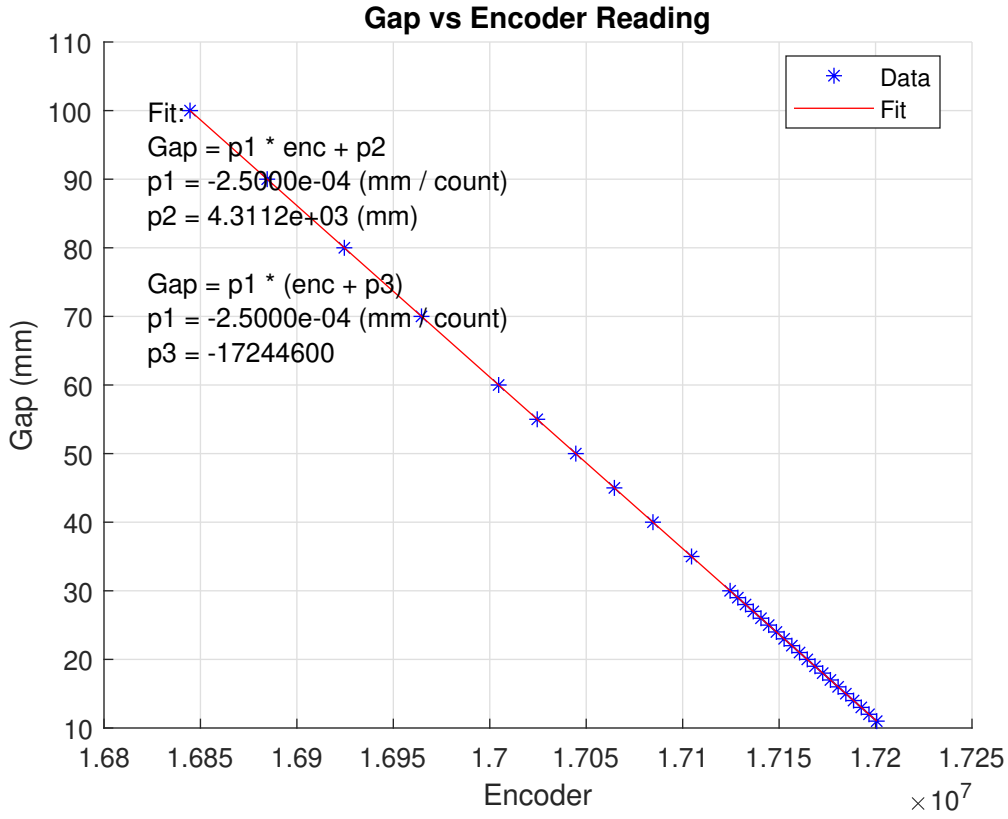
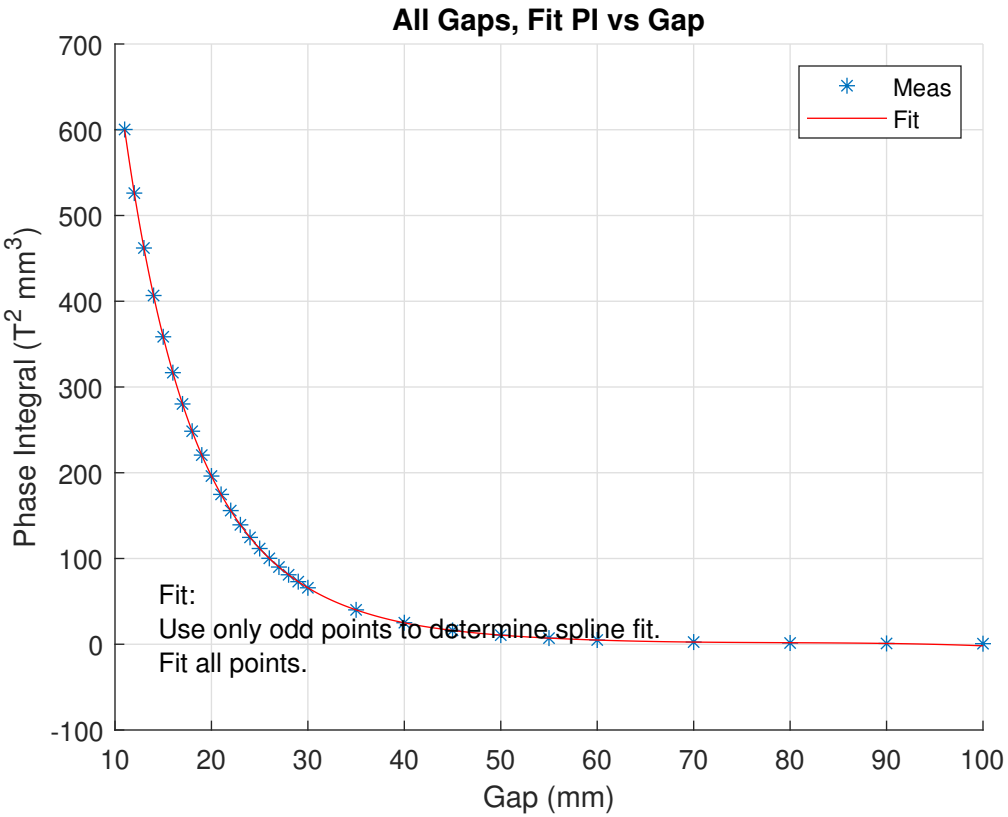
