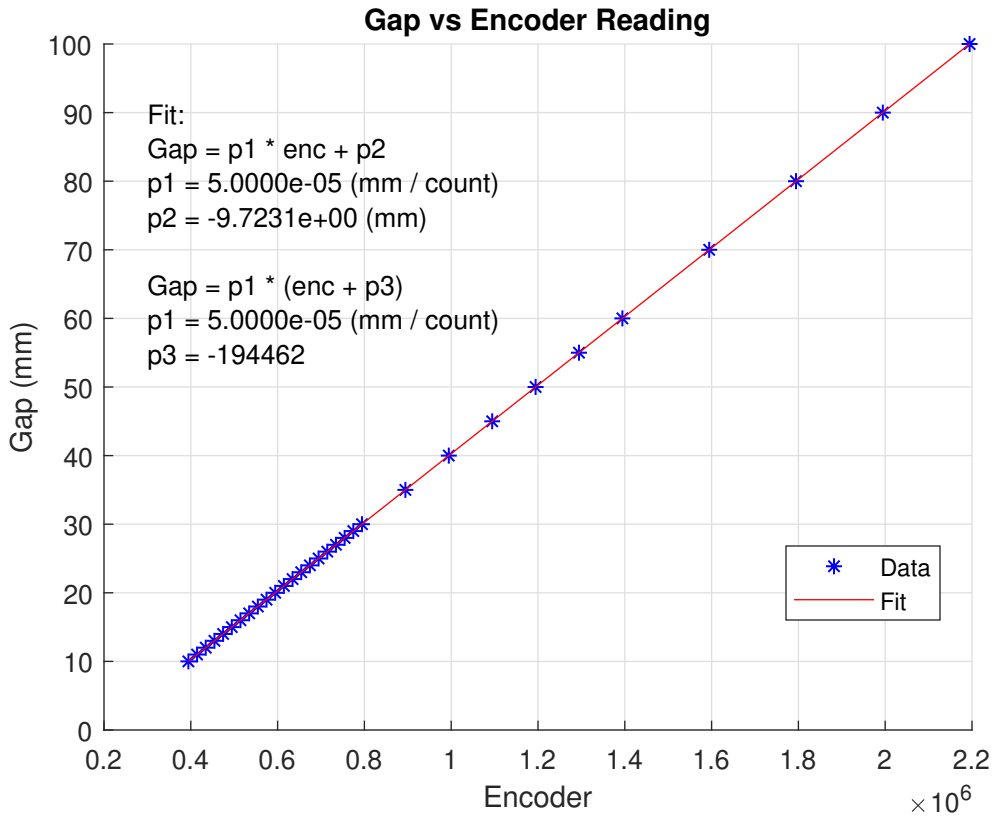
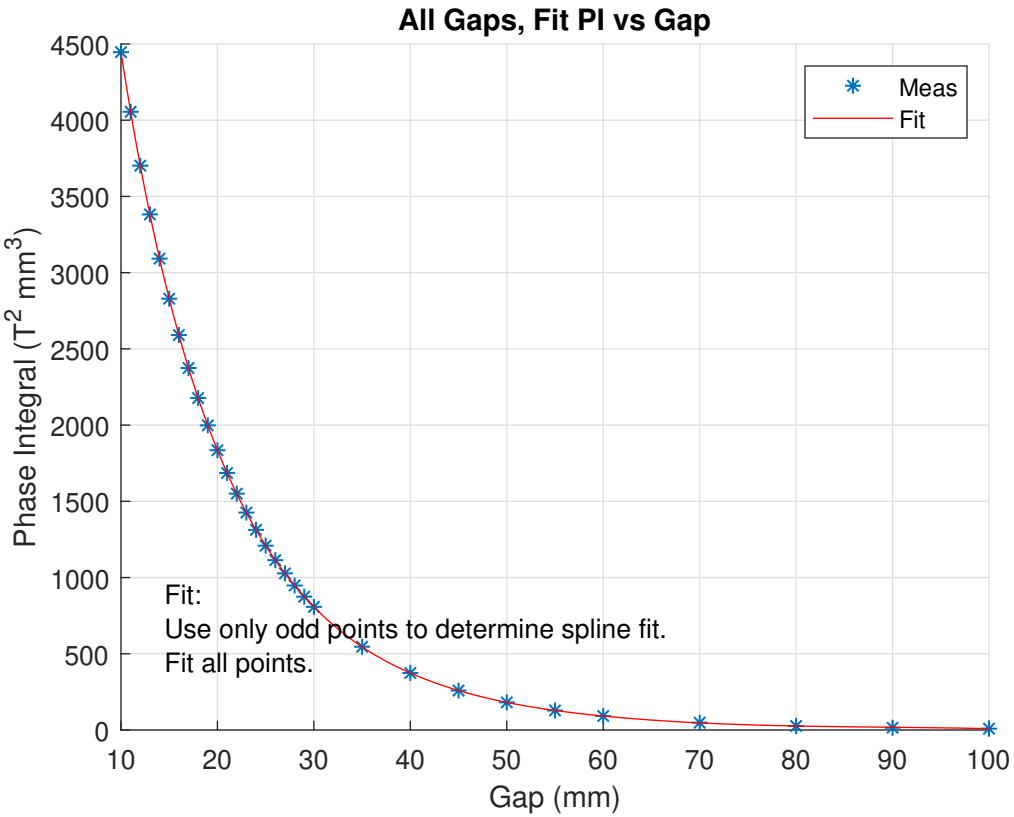
