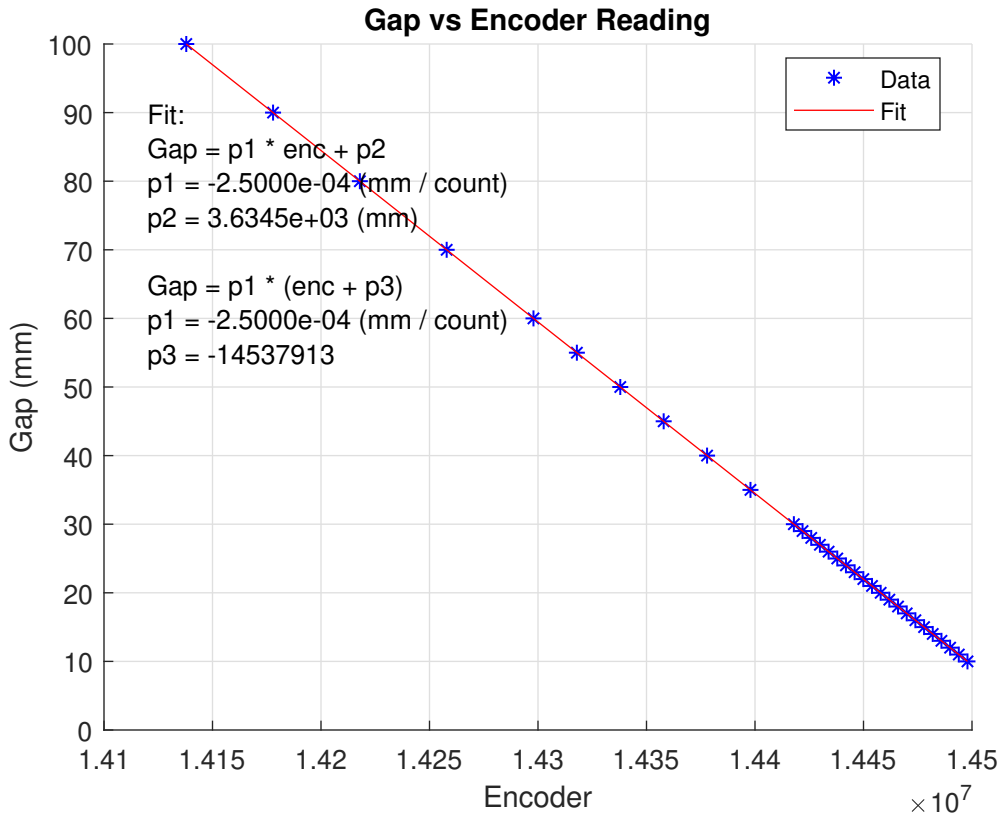
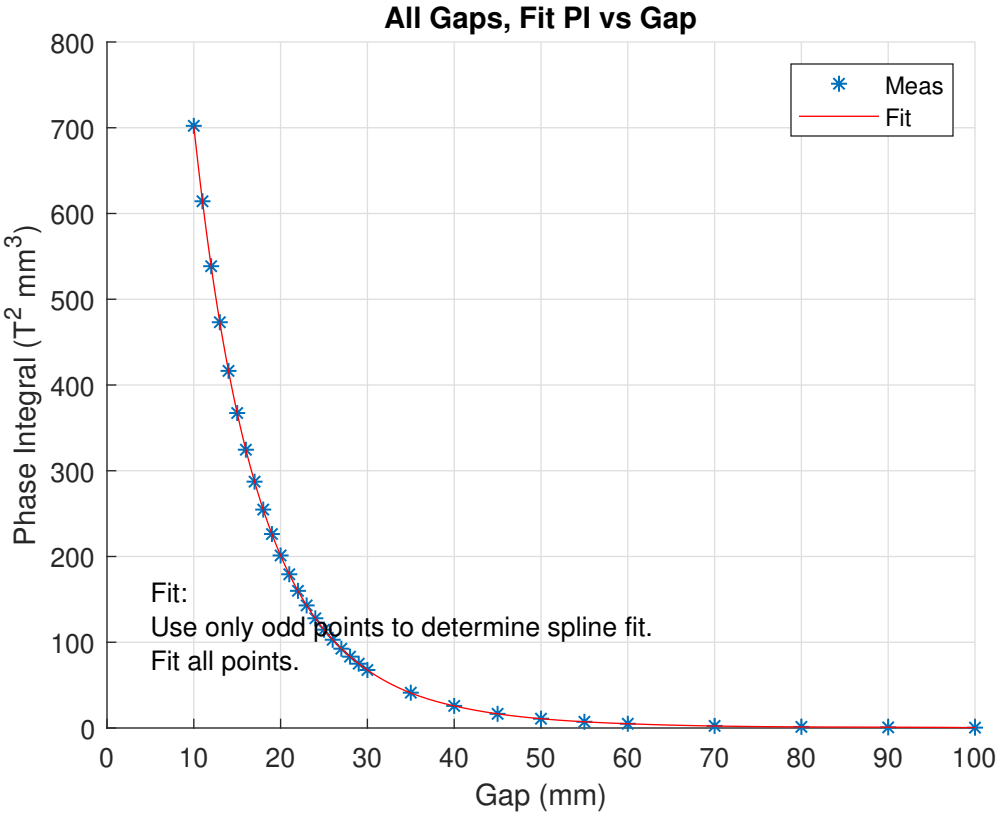
