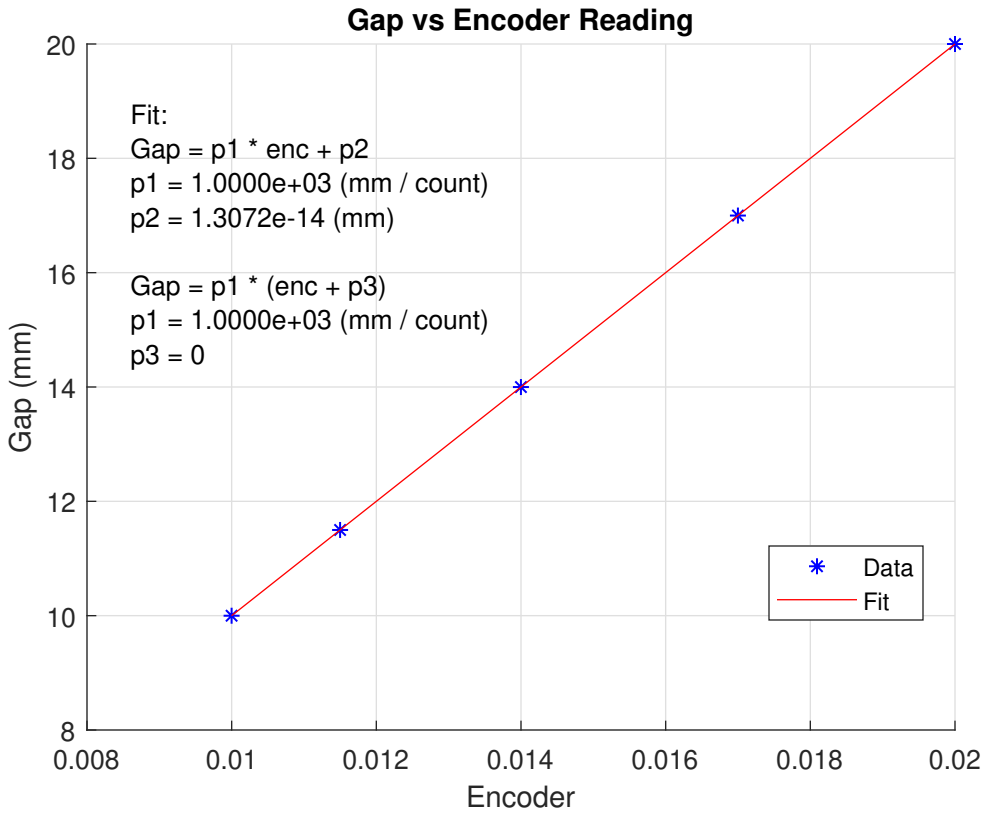
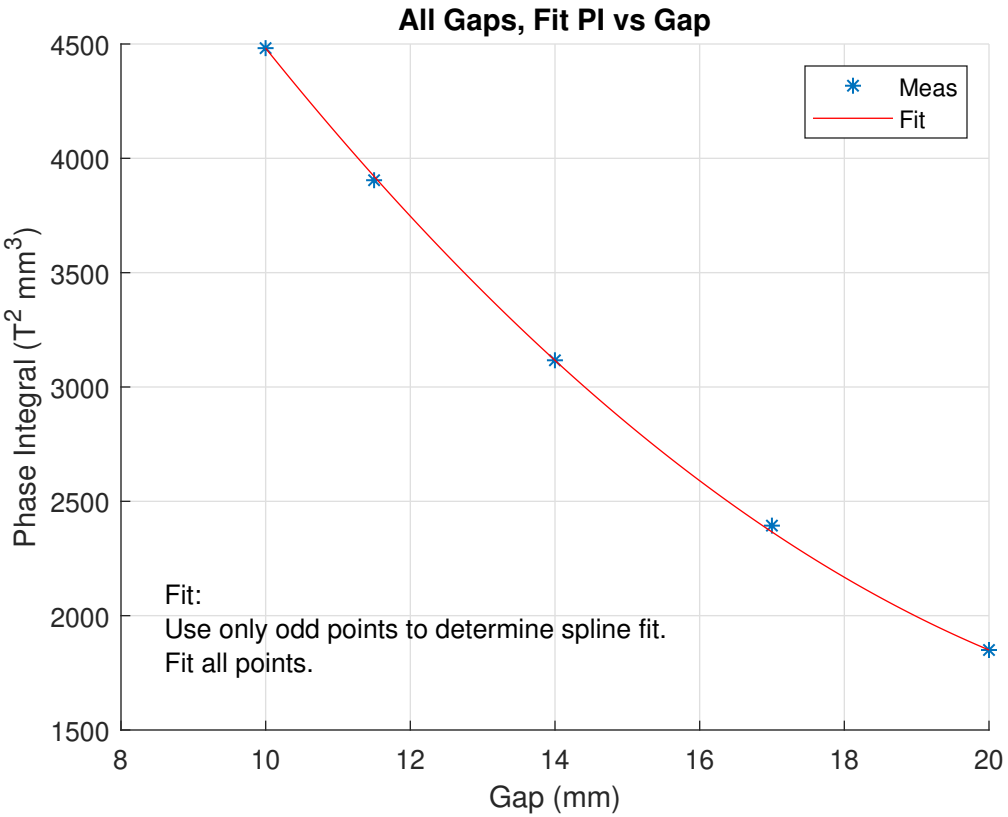
