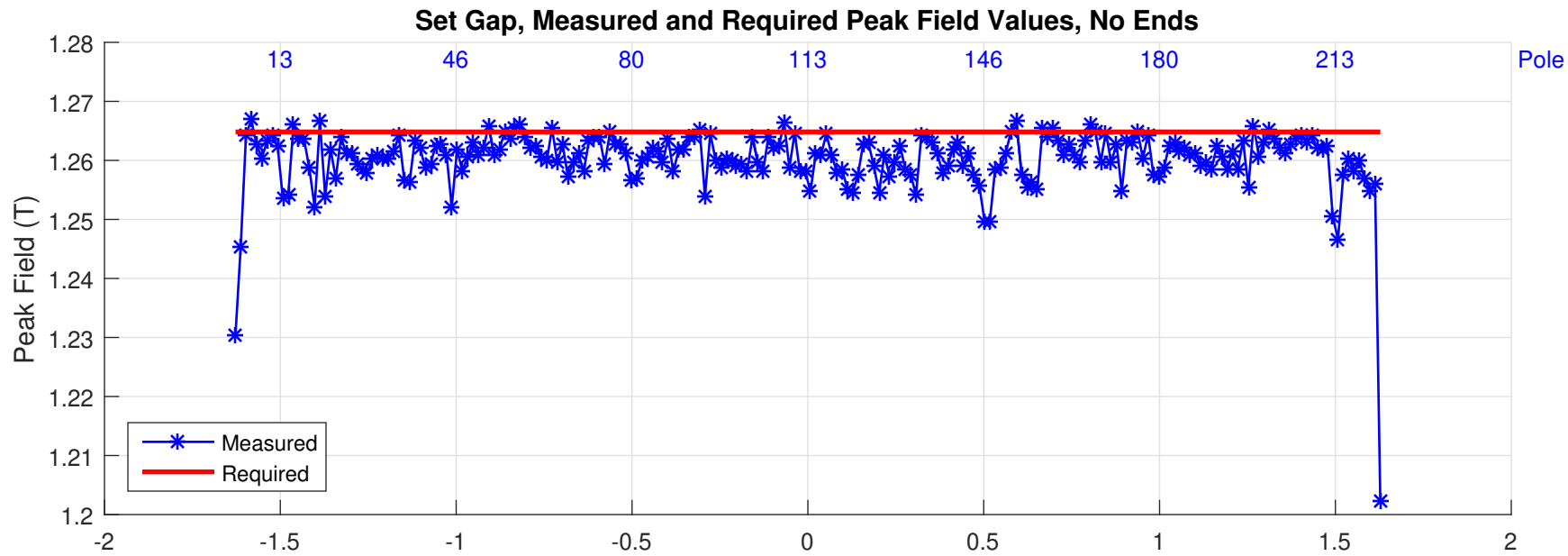
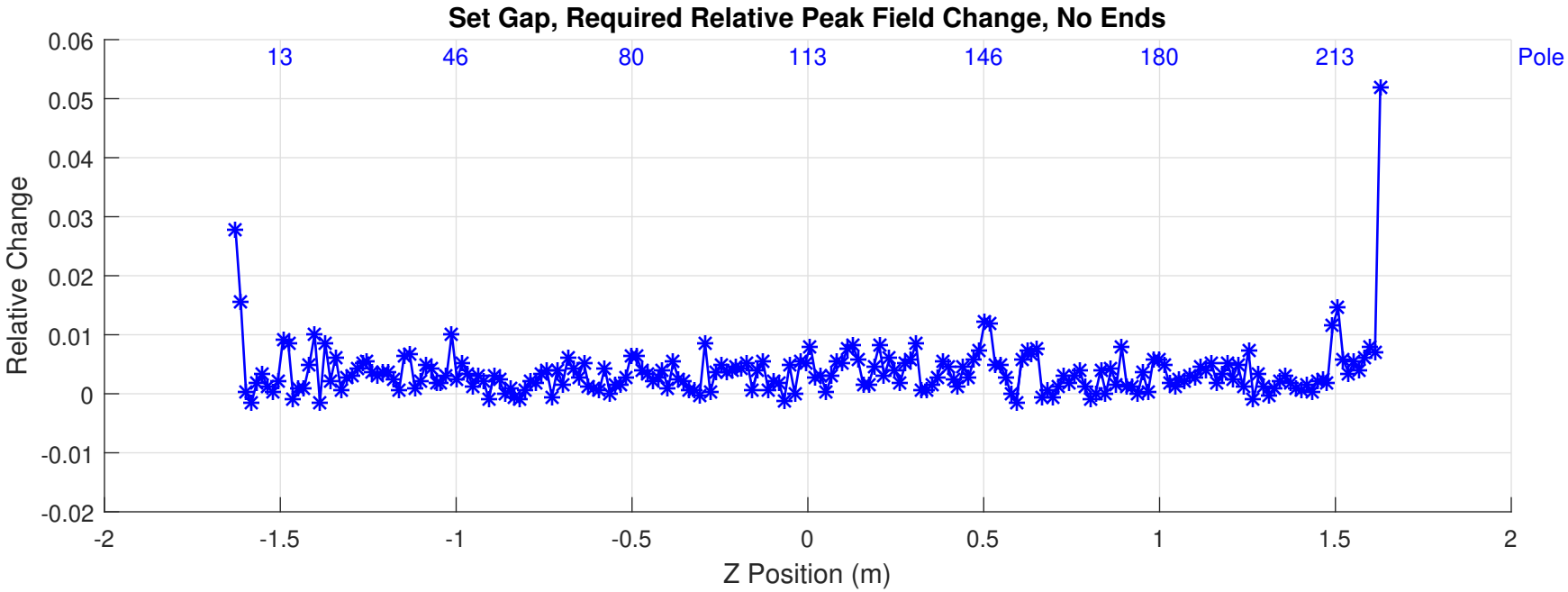