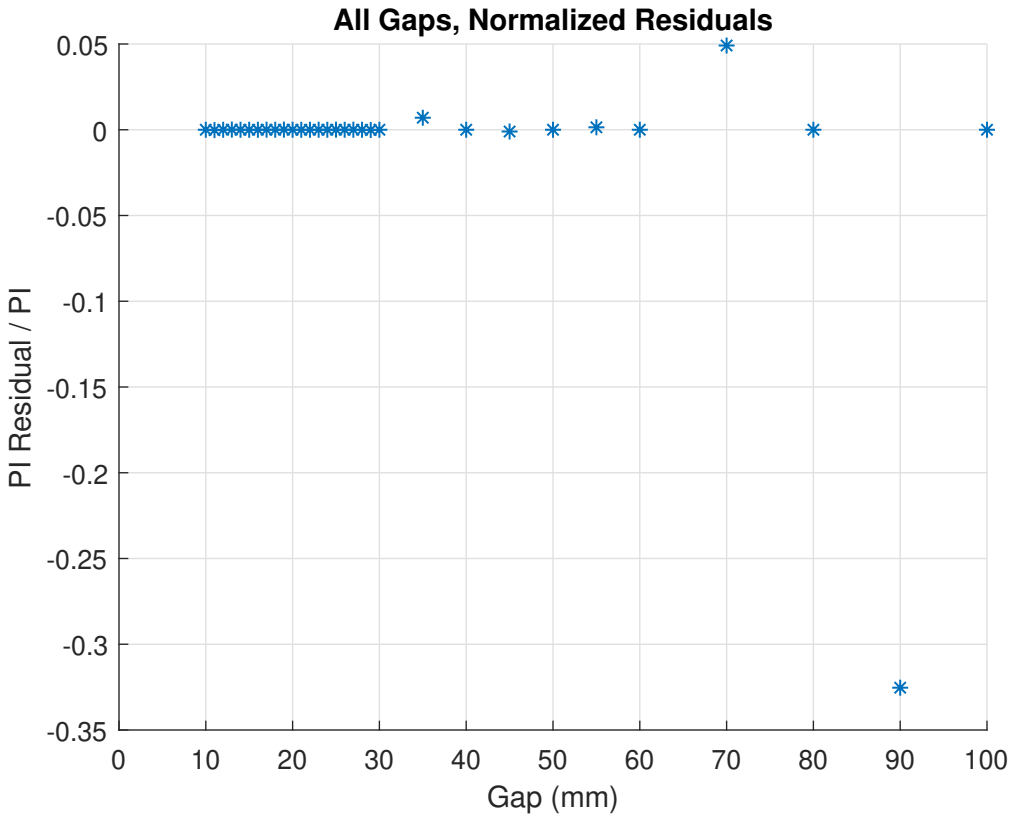
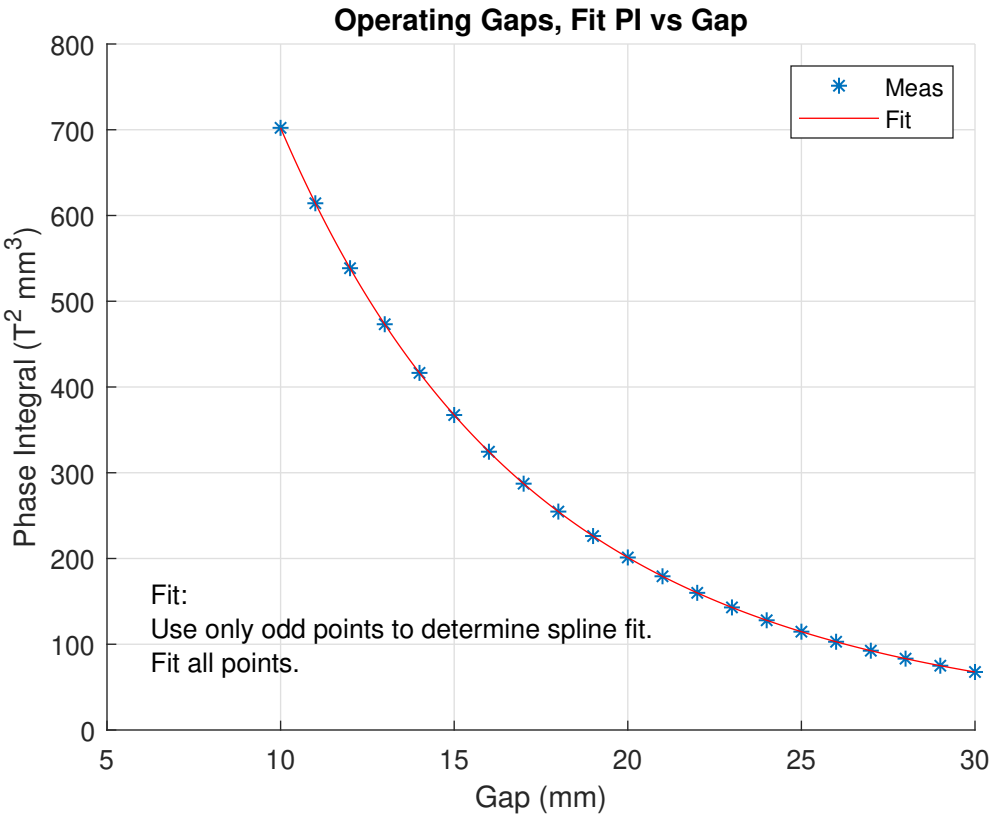