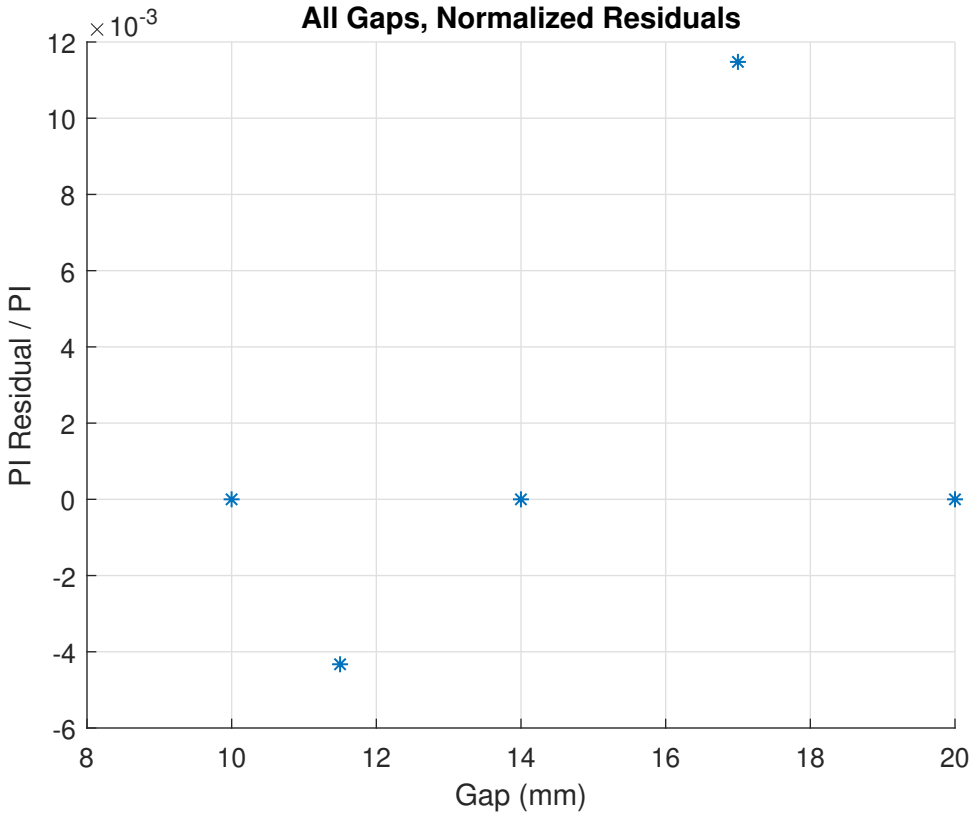
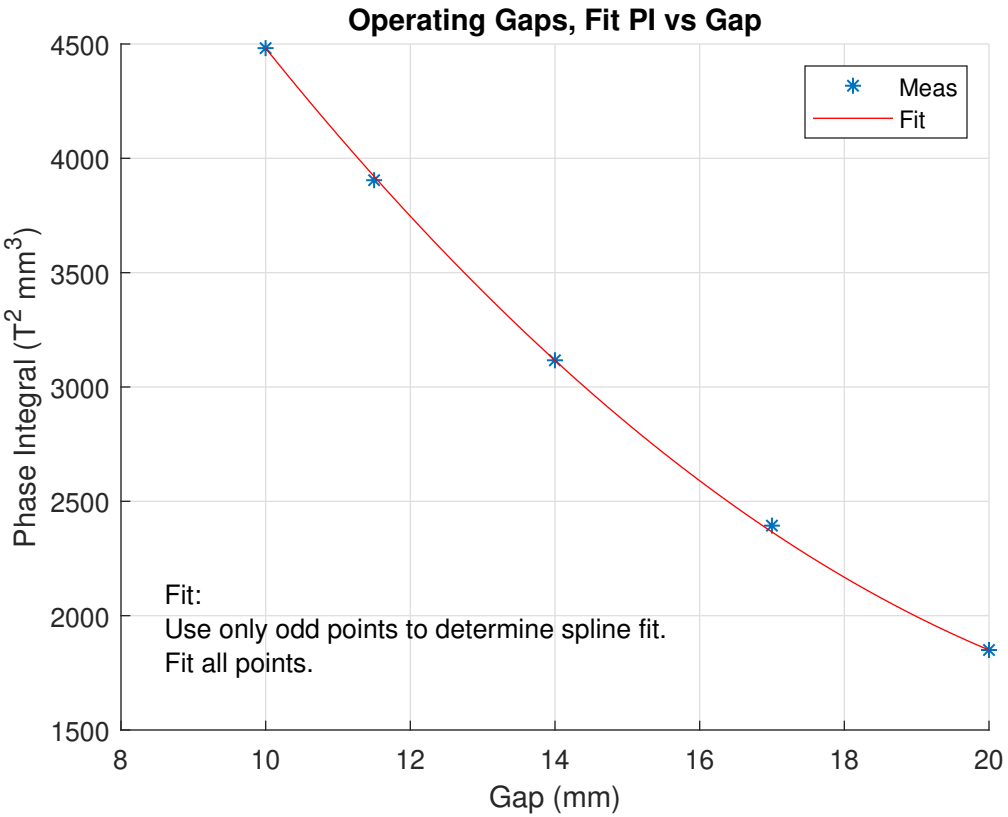