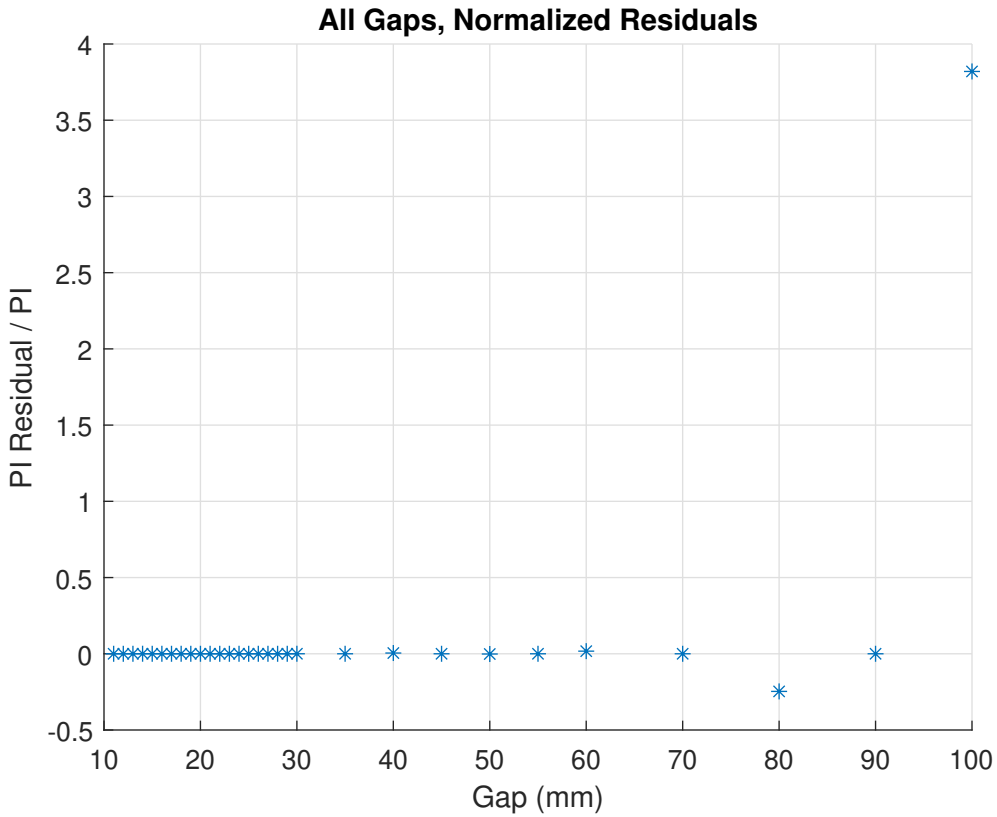
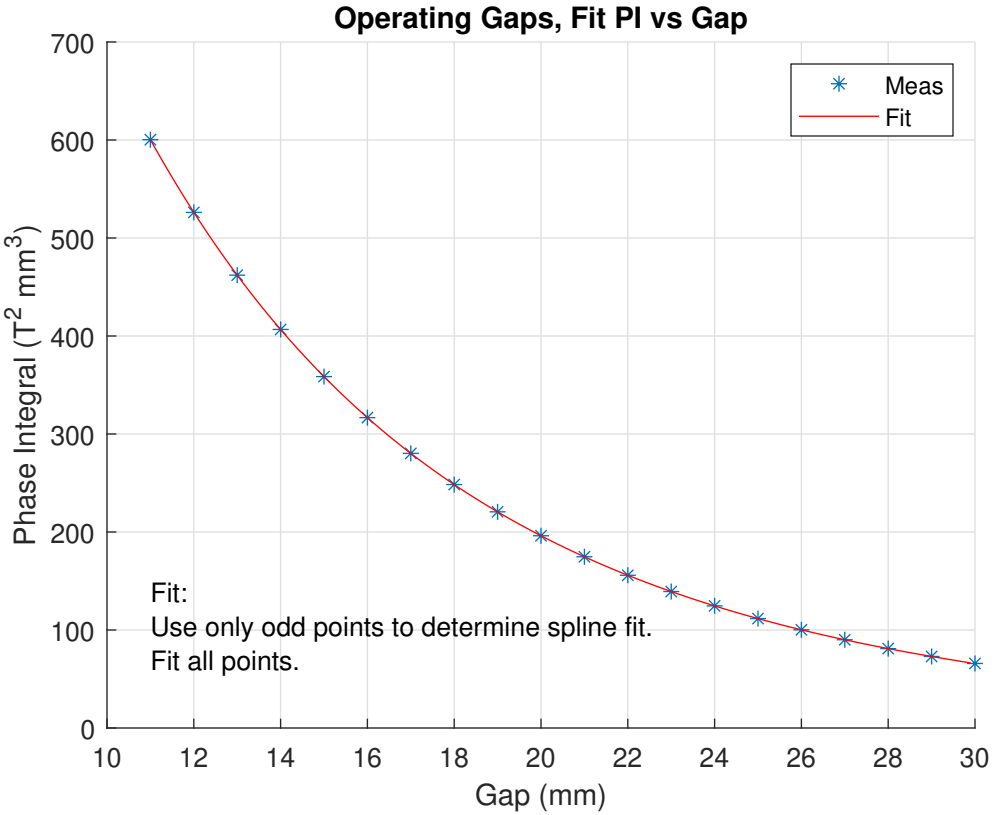