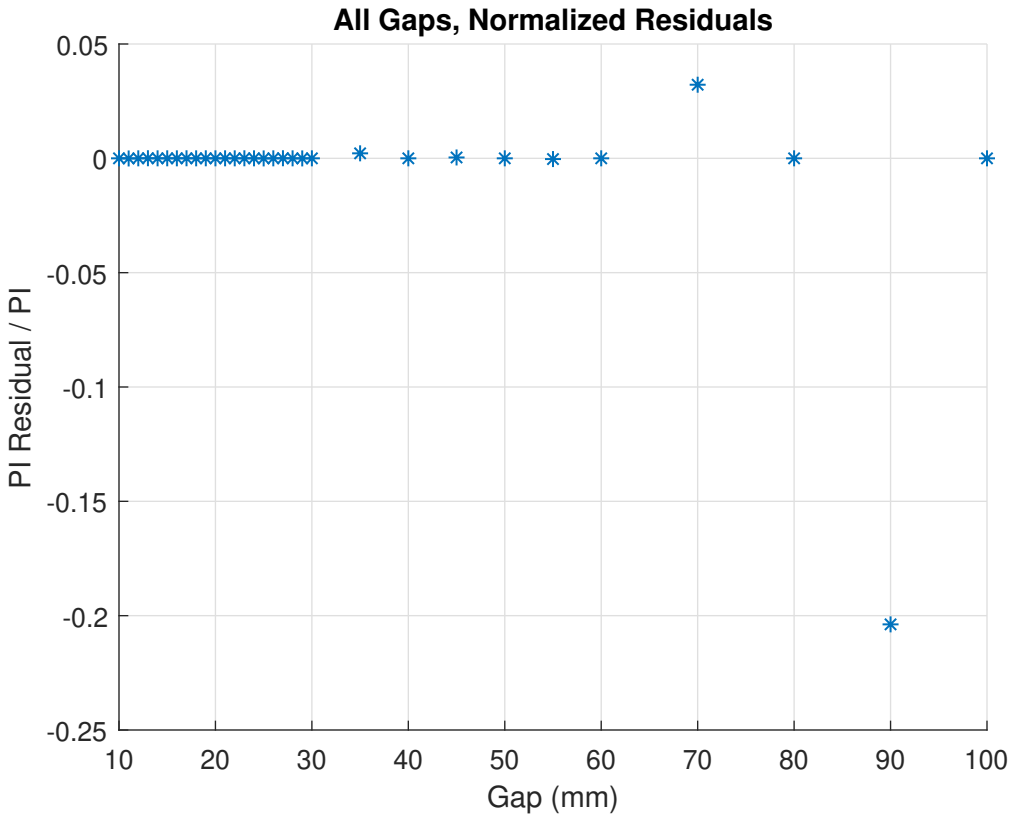
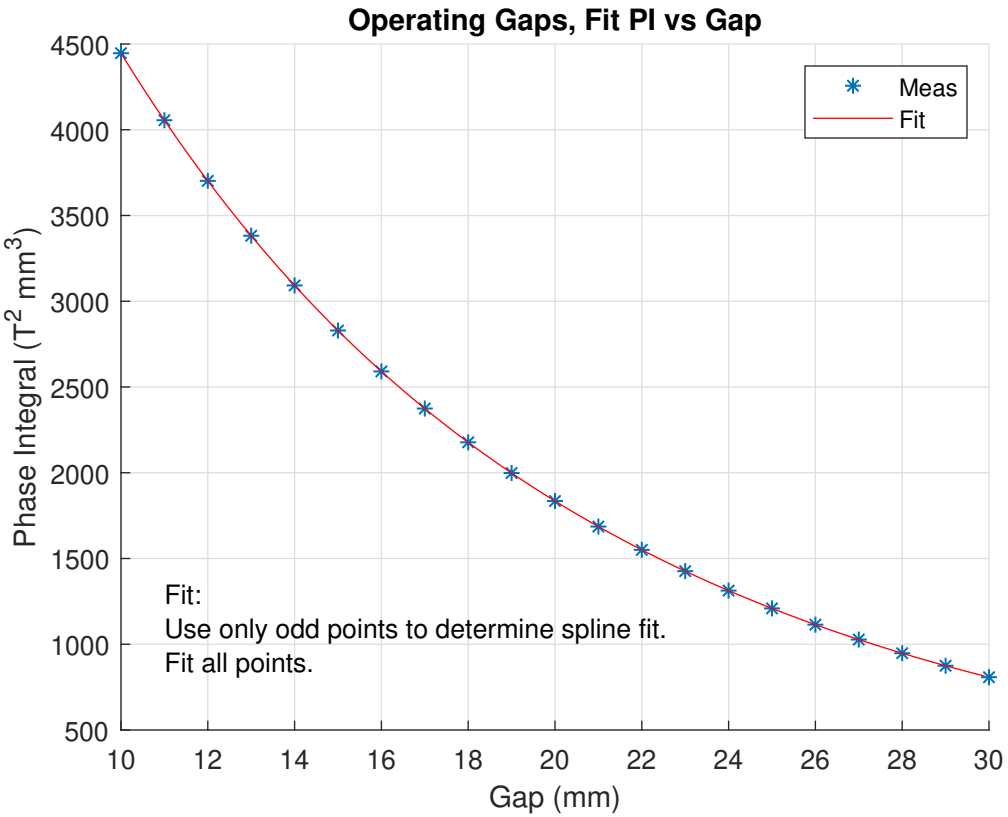