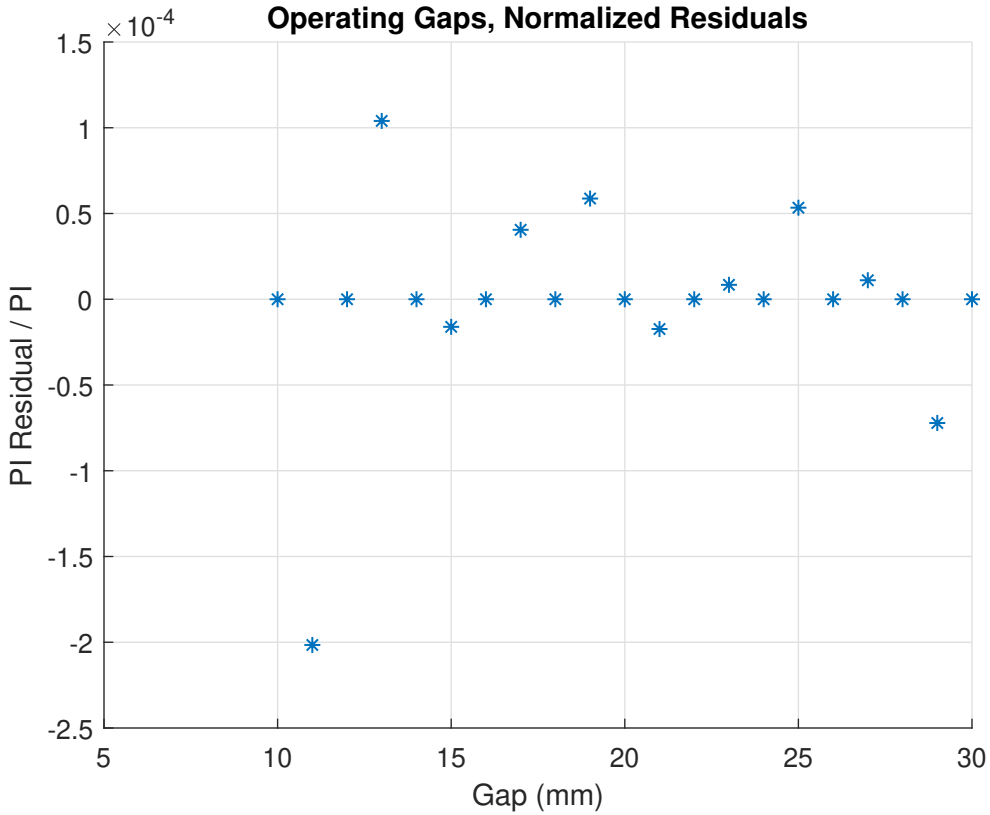
SLAC Magnetic Measurements#
Date: 05-22-2019#
Time: 11:00:05#