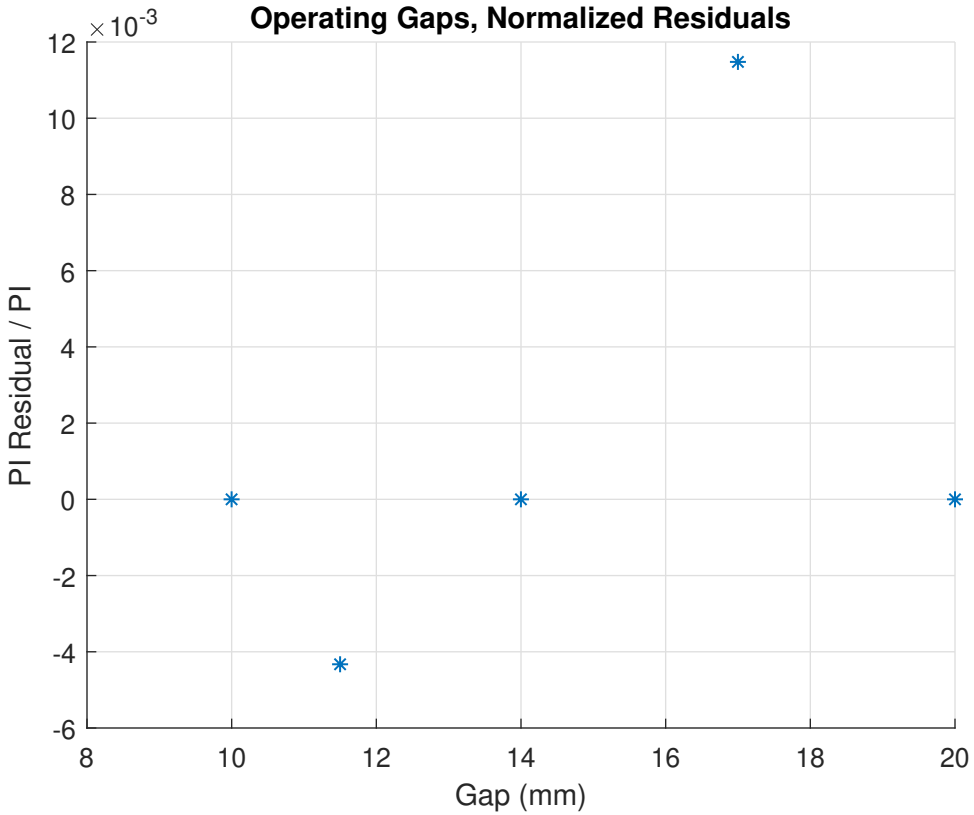
SLAC Magnetic Measurements#
Date: 10-02-2018#
Time: 15:05:40#