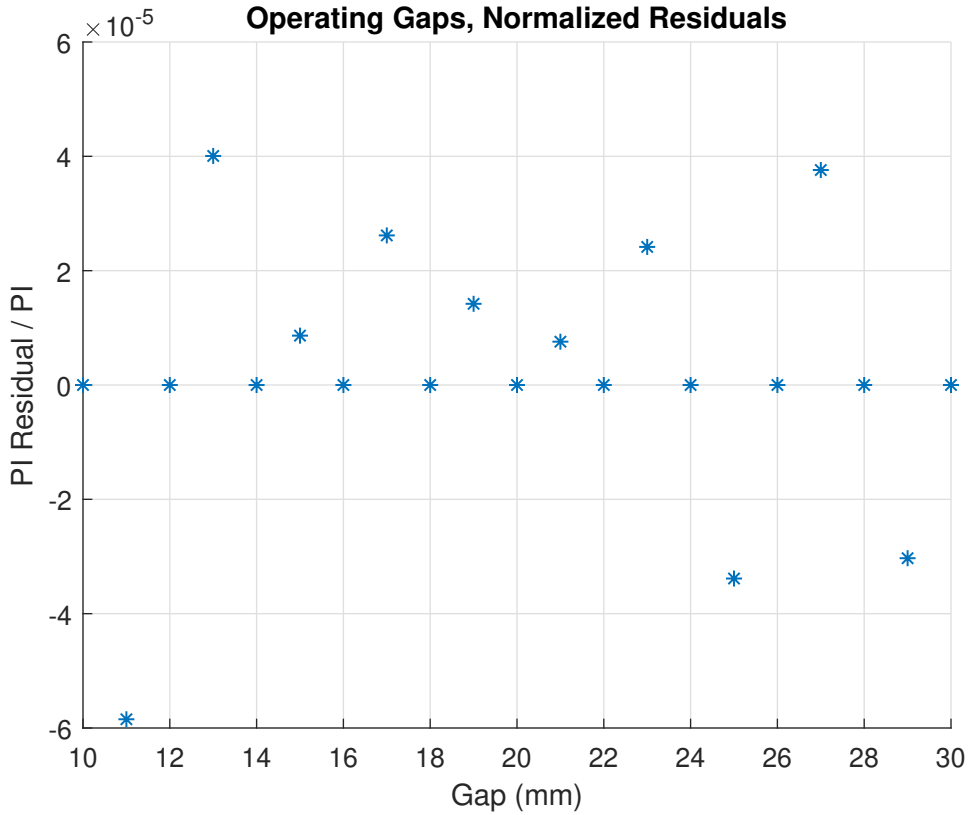
SLAC Magnetic Measurements#
Date: 06-28-2019#
Time: 08:30:28#

