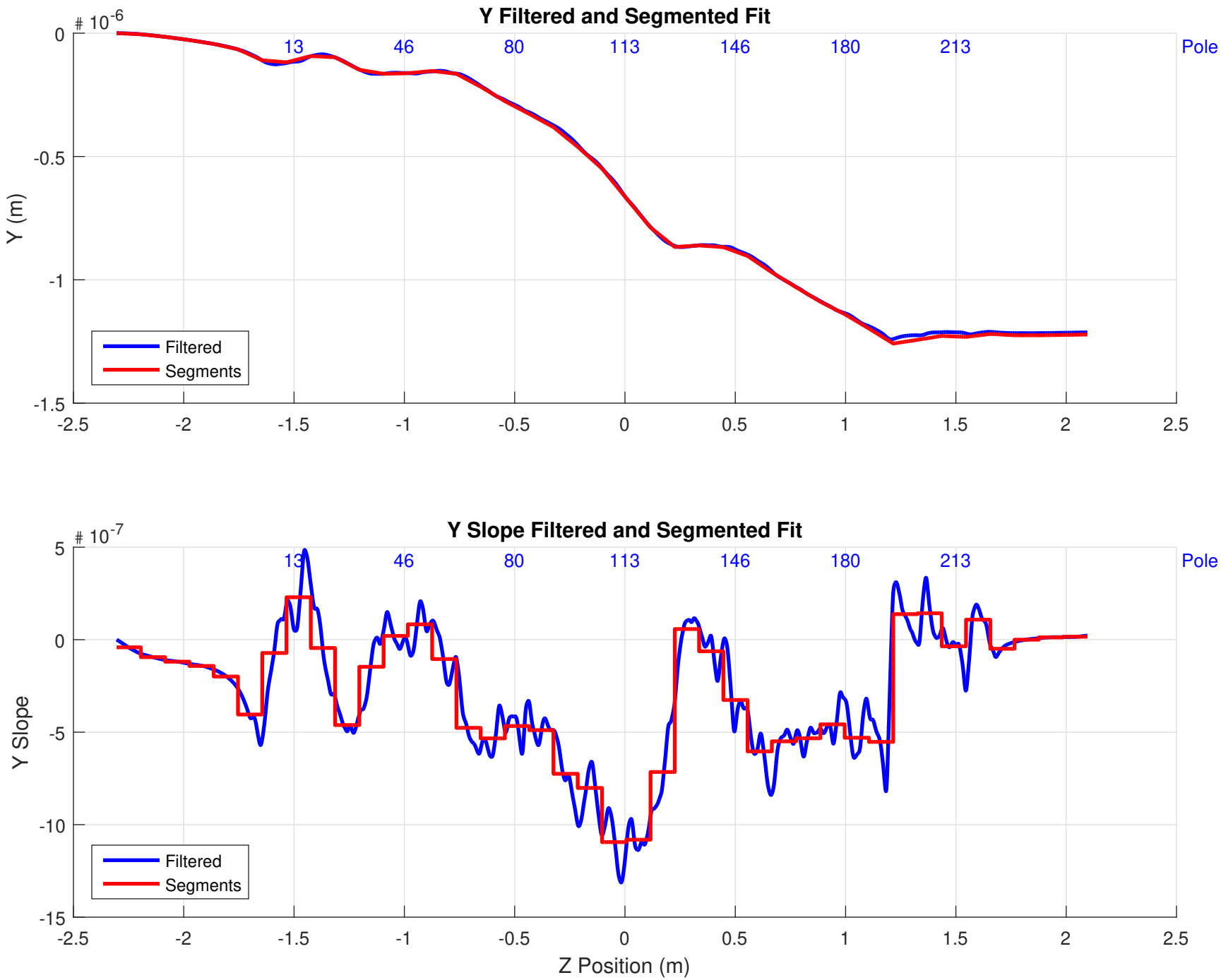

Set Gap, Gap Change Required To Correct The Phase Error, No Ends
# 10-5
Gap Change (m)
13
46
80
113
146
180
213
Pole
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