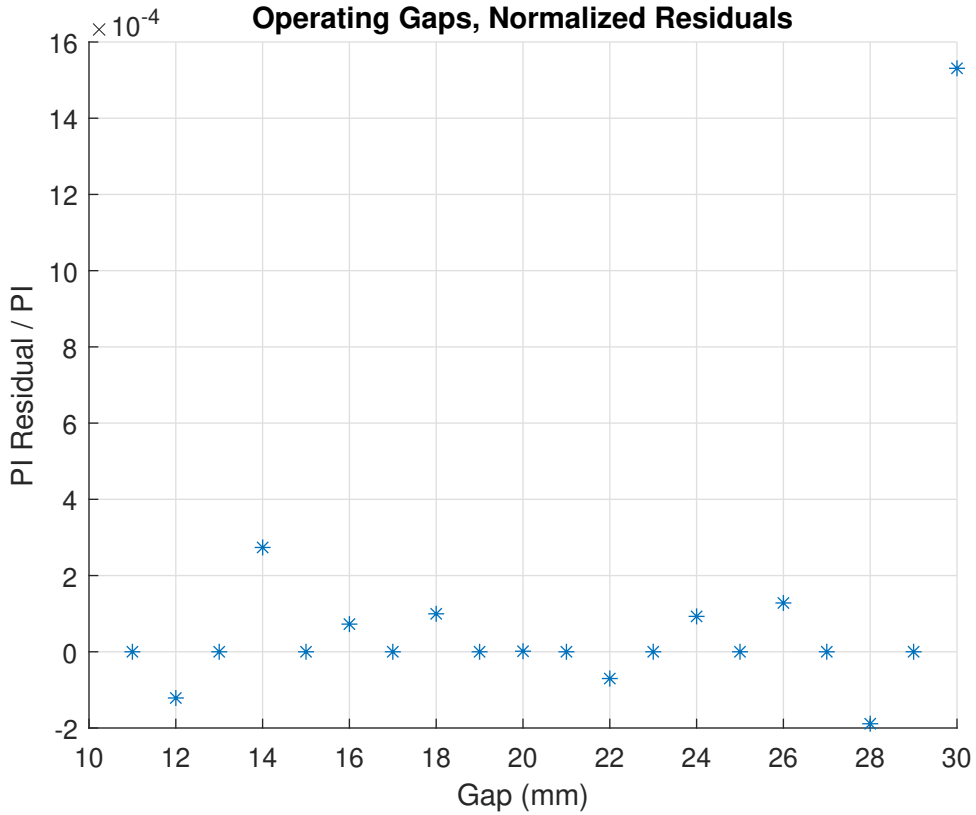
SLAC Magnetic Measurements#
Date: 12-07-2021#
Time: 18:45:53#