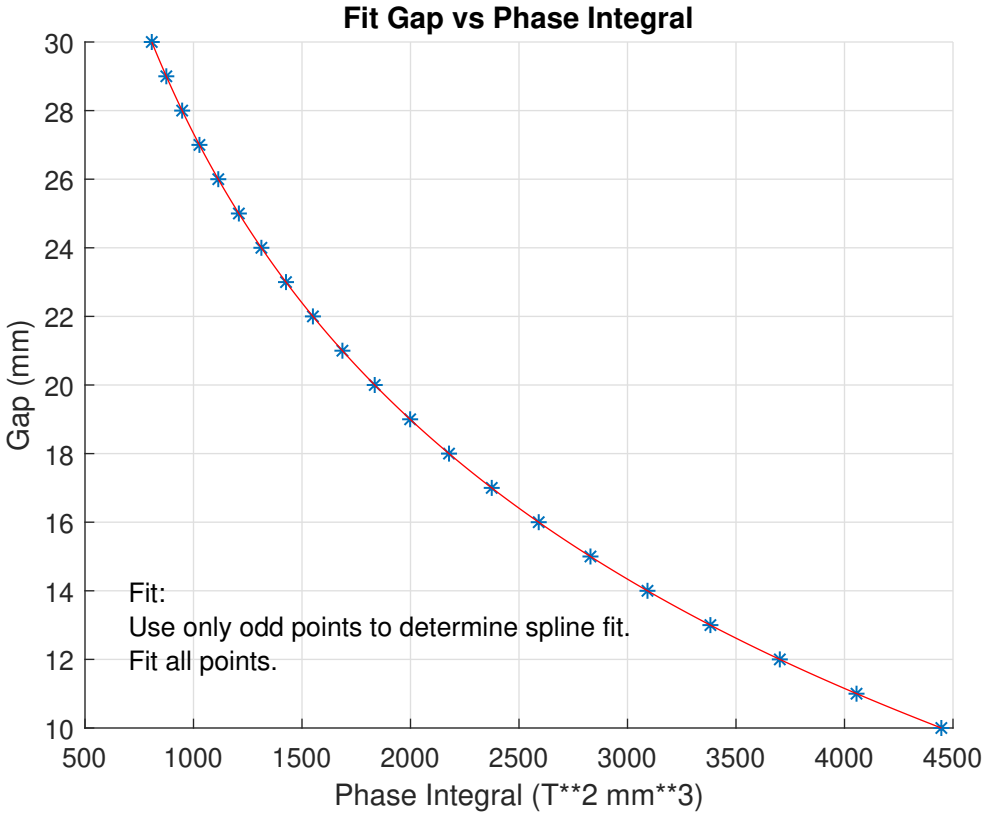

Gap vs Encoder Reading
Fit:
Gap = p1 * enc + p2
p1 = 5.0000e-05 (mm / count)
p2 = -9.7231e+00 (mm)
Gap = p1 * (enc + p3)
p1 = 5.0000e-05 (mm / count)
p3 = -194462
Data
Fit
Gap (mm)
Encoder
×10^6
0
10
20
30
40
50
60
70
80
90
100