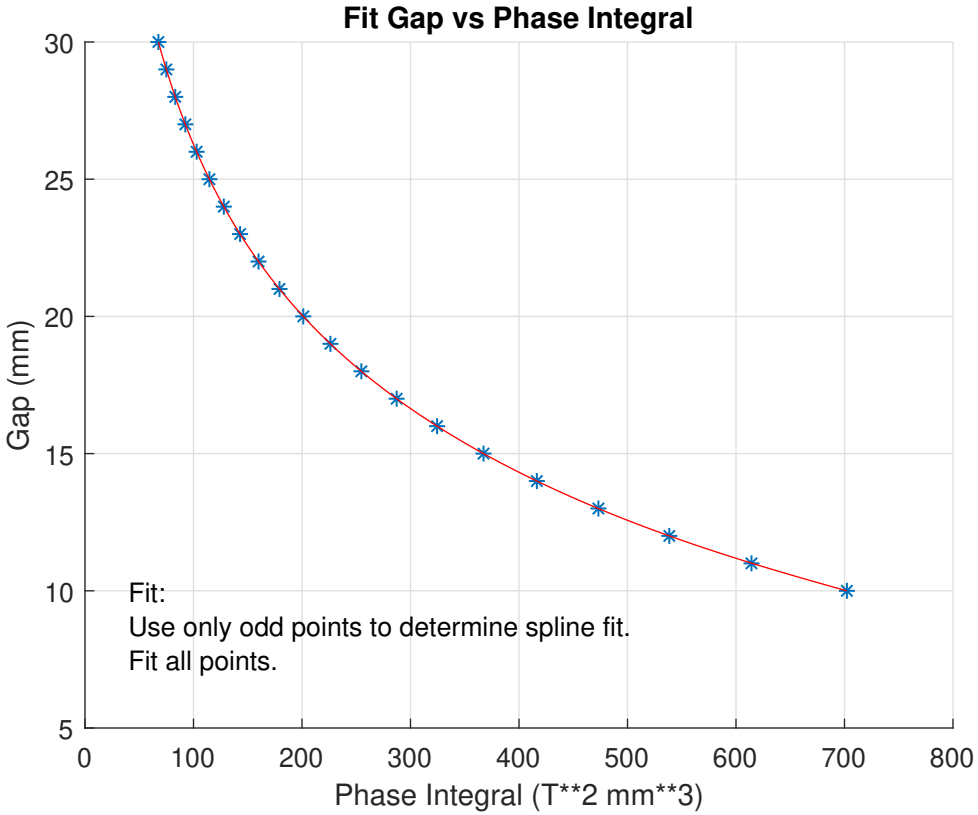

Gap vs Encoder Reading
Data
Fit
Fit:
Gap = p1 * enc + p2
p1 = -2.5000e-04 (mm / count)
p2 = 3.6345e+03 (mm)
Gap = p1 * (enc + p3)
p1 = -2.5000e-04 (mm / count)
p3 = -14537913
Gap (mm)
Encoder
×10^7
100
90
80
70
60
50
40
30
20
10
0