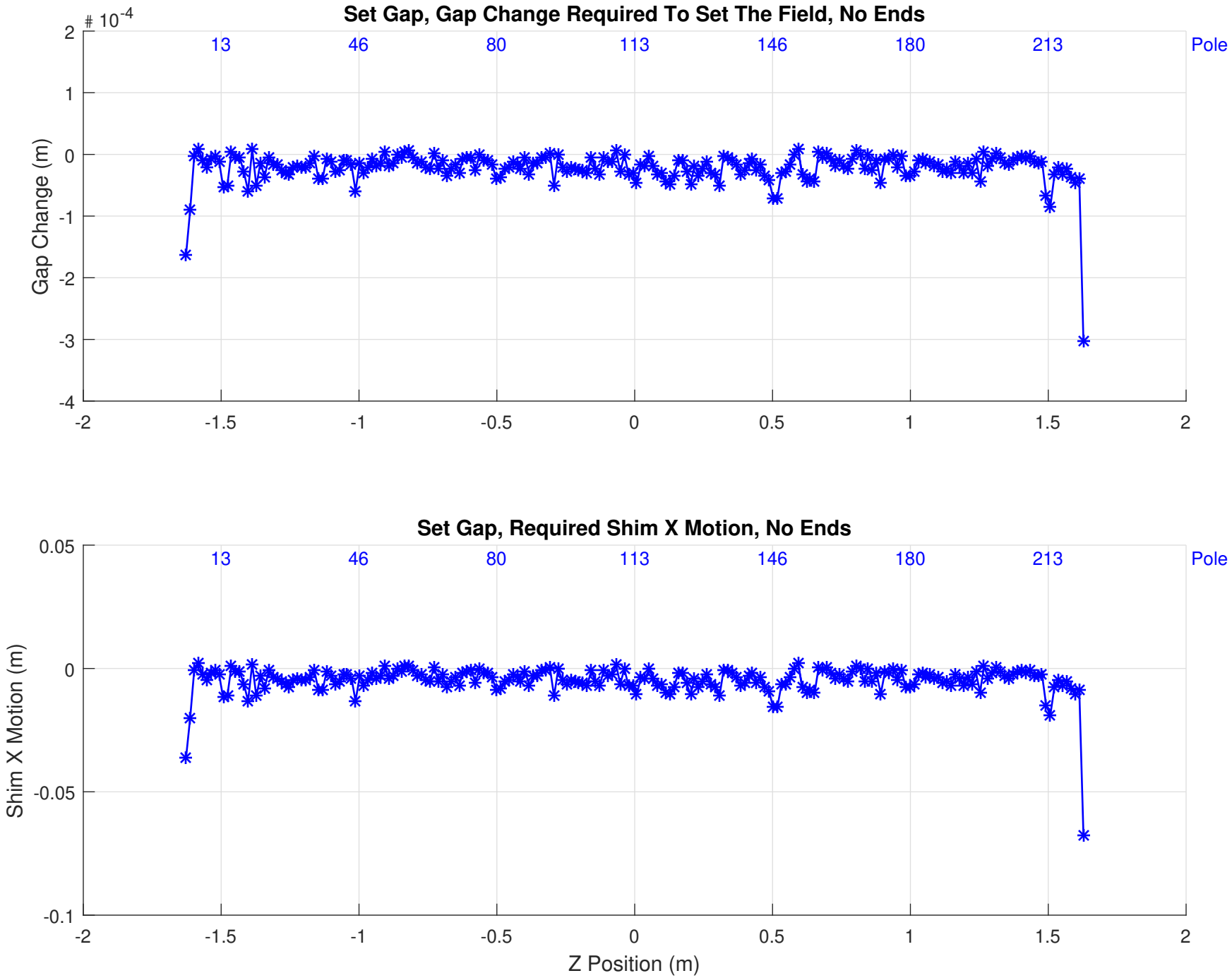
SLAC Magnetic Measurements