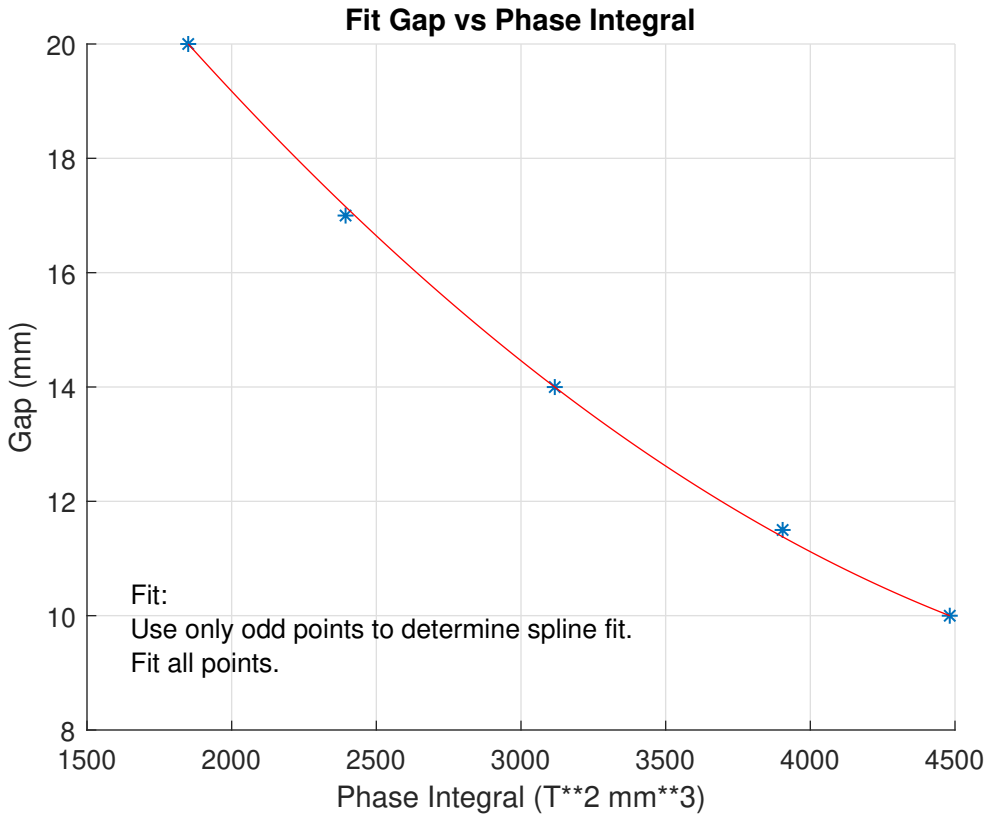

Gap vs Encoder Reading
Fit:
Gap = p1 * enc + p2
p1 = 1.0000e+03 (mm / count)
p2 = 1.3072e-14 (mm)
Gap = p1 * (enc + p3)
p1 = 1.0000e+03 (mm / count)
p3 = 0
Data
Fit
Gap (mm)
Encoder
20
18
16
14
12
10
8
0.008
0.01
0.012
0.014
0.016
0.018
0.02