1.41
1.415
1.42
1.425
1.43
1.435
1.44
1.445
1.45

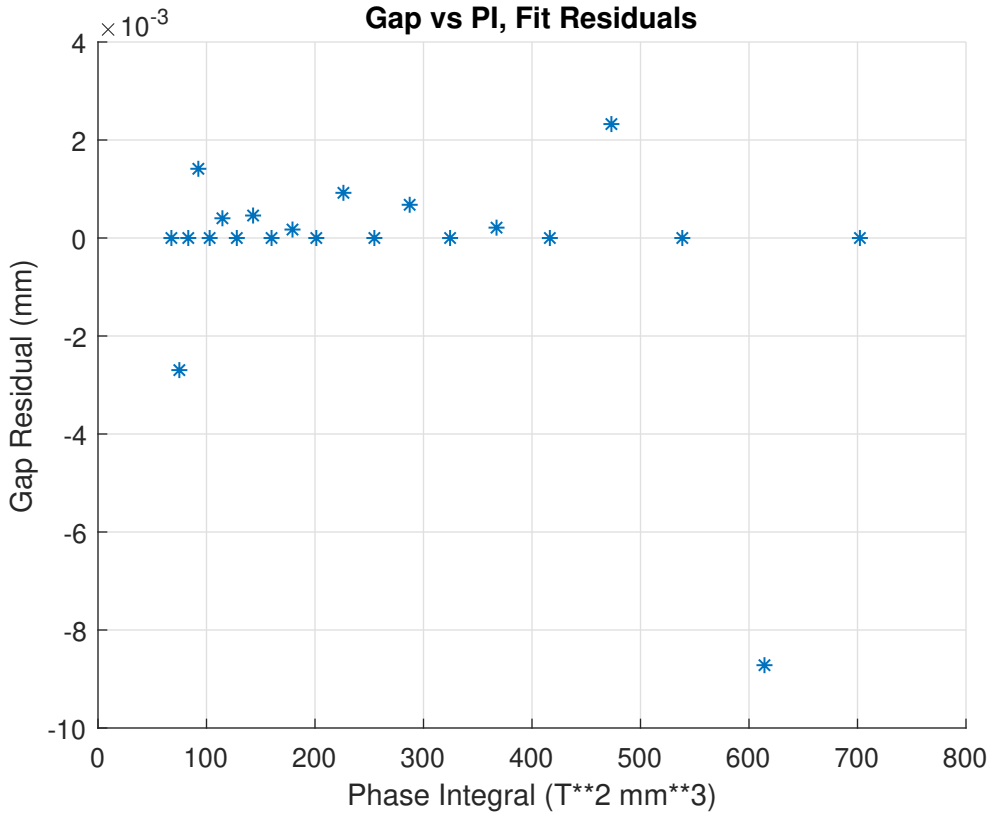

All Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T^2 mm^3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
0
100
200
300
400
500
600
700
800
0
10
20
30
40
50
60
70
80
90
100