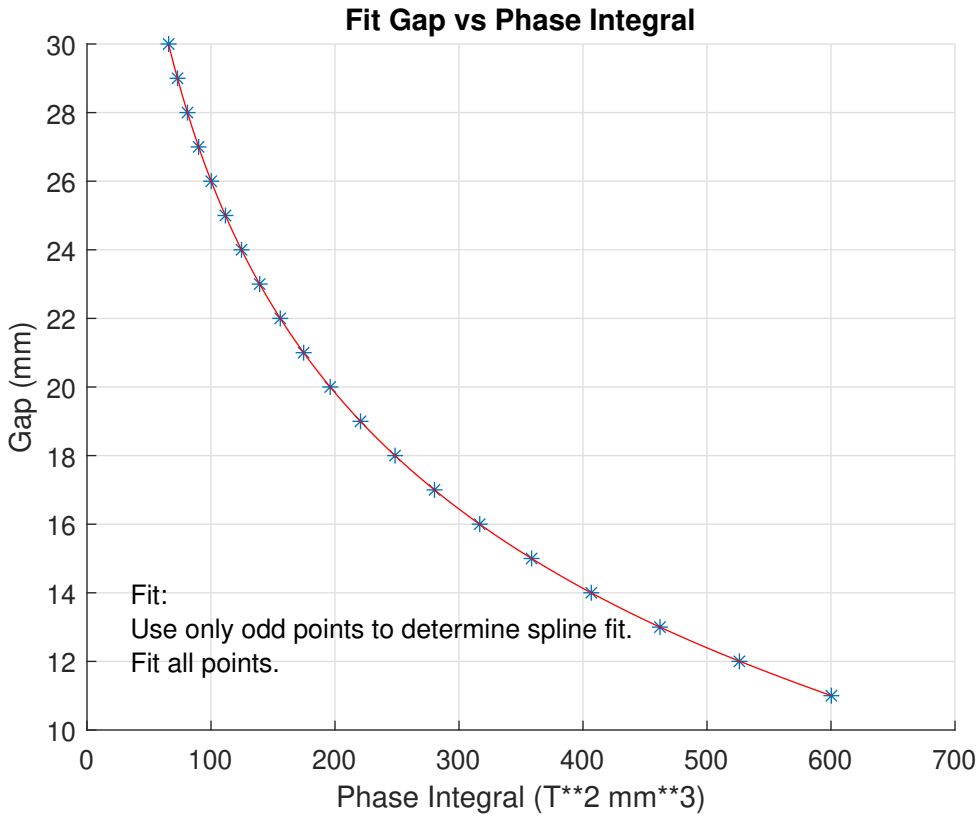

Gap vs Encoder Reading
Data
Fit
Fit:
Gap = p1 * enc + p2
p1 = -2.5000e-04 (mm / count)
p2 = 4.3112e+03 (mm)
Gap = p1 * (enc + p3)
p1 = -2.5000e-04 (mm / count)
p3 = -17244600
Gap (mm)
Encoder
× 10^7
110
100
90
80
70
60
50
40
30
20
10
1.68
1.685
1.69
1.695
1.7
1.705
1.71
1.715
1.72
1.725