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2

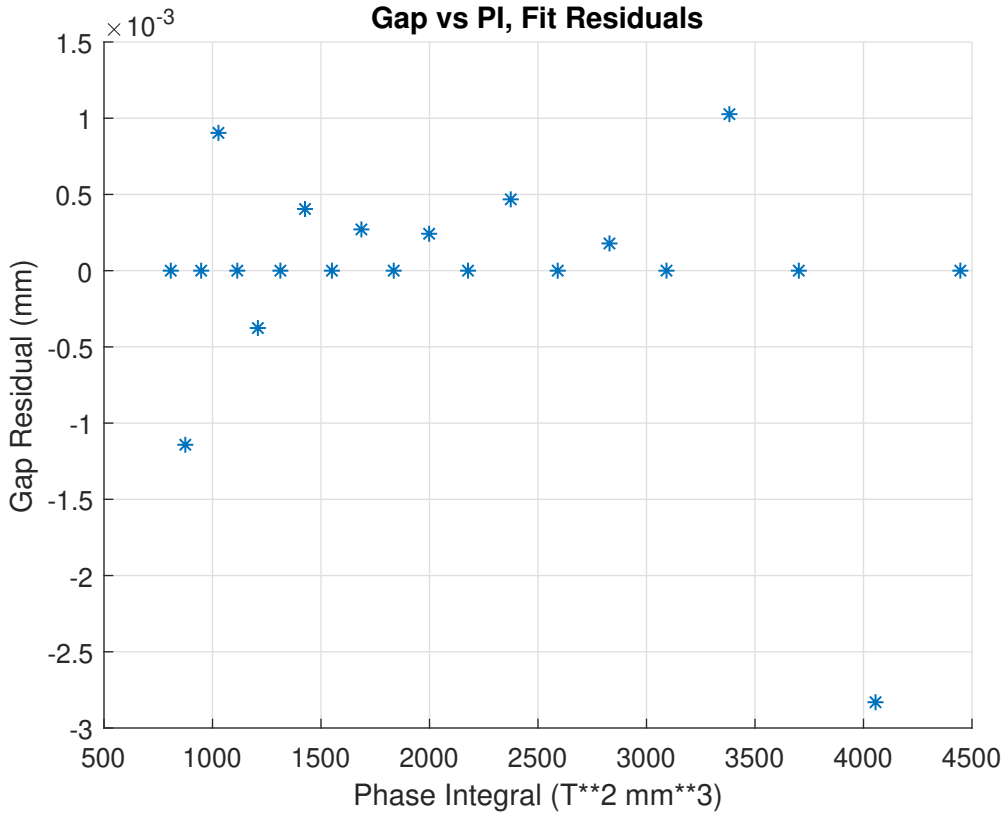

All Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T^2 mm^3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
4500
4000
3500
3000
2500
2000
1500
1000
500
0
10
20
30
40
50
60
70
80
90
100