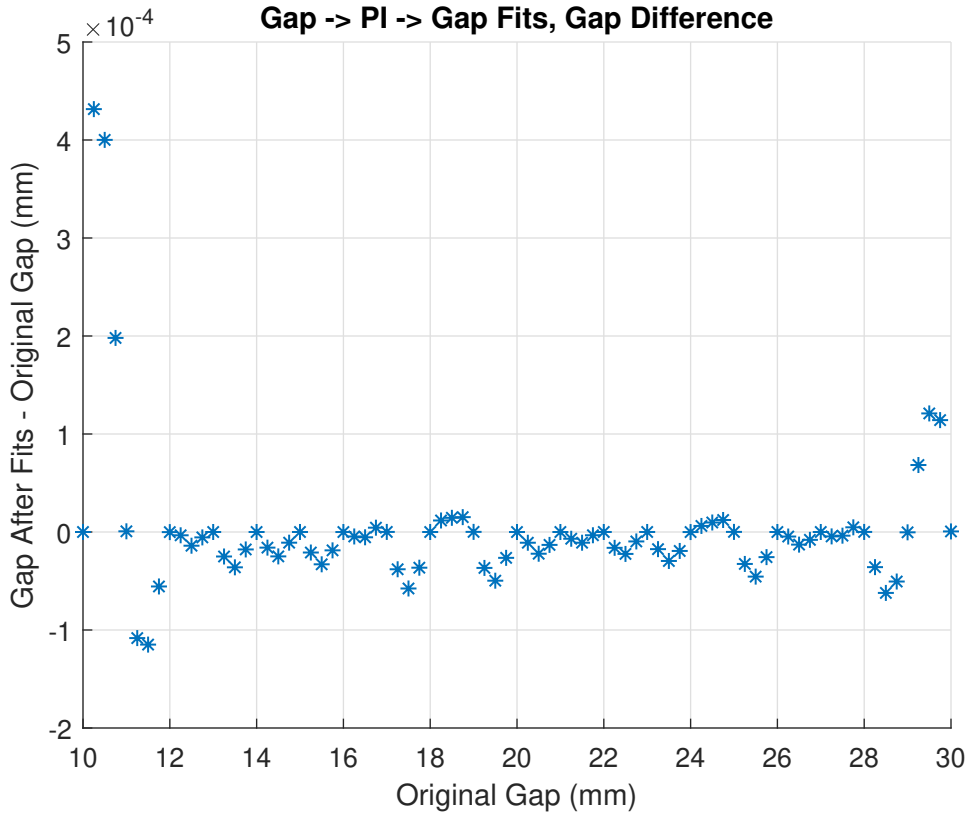

All Gaps, Normalized Residuals
PI Residual / PI
Gap (mm)
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
0
10
20
30
40
50
60
70
80
90
100