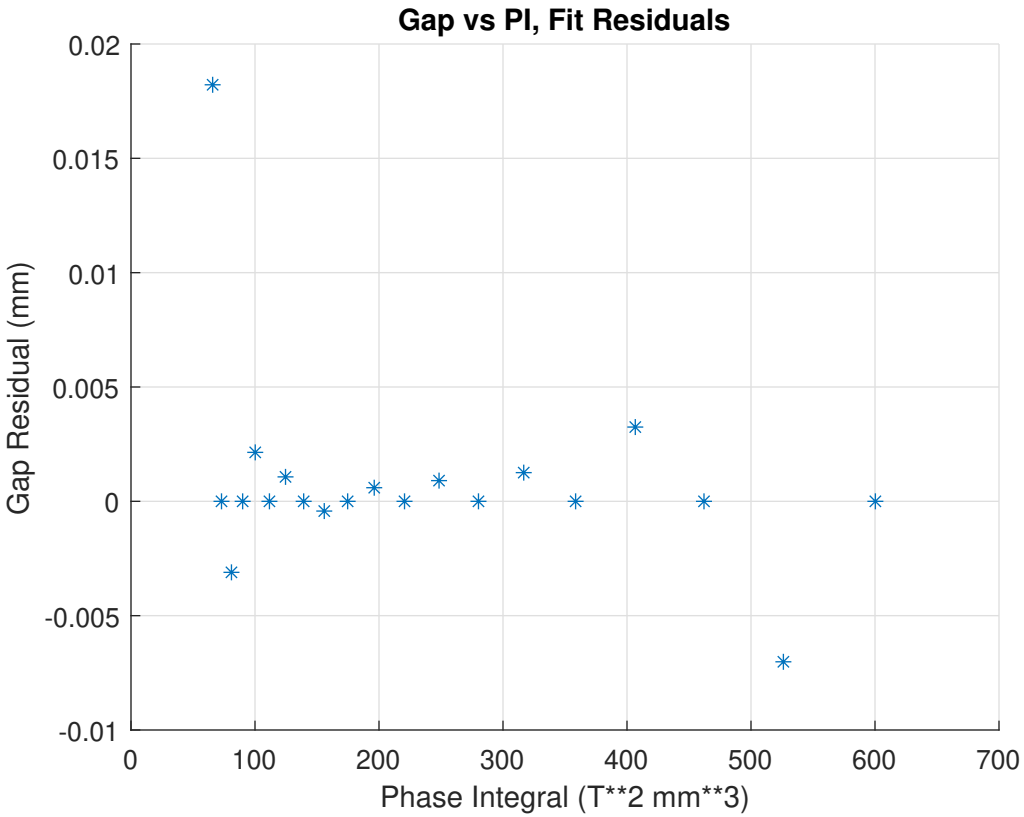

All Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T2 mm3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
700
600
500
400
300
200
100
0
-100
10
20
30
40
50
60
70
80
90
100