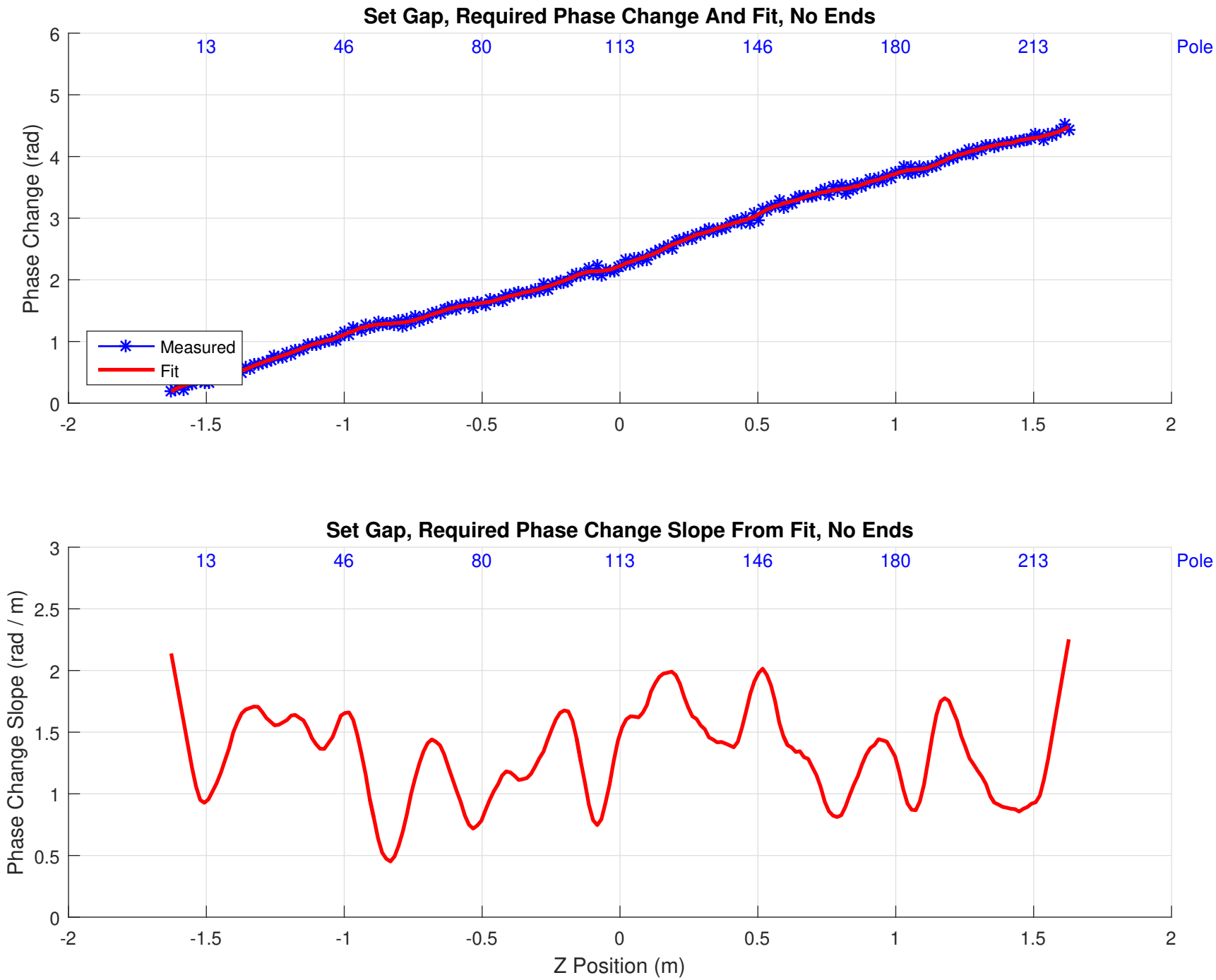
Planar Insertion Device Shim Analysis

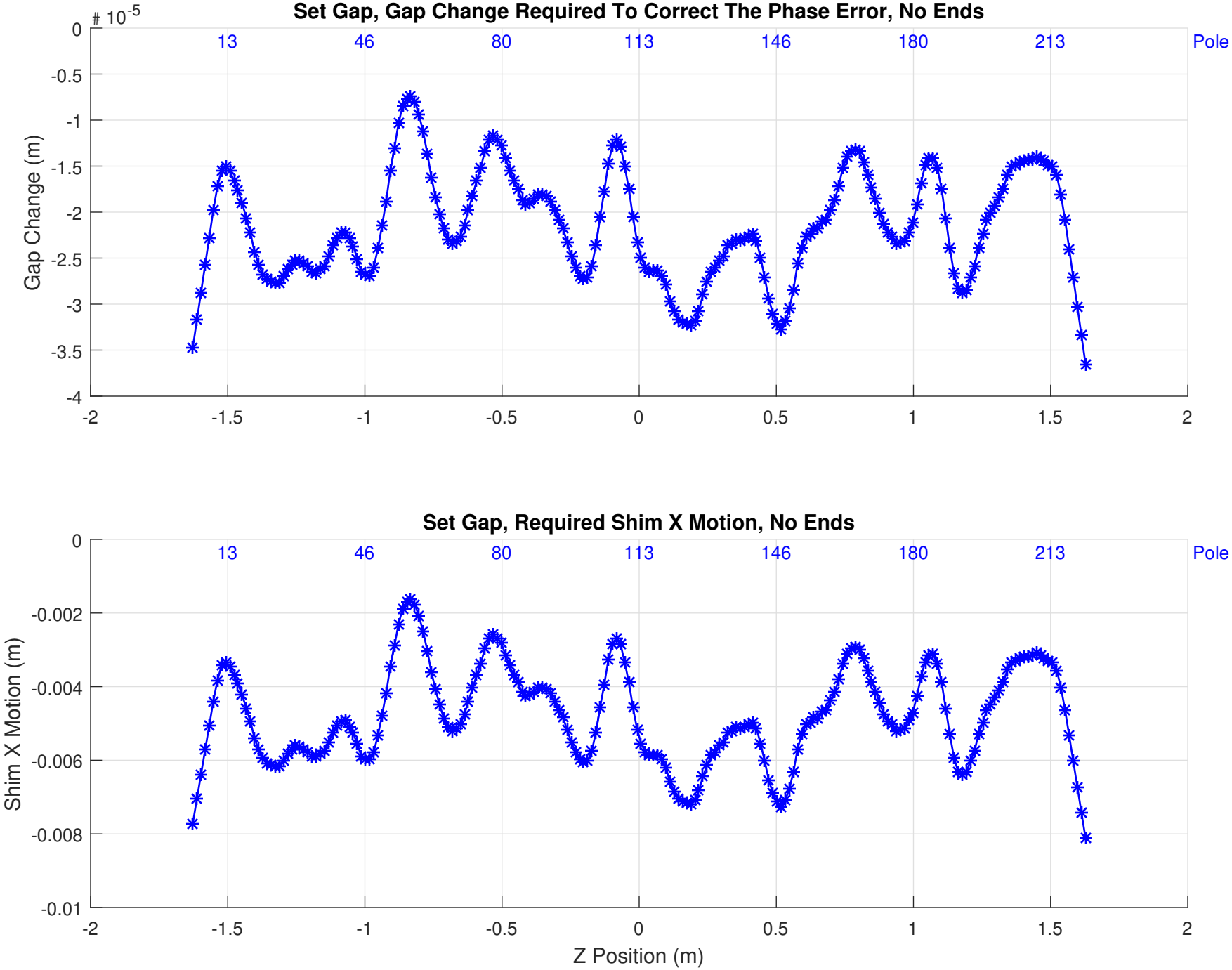
Parameters:
INPUT-FILE-DIR =s:\magdata\LCLS\Undulator\L143-112000-04\DATASET0005\Tuning\Z Scans\Run 005\
INPUT-FILE-NAME =x+00000-y+000-bscanz.dat
INPUT-FILE-TYPE =ZVXYBXYH
CORR-REQUIRED =0
GAMMA =26689
NOM-LAMBDA-U =0.03
NOM-K-VALUE =3.5
NOM-LAMBDA-R =1.5004e-10
NUM-POLES =226
NUM-END-POLES =4
CELL-LENGTH =3.656