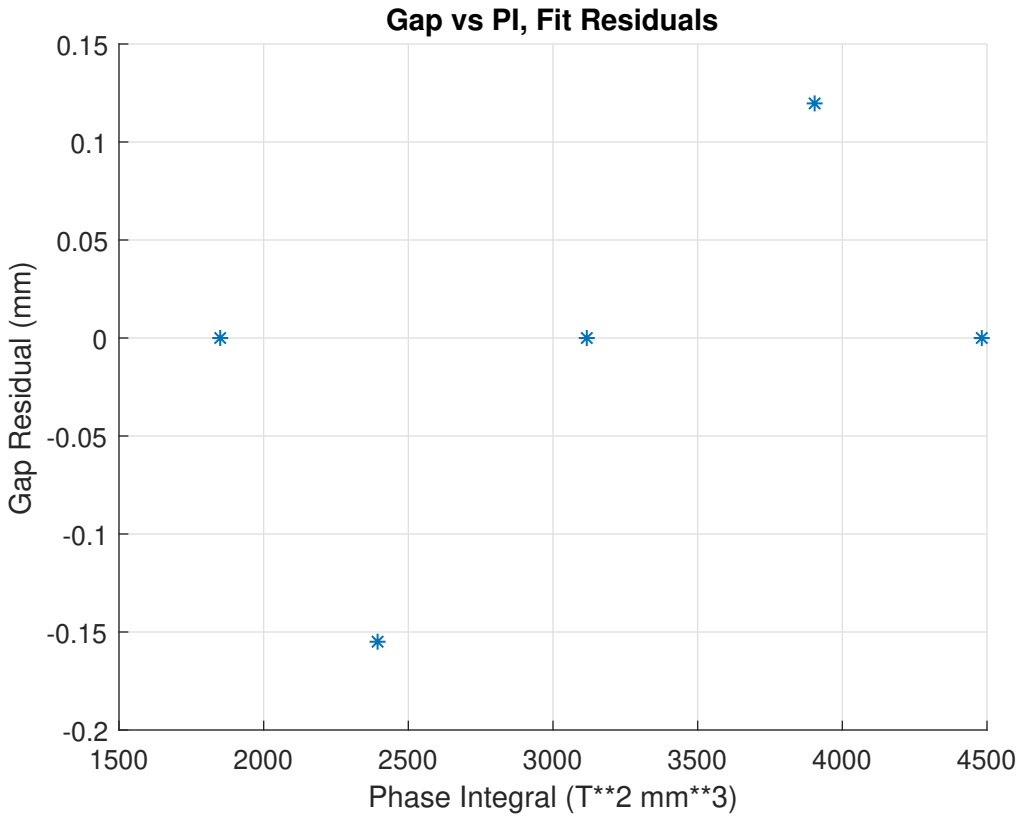

All Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T^2 mm^3)
Gap (mm)
4500
4000
3500
3000
2500
2000
1500
8
10
12
14
16
18
20
Fit:
Use only odd points to determine spline fit.
Fit all points.