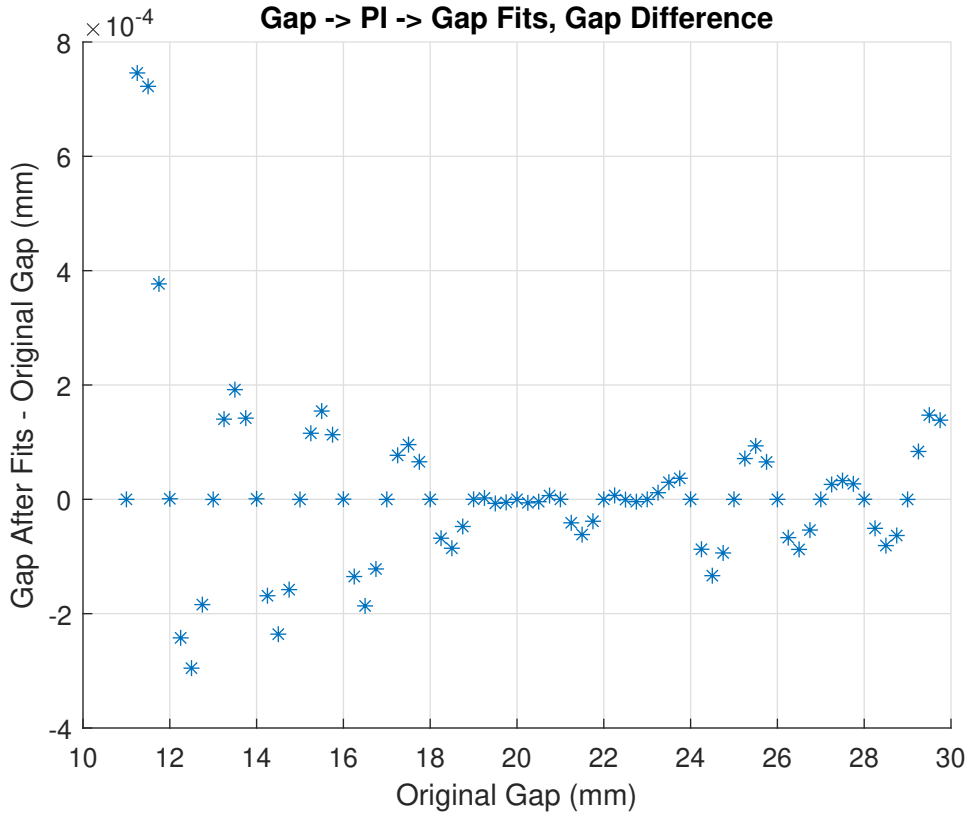

All Gaps, Normalized Residuals
PI Residual / PI
Gap (mm)
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
10
20
30
40
50
60
70
80
90
100