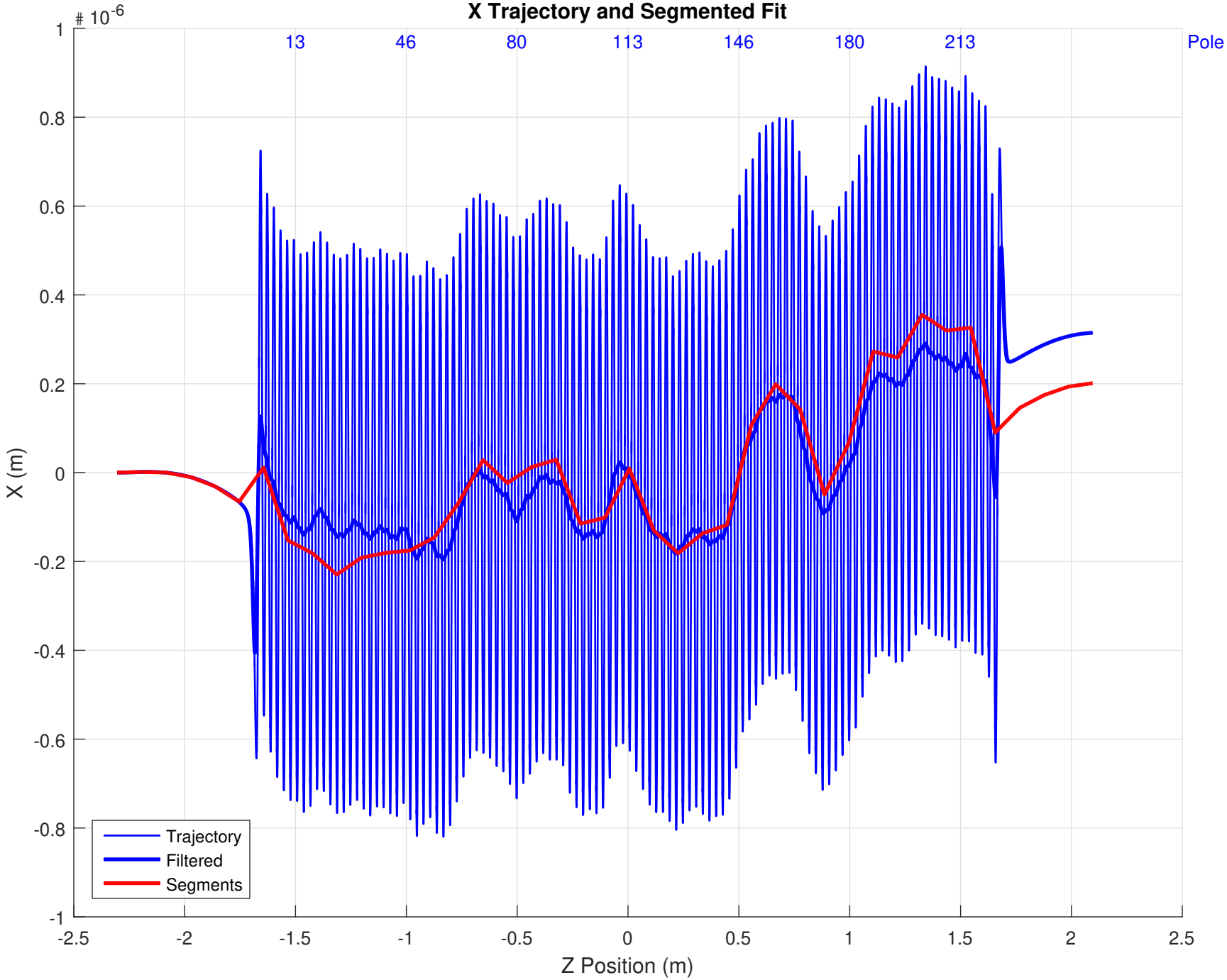

Set Gap, Measured and Required Peak Field Values, No Ends
Peak Field (T)
1.28
1.27
1.26
1.25
1.24
1.23
1.22
1.21
1.2
13
46
80
113
146
180
213
Pole
Measured
Required
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2

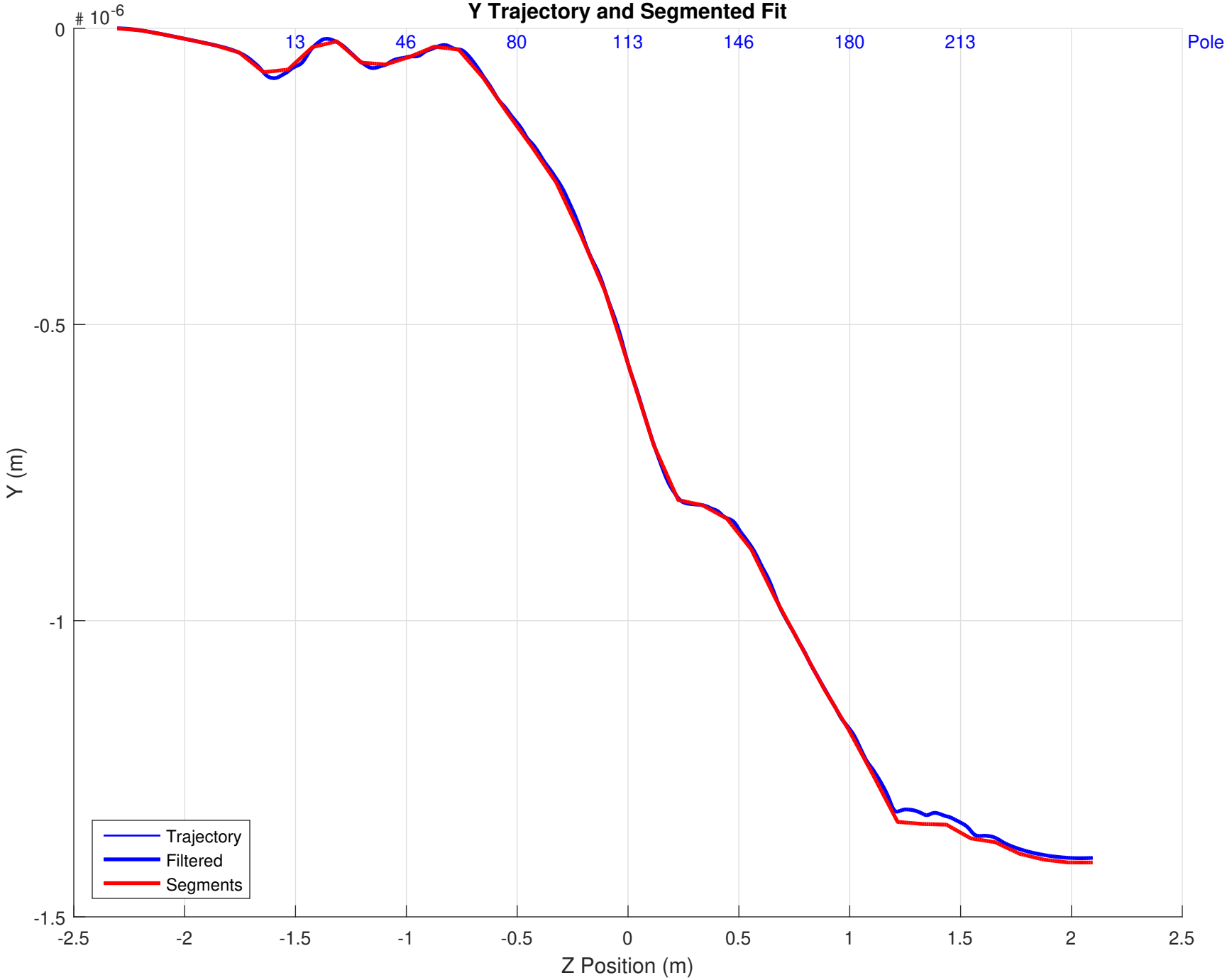

Set Gap, Required Relative Peak Field Change, No Ends
Relative Change
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02
13
46
80
113
146
180
213
Pole
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z Position (m)