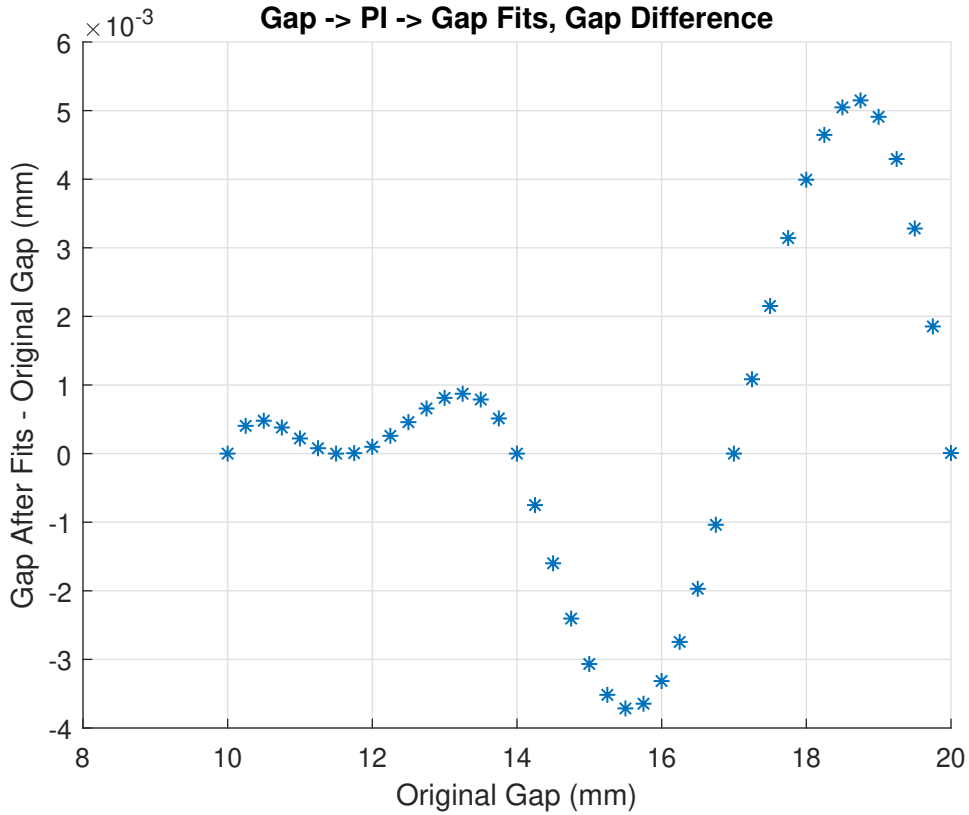

All Gaps, Normalized Residuals
×10-3
12
10
8
6
4
2
0
-2
-4
-6
PI Residual / PI
8
10
12
14
16
18
20
Gap (mm)