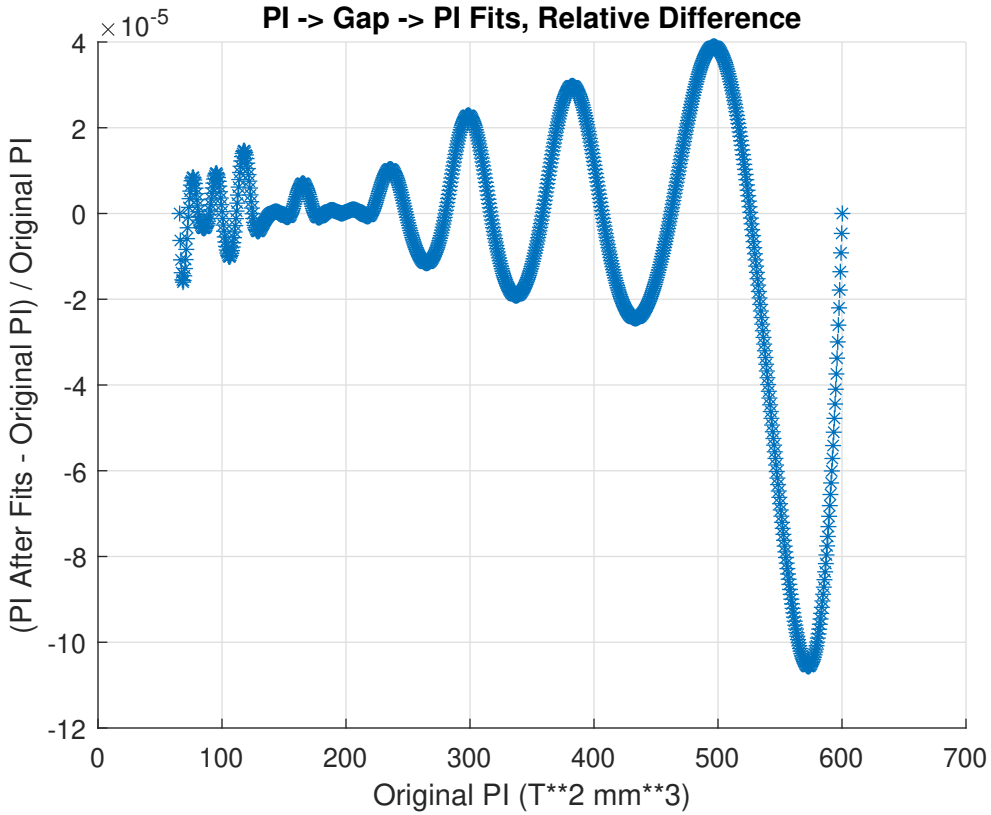

Operating Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T^2 mm^3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
0
100
200
300
400
500
600
700
10
12
14
16
18
20
22
24
26
28
30

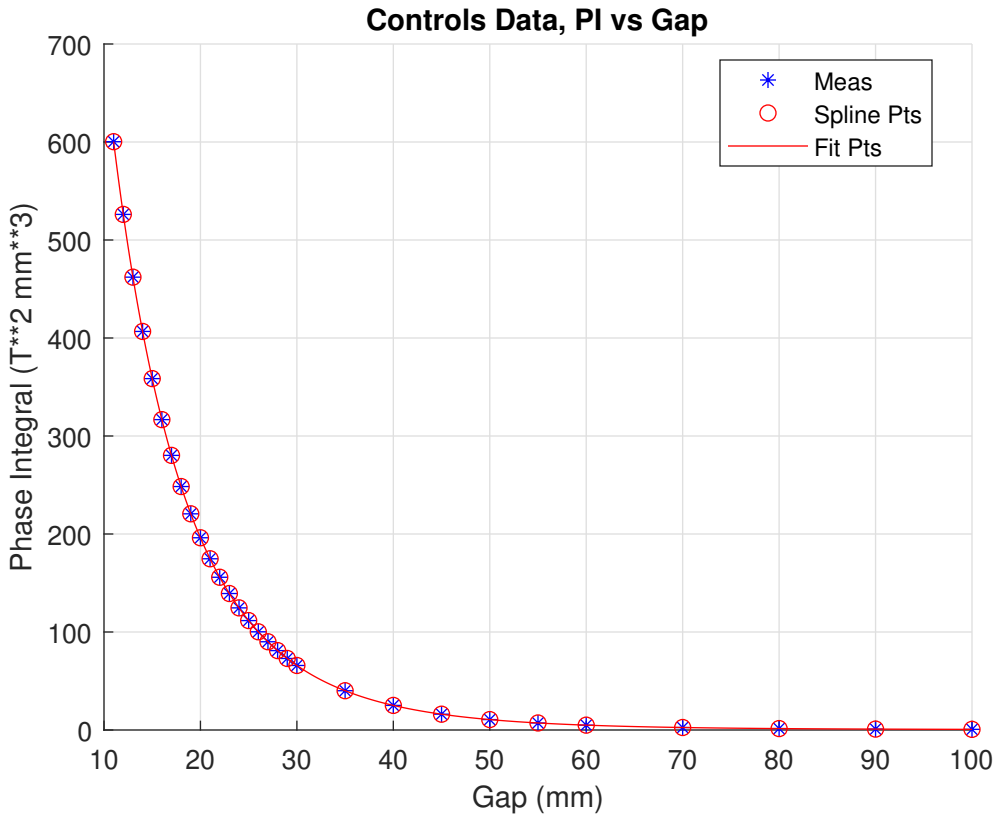

Operating Gaps, Normalized Residuals
×10-4
16
14
12
10
8
6
4
2
0
-2
PI Residual / PI
10
12
14
16
18
20
22
24
26
28
30
Gap (mm)