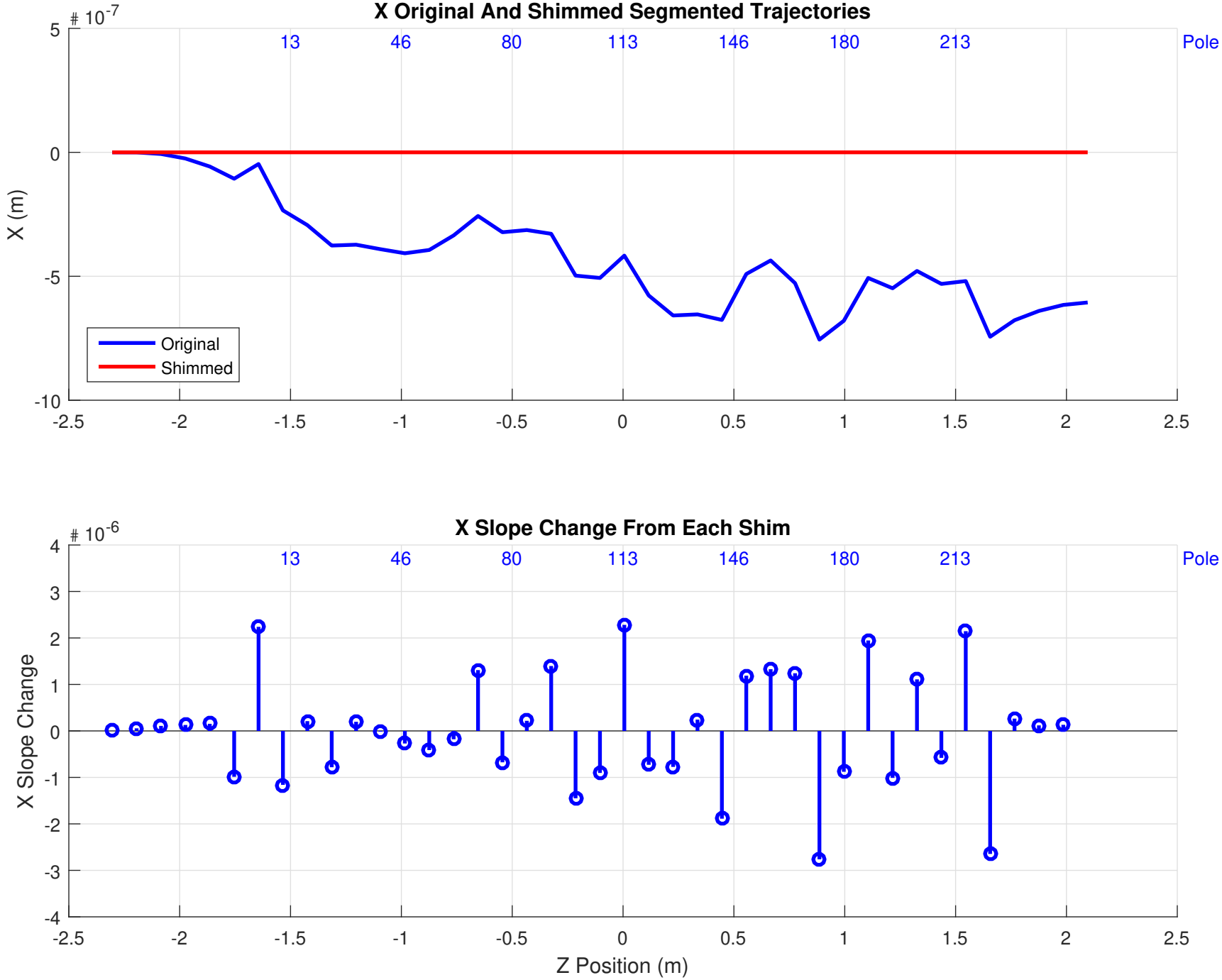

Set Gap, Required Shim X Motion, No Ends
# 10-3
Shim X Motion (m)
13
46
80
113
146
180
213
Pole
2
1
0
-1
-2
-3
-4
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