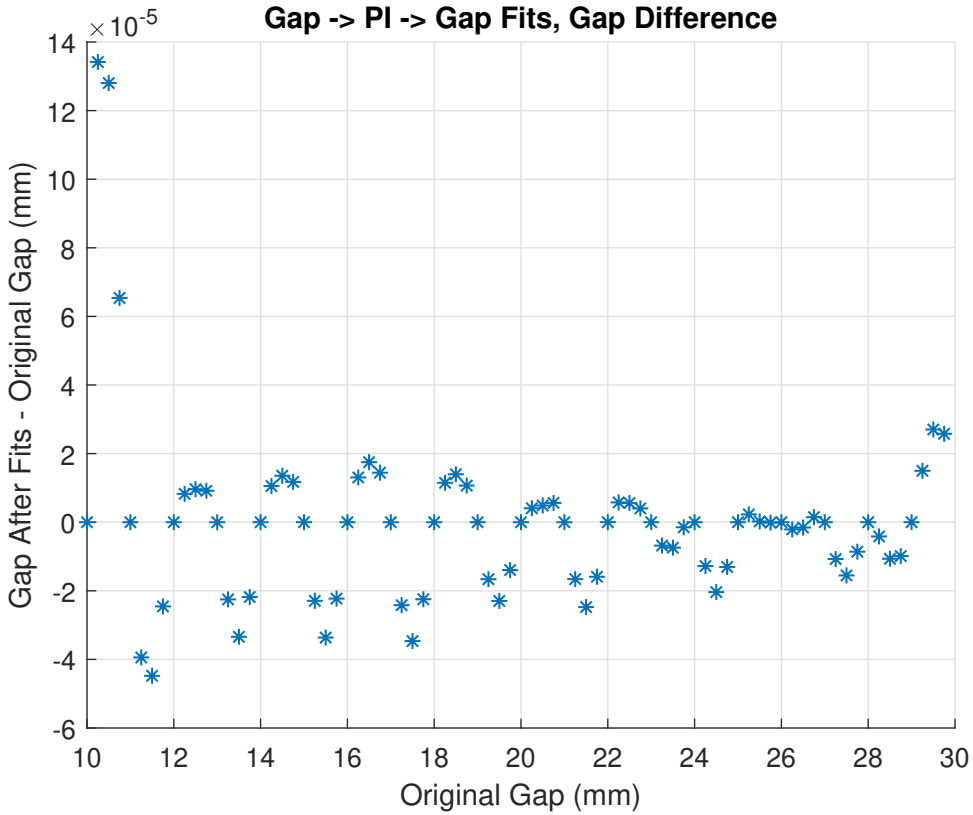

All Gaps, Normalized Residuals
PI Residual / PI
Gap (mm)
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
10
20
30
40
50
60
70
80
90
100