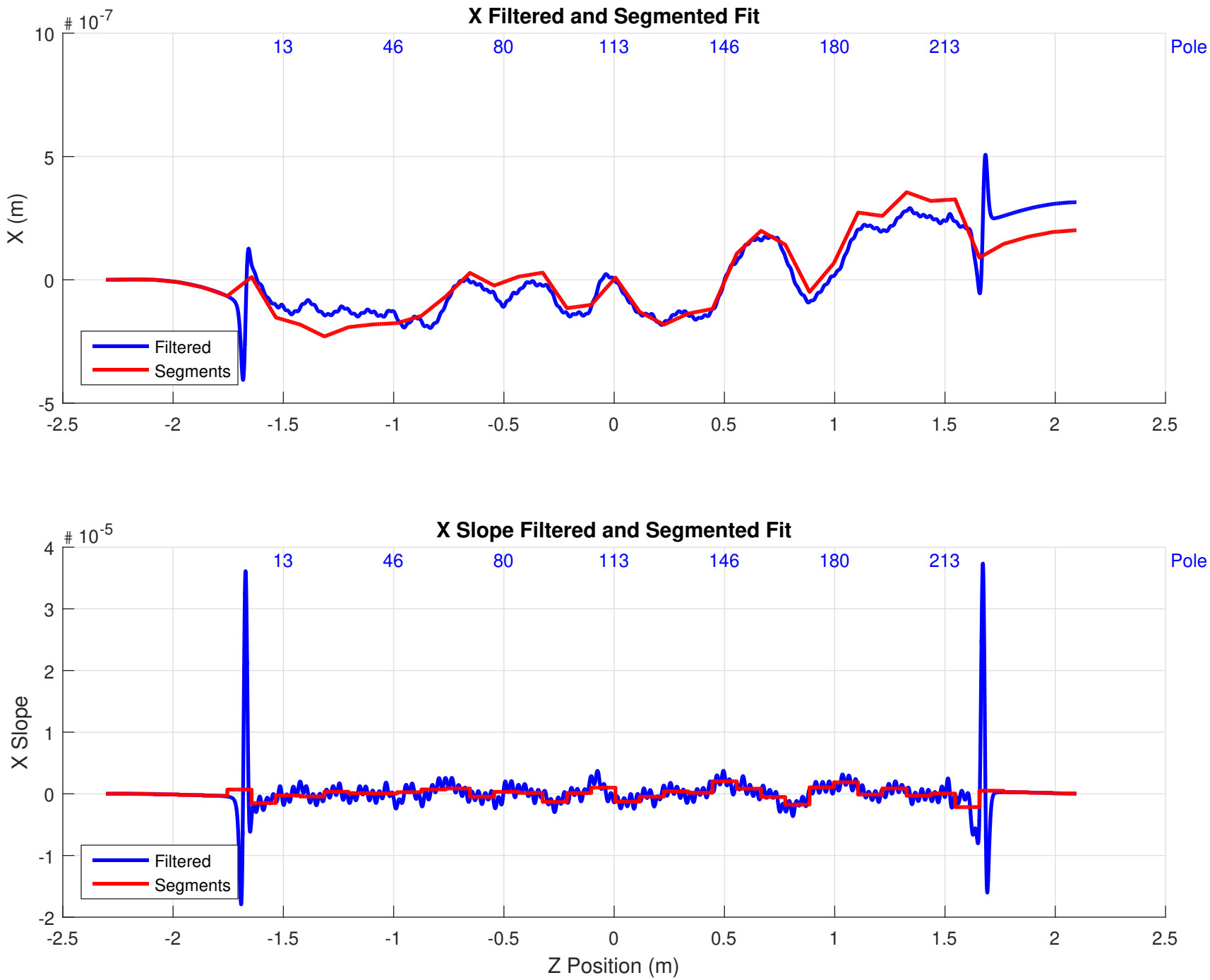

Set Gap, Gap Change Required To Set The Field, No Ends
10^-4
Gap Change (m)
13
46
80
113
146
180
213
Pole
Set Gap, Required Shim X Motion, No Ends
Shim X Motion (m)
Z Position (m)

