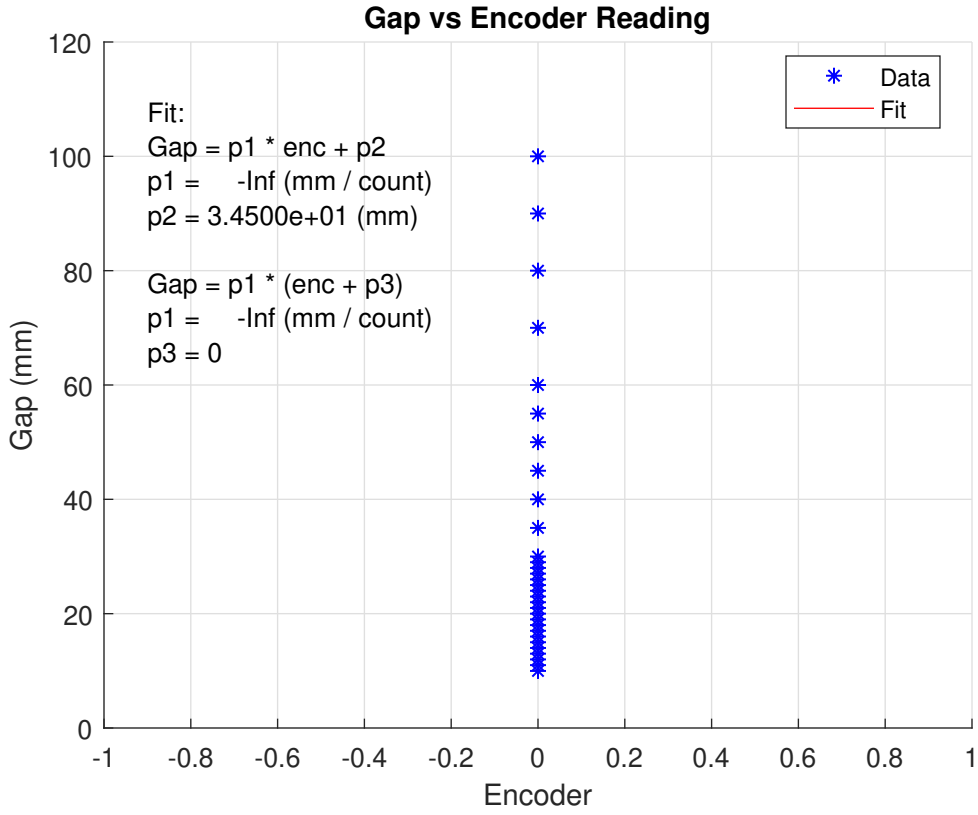
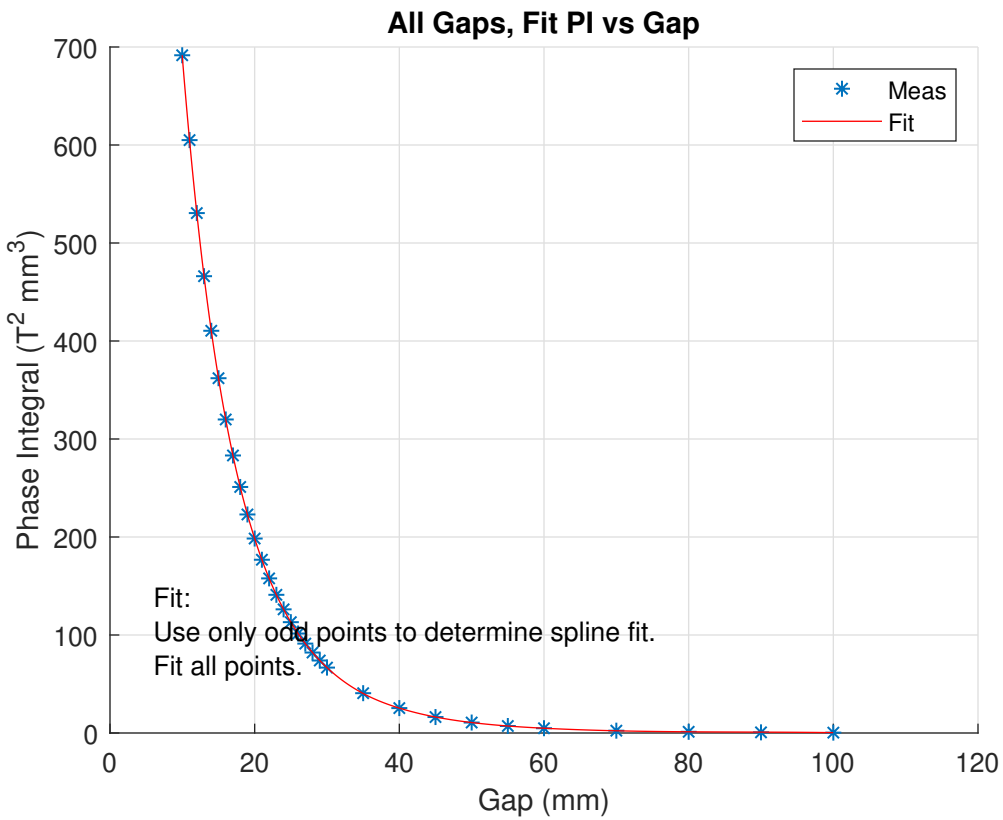