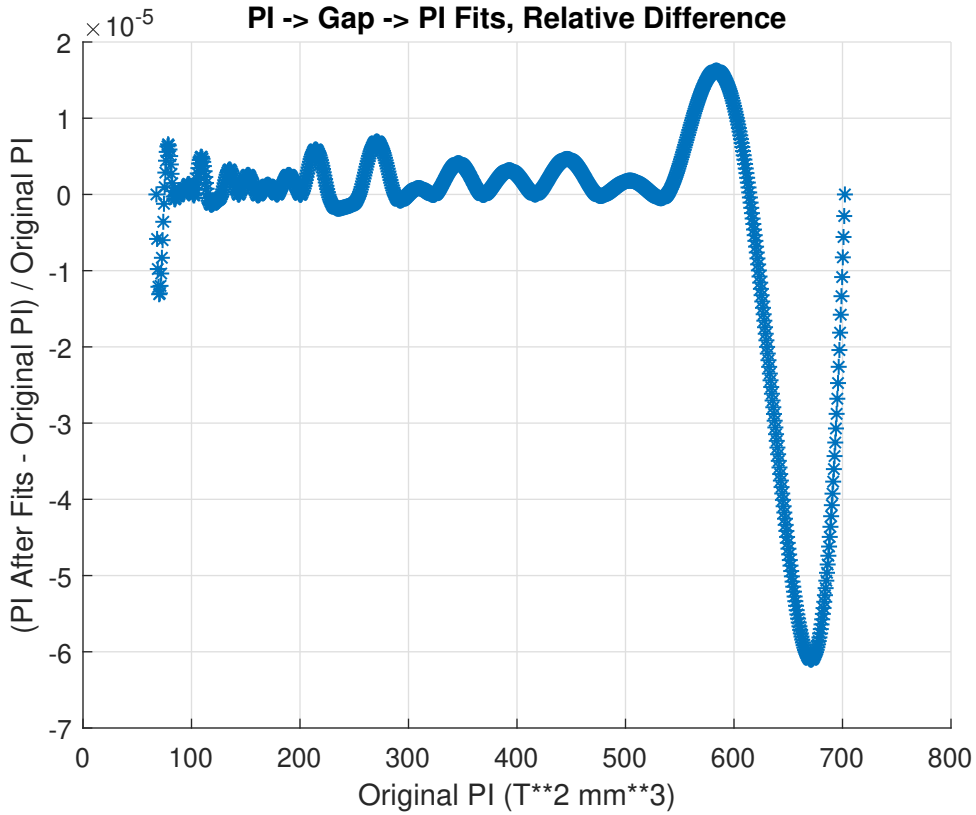

Operating Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T2 mm3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
0
100
200
300
400
500
600
700
800
5
10
15
20
25
30

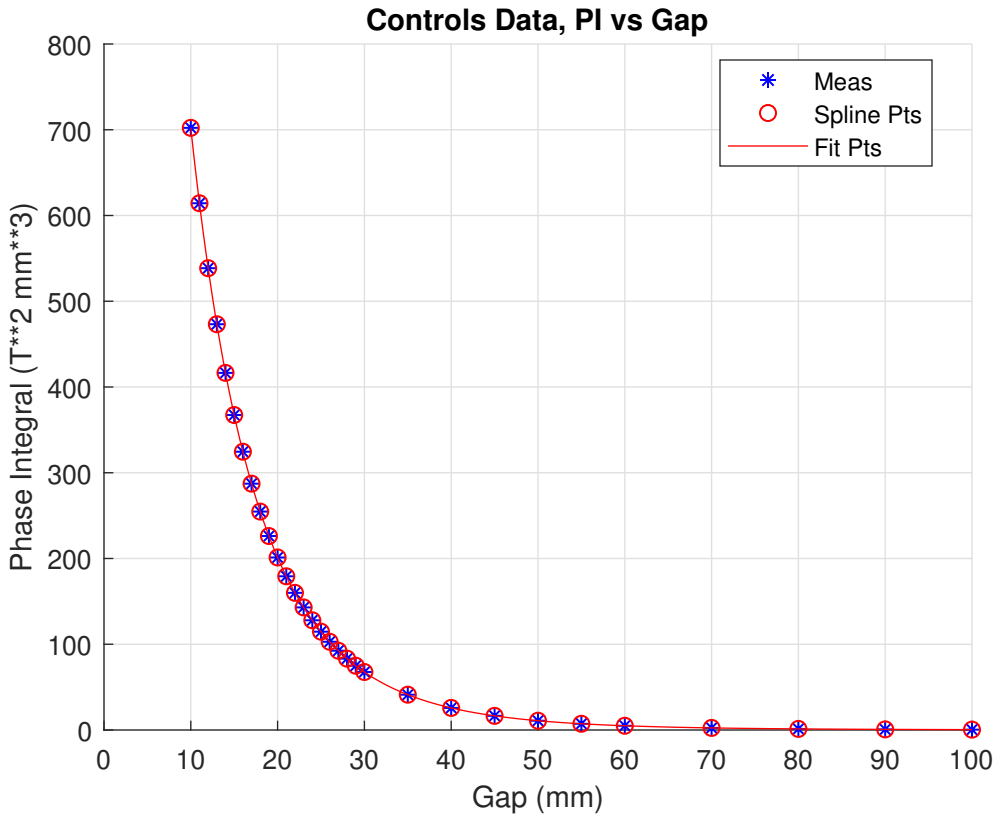

Operating Gaps, Normalized Residuals
×10^-4
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
PI Residual / PI
5
10
15
20
25
30
Gap (mm)