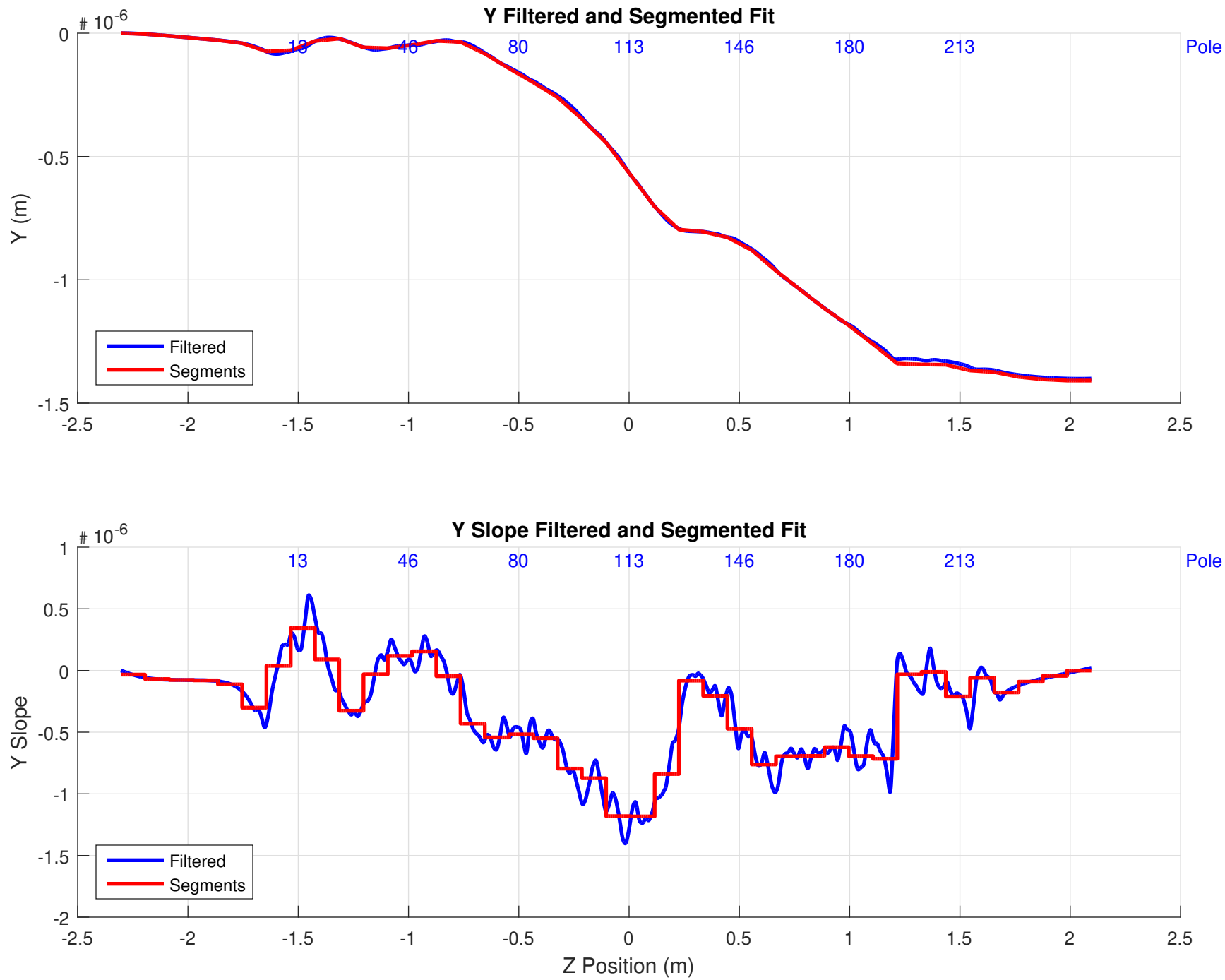

Set Gap, Required Phase Change And Fit, No Ends
13
46
80
113
146
180
213
Pole
Phase Change (rad)
Measured
Fit
Set Gap, Required Phase Change Slope From Fit, No Ends
Phase Change Slope (rad / m)
Z Position (m)

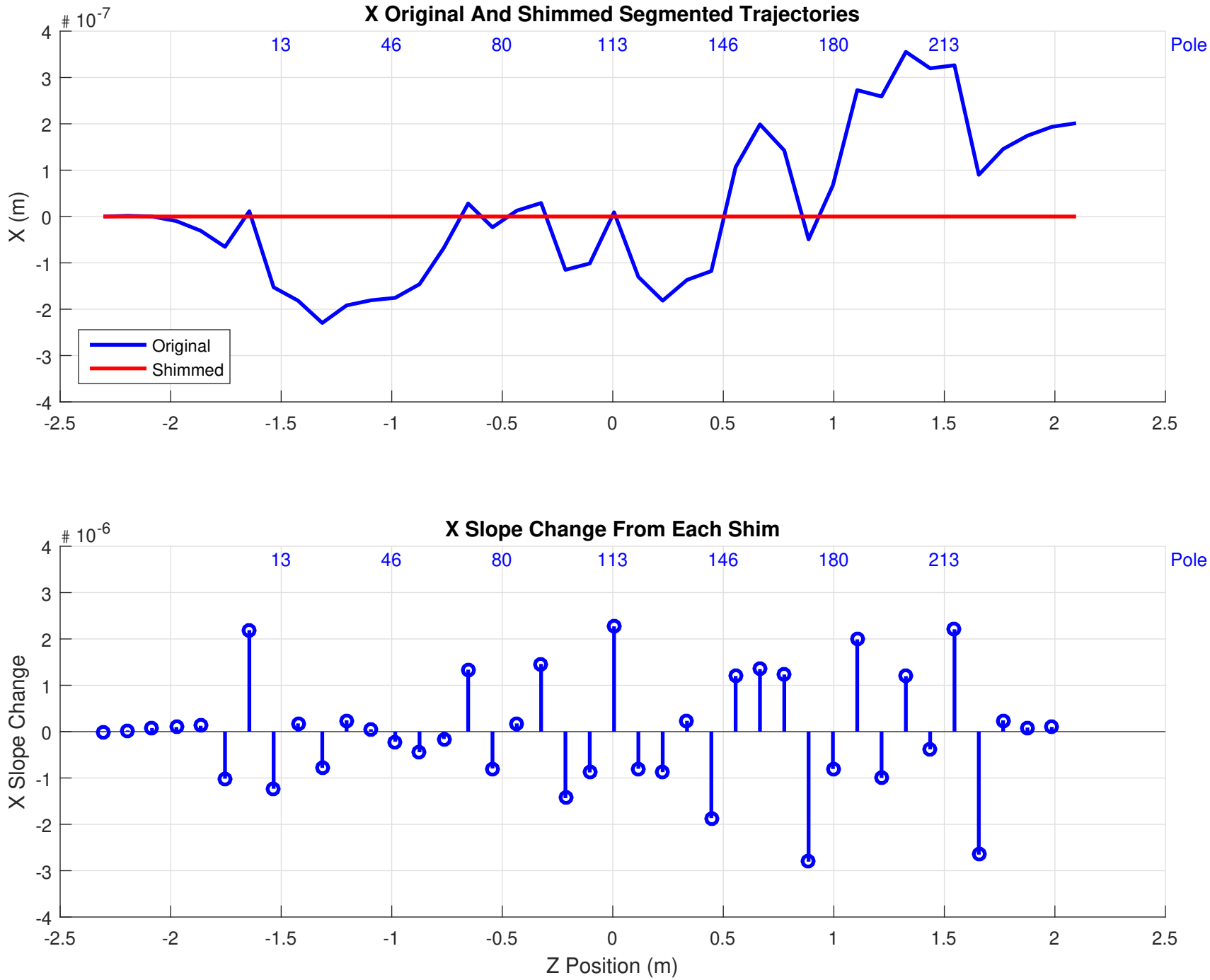

Set Gap, Gap Change Required To Correct The Phase Error, No Ends
10^-5
Gap Change (m)
Pole
13
46
80
113
146
180
213
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Set Gap, Required Shim X Motion, No Ends
Shim X Motion (m)
Z Position (m)
0
-0.002
-0.004
-0.006
-0.008
-0.01