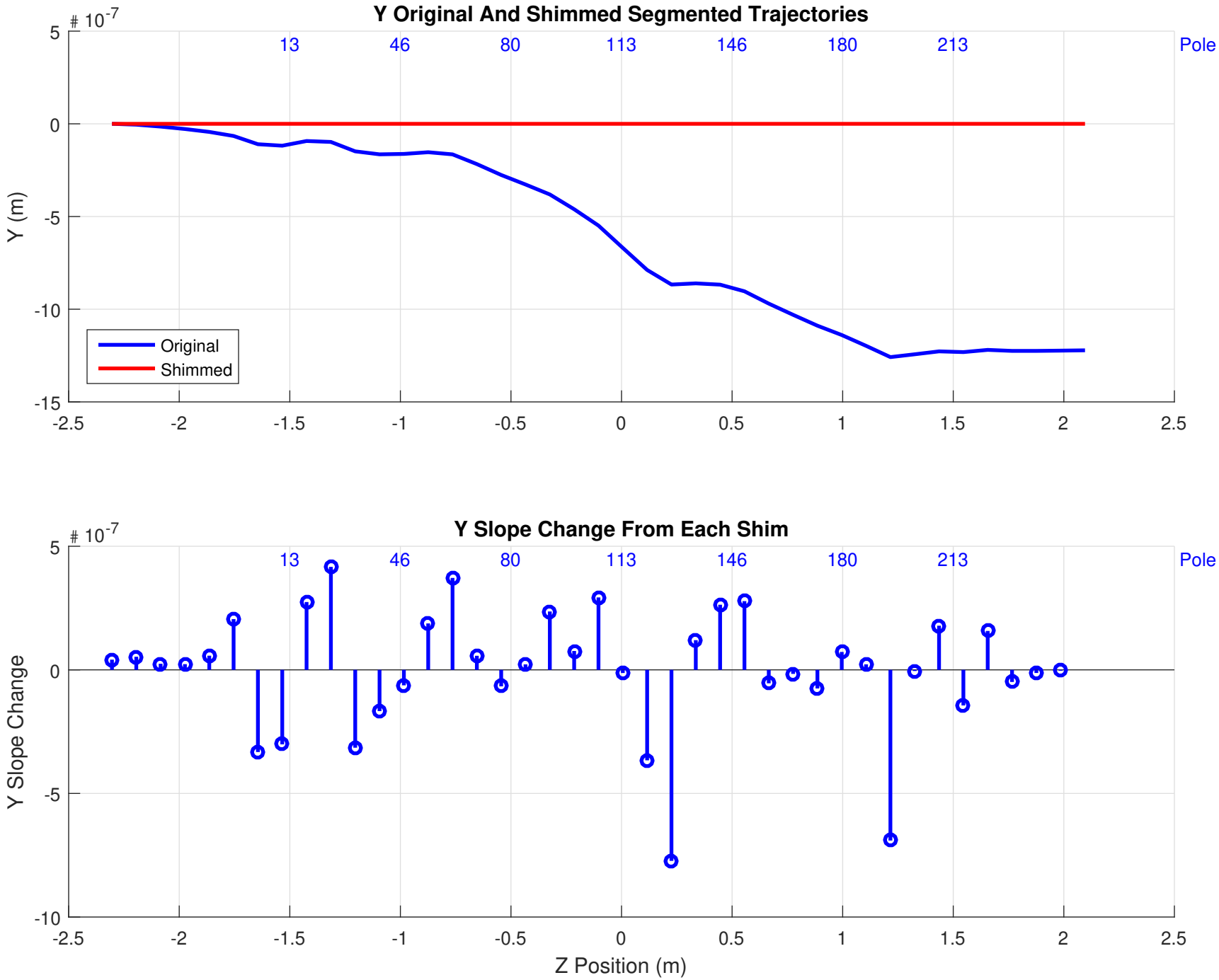

X Trajectory and Segmented Fit
# 10^-6
1
0.5
0
-0.5
-1
-1.5
13
46
80
113
146
180
213
Pole
X (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)
Trajectory
Filtered
Segments