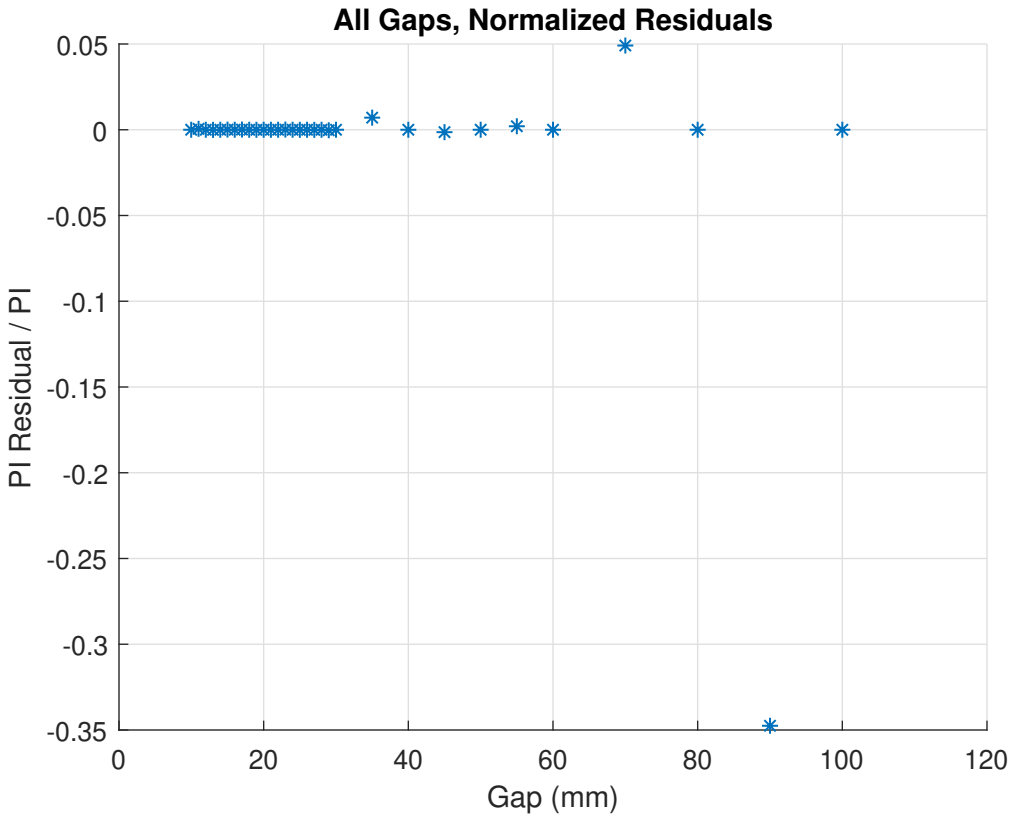
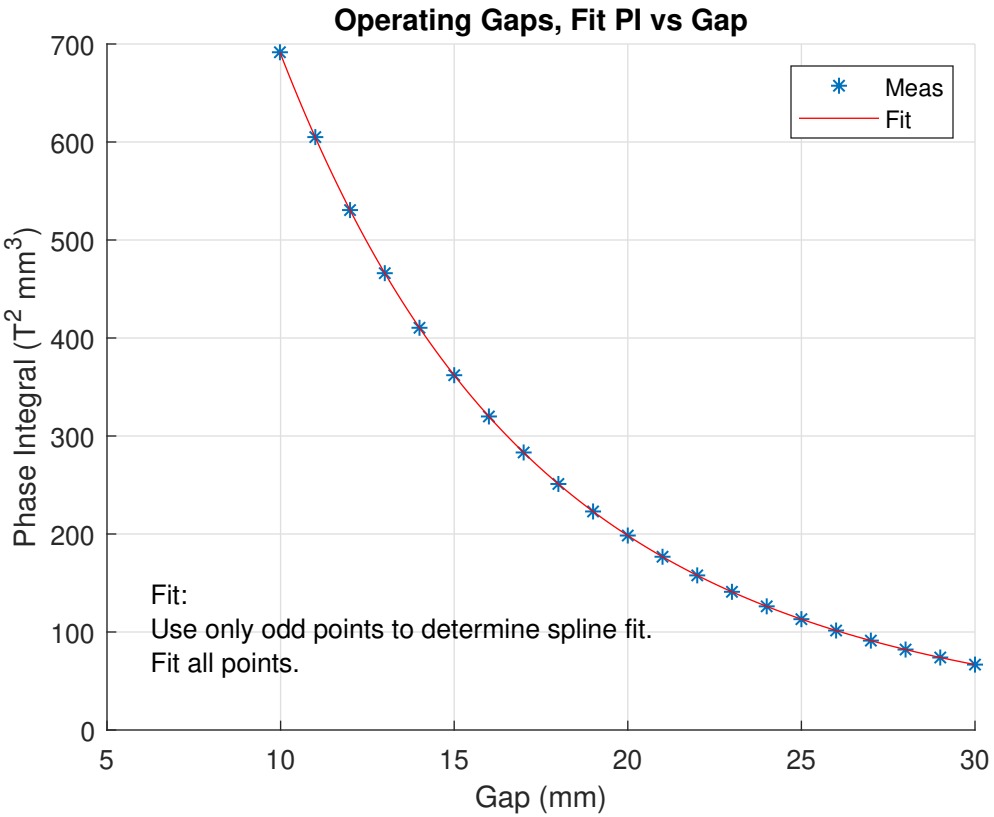