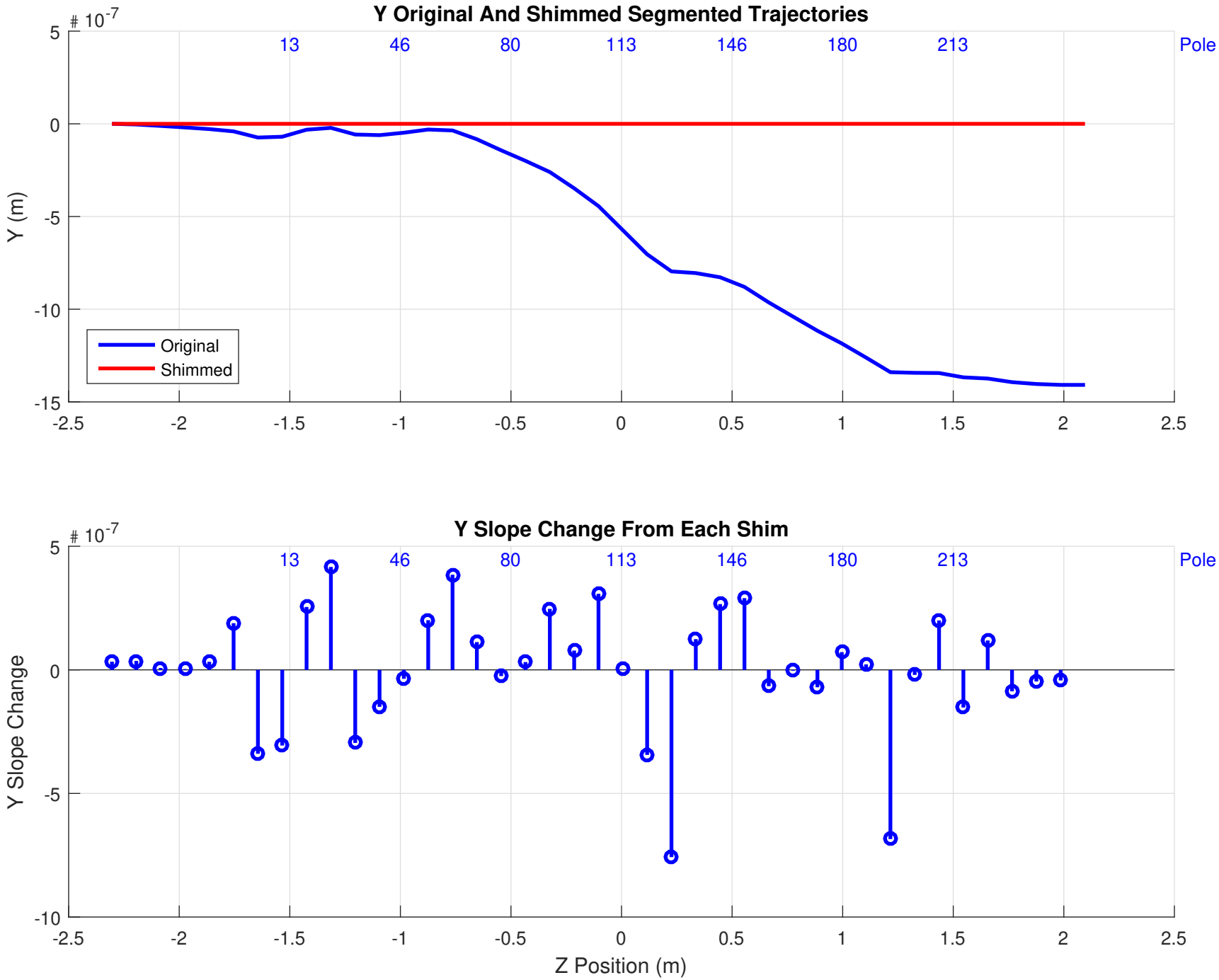

X Trajectory and Segmented Fit
10^-6
13
46
80
113
146
180
213
Pole
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
X (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Z Position (m)
Trajectory
Filtered
Segments