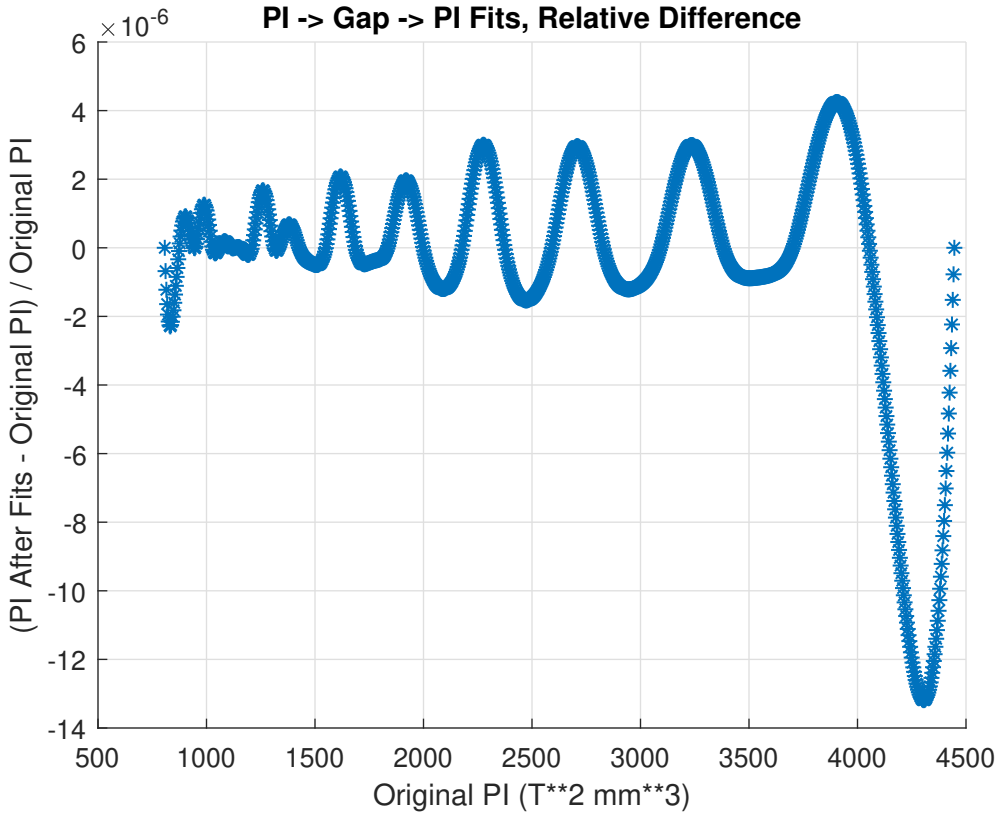

Operating Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T^2 mm^3)
Gap (mm)
4500
4000
3500
3000
2500
2000
1500
1000
500
10
12
14
16
18
20
22
24
26
28
30
Fit:
Use only odd points to determine spline fit.
Fit all points.

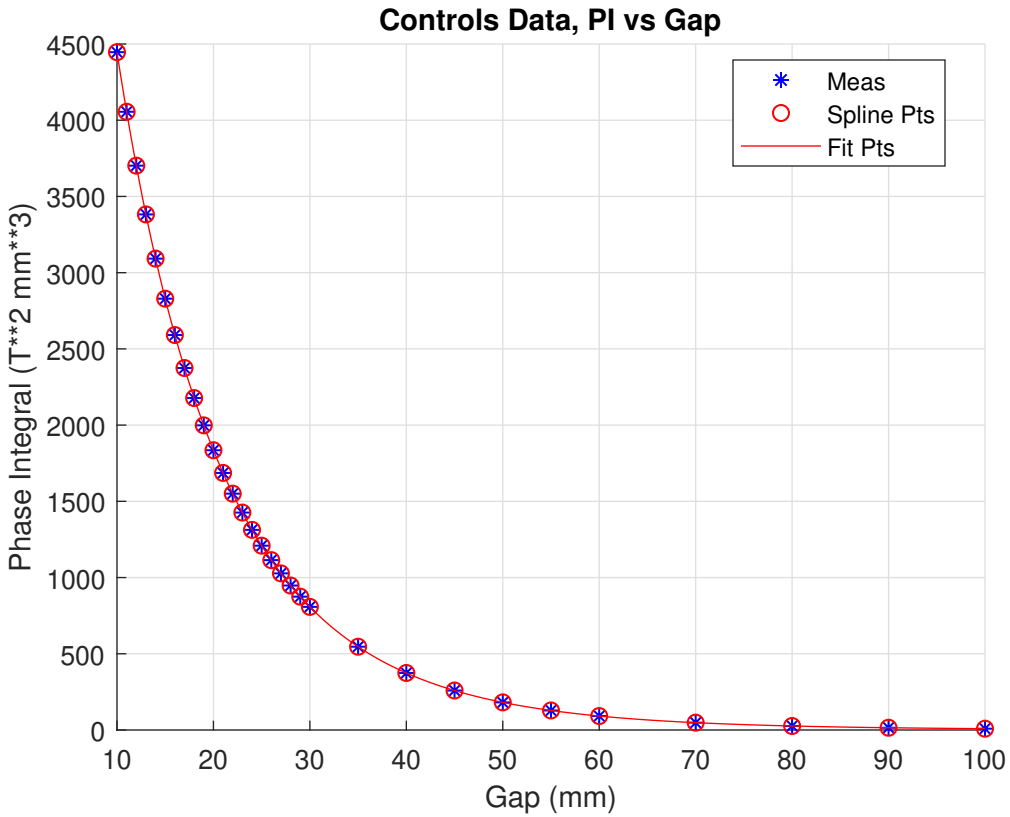

Operating Gaps, Normalized Residuals
×10-5
6
4
2
0
-2
-4
-6
PI Residual / PI
10
12
14
16
18
20
22
24
26
28
30
Gap (mm)