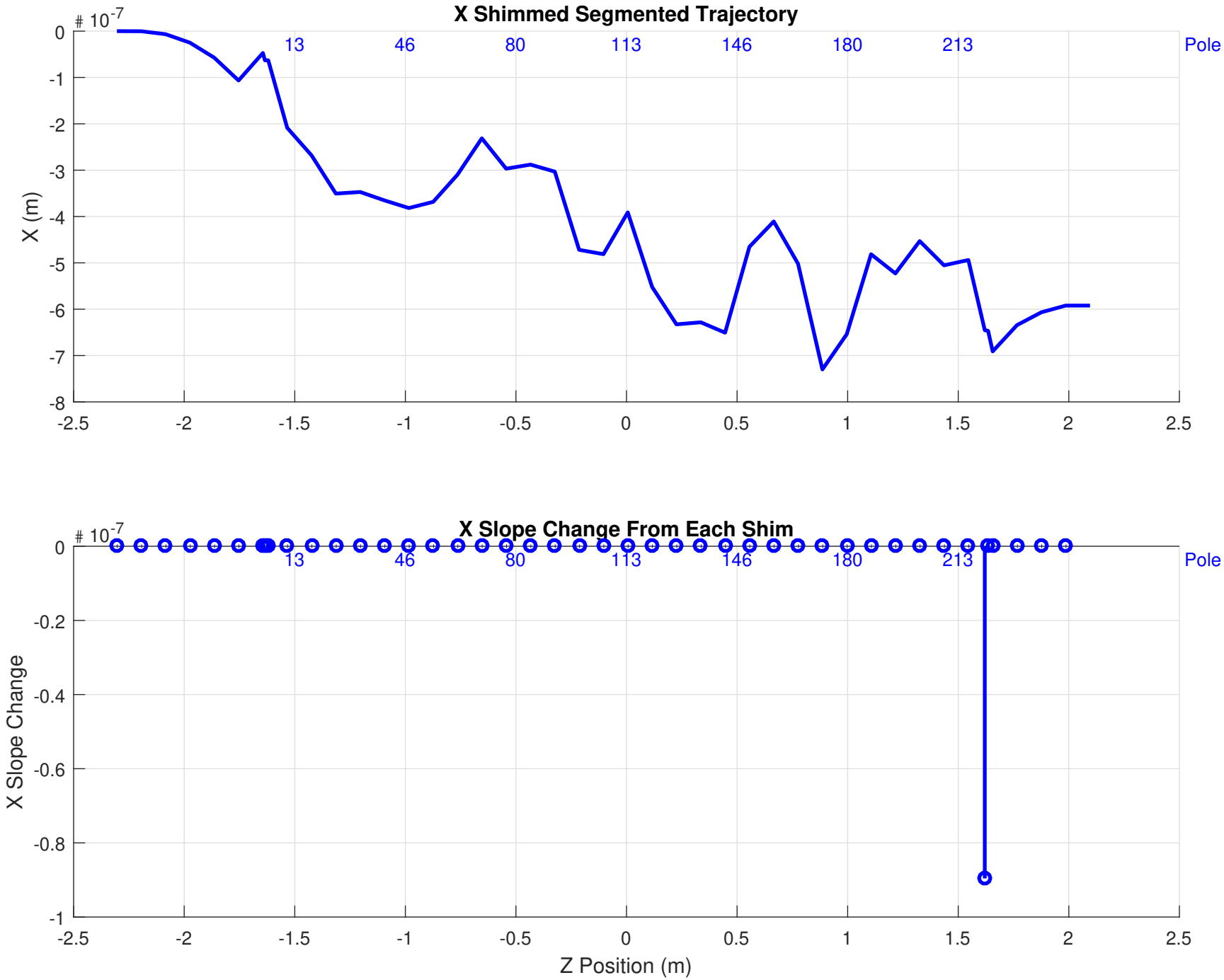

Y Trajectory and Segmented Fit
# 10-6
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
Y (m)
13
46
80
113
146
180
213
Pole
Trajectory
Filtered
Segments
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)