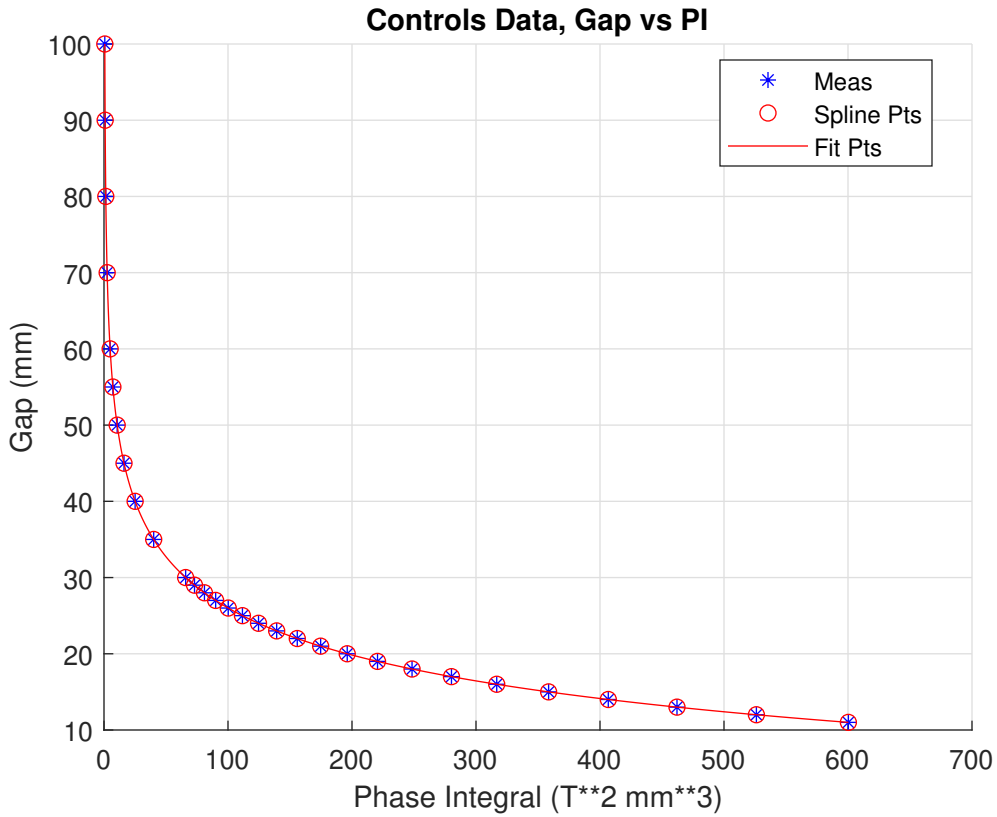

Fit Gap vs Phase Integral
Gap (mm)
Phase Integral (T**2 mm**3)
Fit:
Use only odd points to determine spline fit.
Fit all points.
30
28
26
24
22
20
18
16
14
12
10
0
100
200
300
400
500
600
700


Gap vs PI, Fit Residuals
Gap Residual (mm)
0.02
0.015
0.01
0.005
0
-0.005
-0.01
0
100
200
300
400
500
600
700
Phase Integral (T**2 mm**3)


Gap -> PI -> Gap Fits, Gap Difference
×10^-4
8
6
4
2
0
-2
-4
Gap After Fits - Original Gap (mm)
10
12
14
16
18
20
22
24
26
28
30
Original Gap (mm)


PI -> Gap -> PI Fits, Relative Difference
×10^-5
4
2
0
-2
-4
-6
-8
-10
-12
0
100
200
300
400
500
600
700
(PI After Fits - Original PI) / Original PI
Original PI (T**2 mm**3)


Controls Data, PI vs Gap
Meas
Spline Pts
Fit Pts
Phase Integral (T**2 mm**3)
Gap (mm)
700
600
500
400
300
200
100
0
10
20
30
40
50
60
70
80
90
100


Controls Data, Gap vs PI
Meas
Spline Pts
Fit Pts
Gap (mm)
Phase Integral (T**2 mm**3)
100
90
80
70
60
50
40
30
20
10
0
100
200
300
400
500
600
700