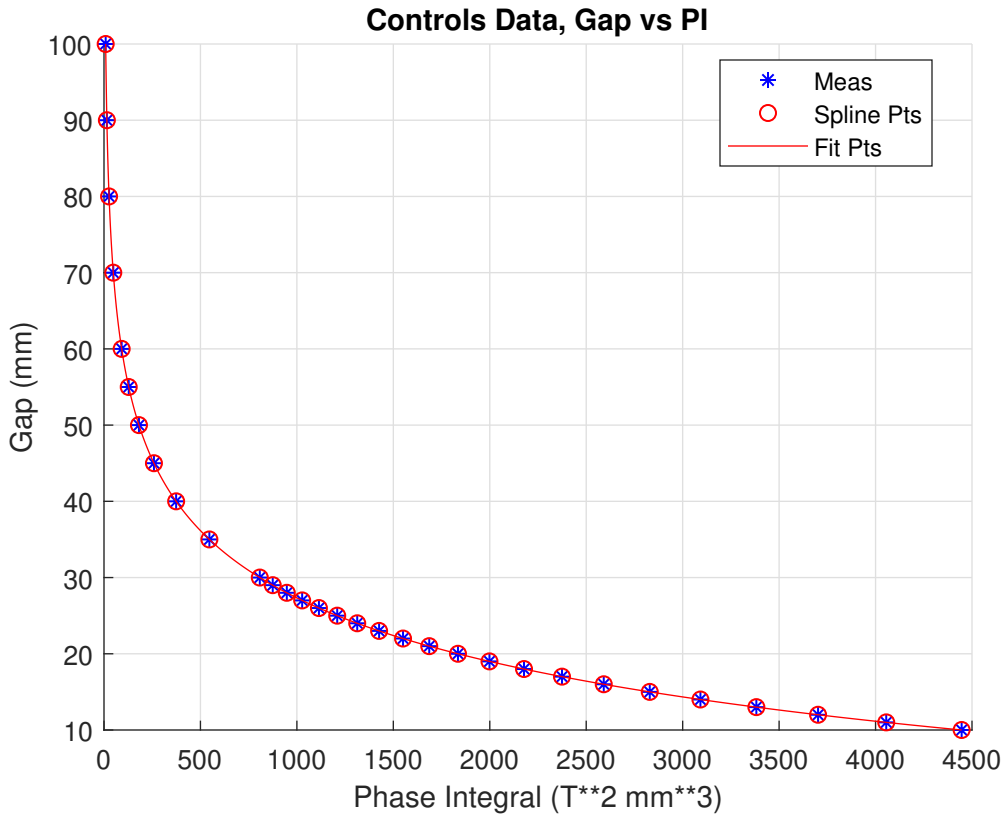

Fit Gap vs Phase Integral
Gap (mm)
Phase Integral (T**2 mm**3)
30
28
26
24
22
20
18
16
14
12
10
500
1000
1500
2000
2500
3000
3500
4000
4500
Fit:
Use only odd points to determine spline fit.
Fit all points.


Gap vs PI, Fit Residuals
×10-3
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Gap Residual (mm)
500
1000
1500
2000
2500
3000
3500
4000
4500
Phase Integral (T**2 mm**3)


Gap -> PI -> Gap Fits, Gap Difference
×10^-5
14
12
10
8
6
4
2
0
-2
-4
-6
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^-6
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
(PI After Fits - Original PI) / Original PI
500
1000
1500
2000
2500
3000
3500
4000
4500
Original PI (T**2 mm**3)


Controls Data, PI vs Gap
Meas
Spline Pts
Fit Pts
Phase Integral (T**2 mm**3)
Gap (mm)
4500
4000
3500
3000
2500
2000
1500
1000
500
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
500
1000
1500
2000
2500
3000
3500
4000
4500