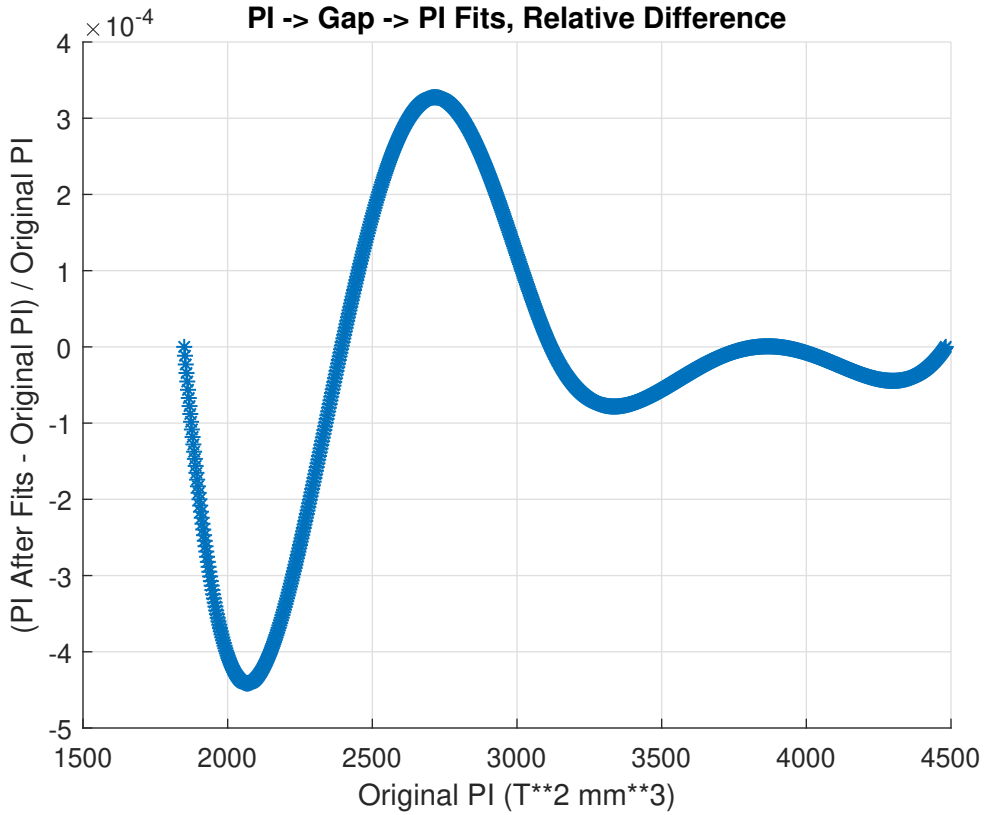

Operating Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T^2 mm^3)
Gap (mm)
4500
4000
3500
3000
2500
2000
1500
8
10
12
14
16
18
20
Fit:
Use only odd points to determine spline fit.
Fit all points.

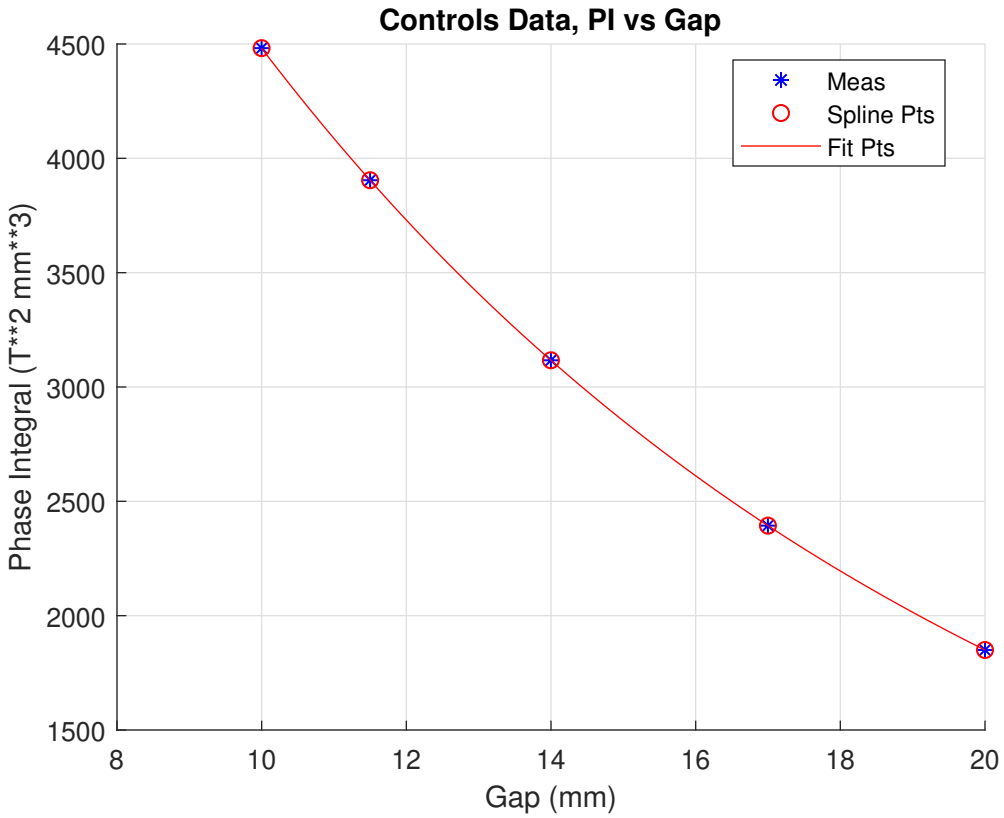

Operating Gaps, Normalized Residuals
×10-3
12
10
8
6
4
2
0
-2
-4
-6
PI Residual / PI
8
10
12
14
16
18
20
Gap (mm)