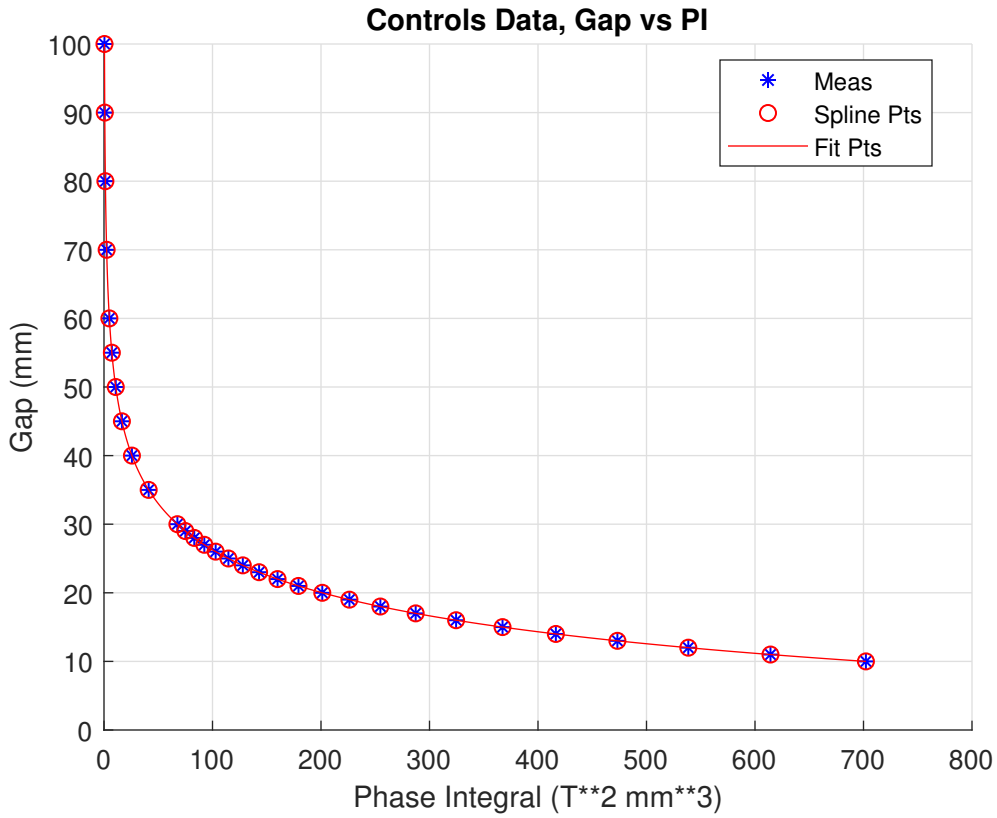

Fit Gap vs Phase Integral
Gap (mm)
Phase Integral (T**2 mm**3)
30
25
20
15
10
5
0
100
200
300
400
500
600
700
800
Fit:
Use only odd points to determine spline fit.
Fit all points.


Gap vs PI, Fit Residuals
×10-3
4
2
0
-2
-4
-6
-8
-10
Gap Residual (mm)
0
100
200
300
400
500
600
700
800
Phase Integral (T**2 mm**3)


Gap -> PI -> Gap Fits, Gap Difference
×10^-4
5
4
3
2
1
0
-1
-2
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
2
1
0
-1
-2
-3
-4
-5
-6
-7
(PI After Fits - Original PI) / Original PI
0
100
200
300
400
500
600
700
800
Original PI (T**2 mm**3)


Controls Data, PI vs Gap
Meas
Spline Pts
Fit Pts
Phase Integral (T**2 mm**3)
Gap (mm)
0
100
200
300
400
500
600
700
800
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)
0
10
20
30
40
50
60
70
80
90
100
0
100
200
300
400
500
600
700
800