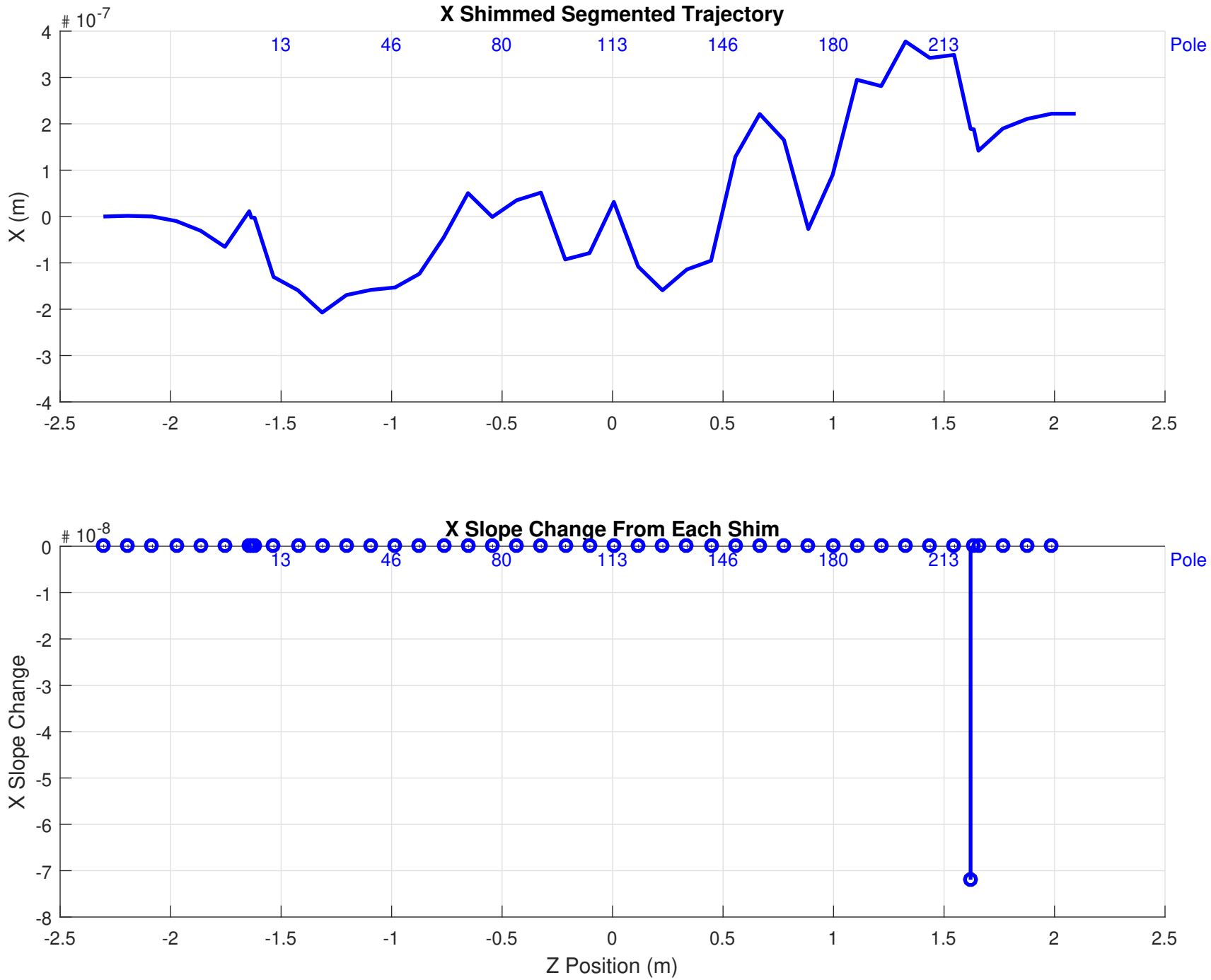

Y Trajectory and Segmented Fit
10^-6
0
-0.5
-1
-1.5
13
46
80
113
146
180
213
Pole
Y (m)
Z Position (m)
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
Trajectory
Filtered
Segments

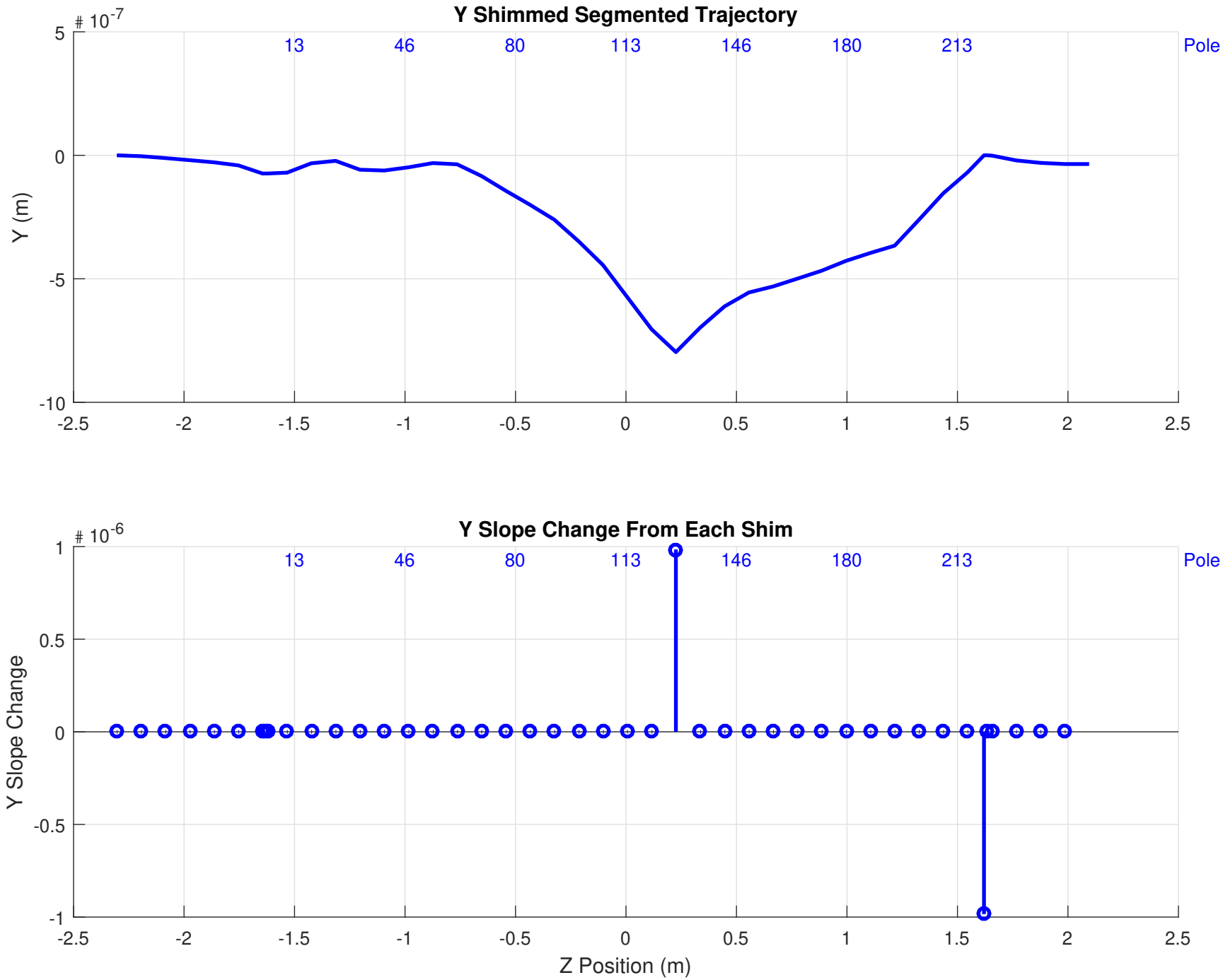

X Filtered and Segmented Fit
10^-7
10
5
0
-5
X (m)
13
46
80
113
146
180
213
Pole
Filtered
Segments
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
X Slope Filtered and Segmented Fit
10^-5
4
3
2
1
0
-1
-2
X Slope
Z Position (m)


Y Filtered and Segmented Fit
10^-6
Pole
13
46
80
113
146
180
213
Y (m)
Filtered
Segments
Y Slope Filtered and Segmented Fit
10^-6
Pole
Y Slope
Filtered
Segments
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
Pole
13
46
80
113
146
180
213
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
10-8
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)