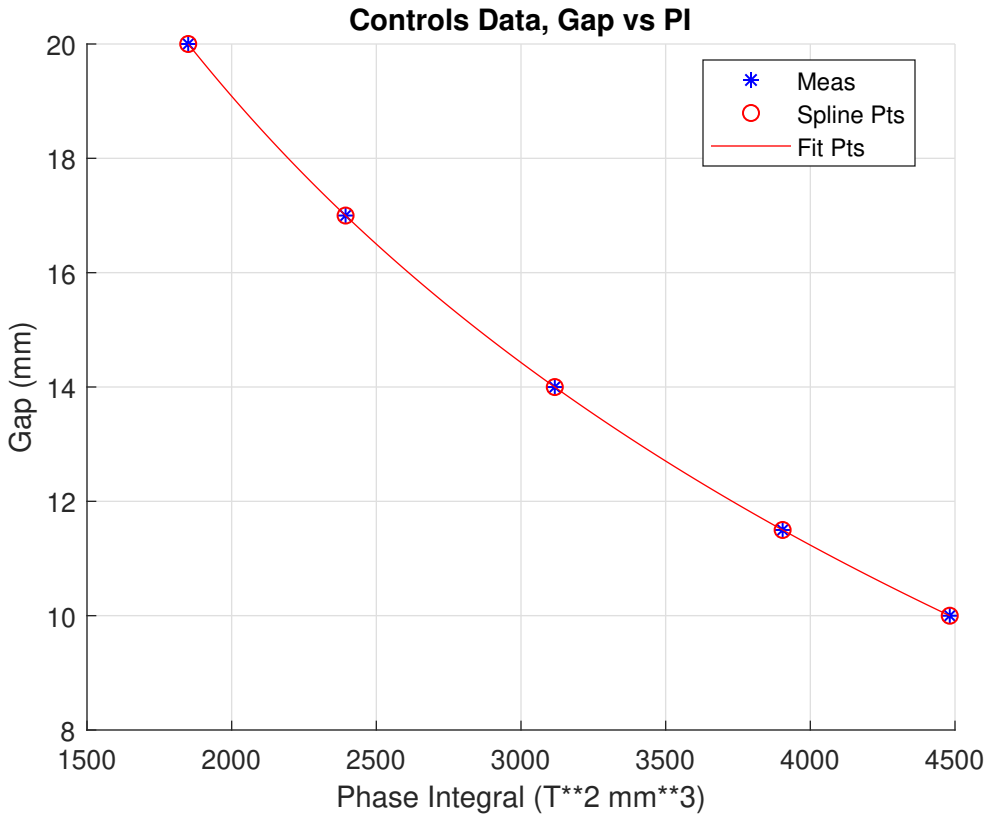

Fit Gap vs Phase Integral
Gap (mm)
Phase Integral (T**2 mm**3)
20
18
16
14
12
10
8
1500
2000
2500
3000
3500
4000
4500
Fit:
Use only odd points to determine spline fit.
Fit all points.


Gap vs PI, Fit Residuals
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
Gap Residual (mm)
1500
2000
2500
3000
3500
4000
4500
Phase Integral (T**2 mm**3)


Gap -> PI -> Gap Fits, Gap Difference
×10-3
6
5
4
3
2
1
0
-1
-2
-3
-4
Gap After Fits - Original Gap (mm)
8
10
12
14
16
18
20
Original Gap (mm)


PI -> Gap -> PI Fits, Relative Difference
×10^-4
4
3
2
1
0
-1
-2
-3
-4
-5
(PI After Fits - Original PI) / Original PI
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
8
10
12
14
16
18
20


Controls Data, Gap vs PI
Meas
Spline Pts
Fit Pts
Gap (mm)
20
18
16
14
12
10
8
1500
2000
2500
3000
3500
4000
4500
Phase Integral (T**2 mm**3)