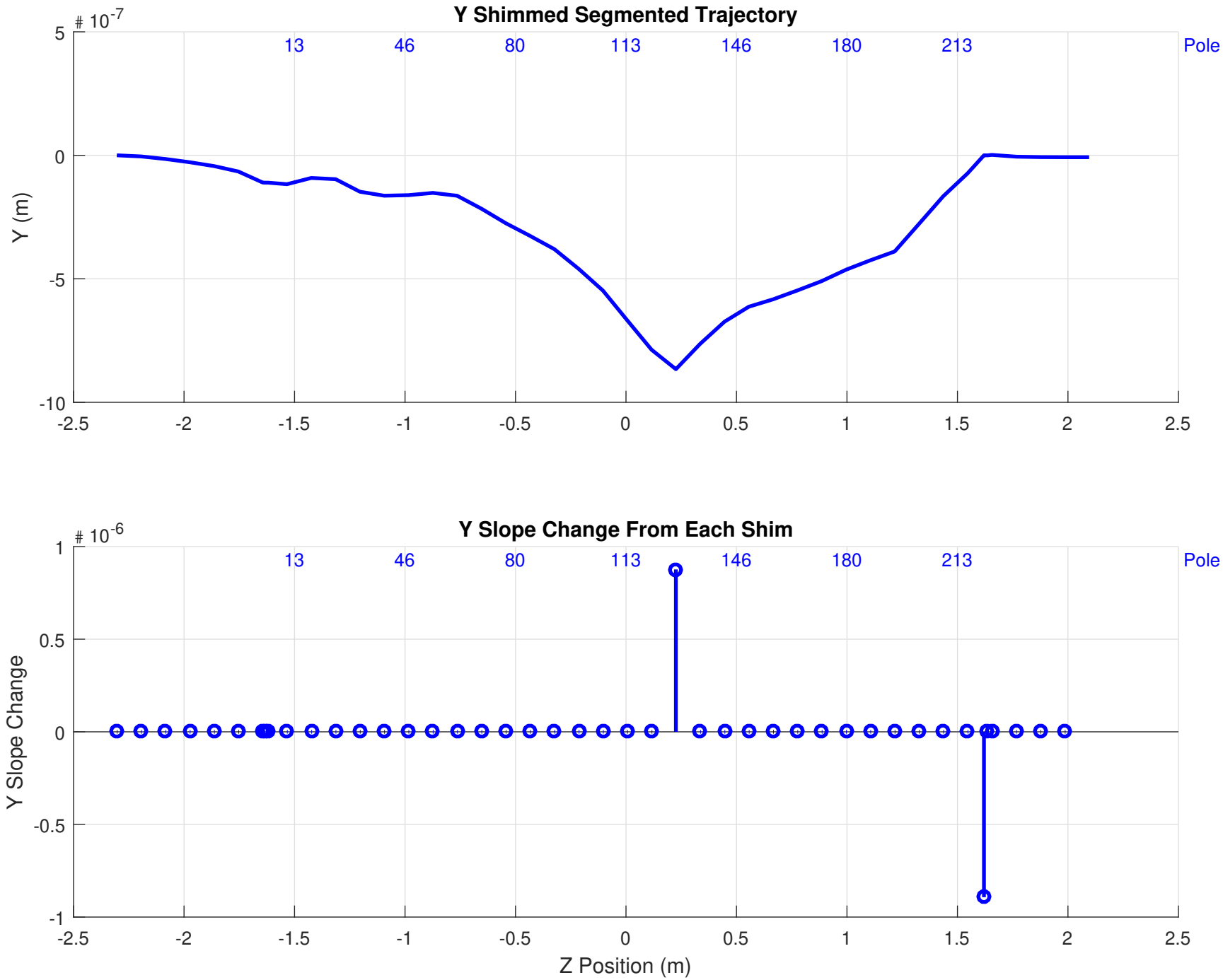

X Filtered and Segmented Fit
# 10^-7
5
0
-5
-10
X (m)
13
46
80
113
146
180
213
Pole
Filtered
Segments
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
X Slope Filtered and Segmented Fit
# 10^-5
4
3
2
1
0
-1
-2
X Slope
Z Position (m)


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


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


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


Y Shimmed Segmented Trajectory
# 10^-7
5
0
-5
-10
Y (m)
13
46
80
113
146
180
213
Pole
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Y Slope Change From Each Shim
# 10^-6
1
0.5
0
-0.5
-1
Y Slope Change
Z Position (m)