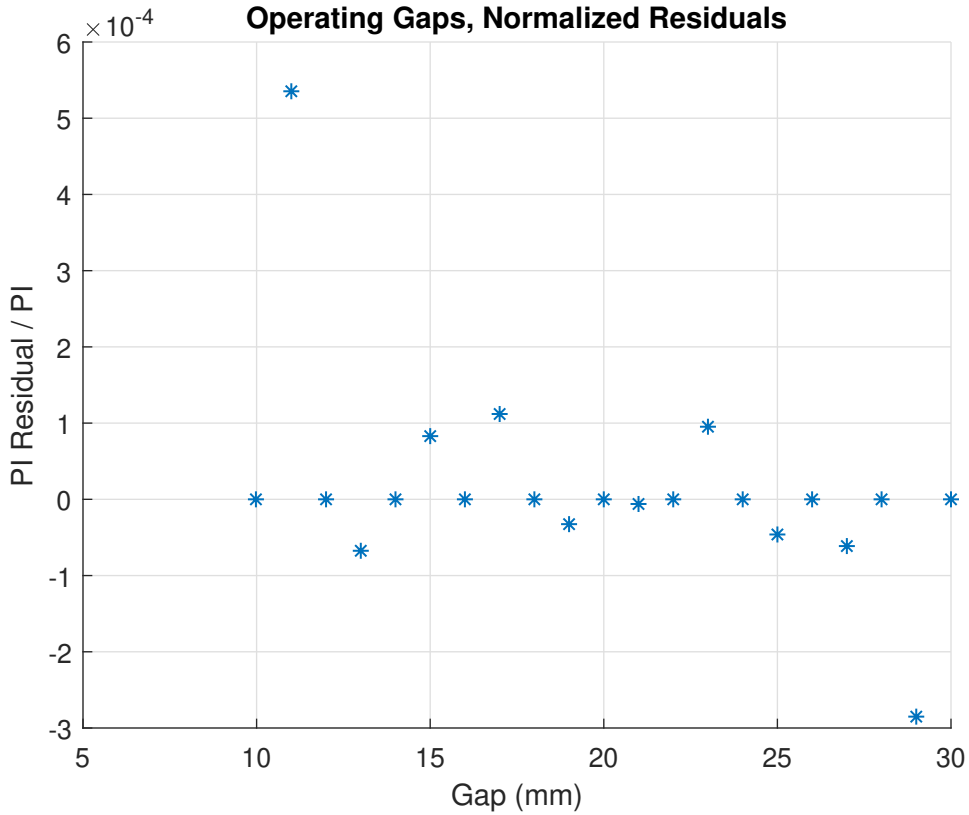
SLAC Magnetic Measurements#
Date: 01-30-2019#
Time: 18:20:23#

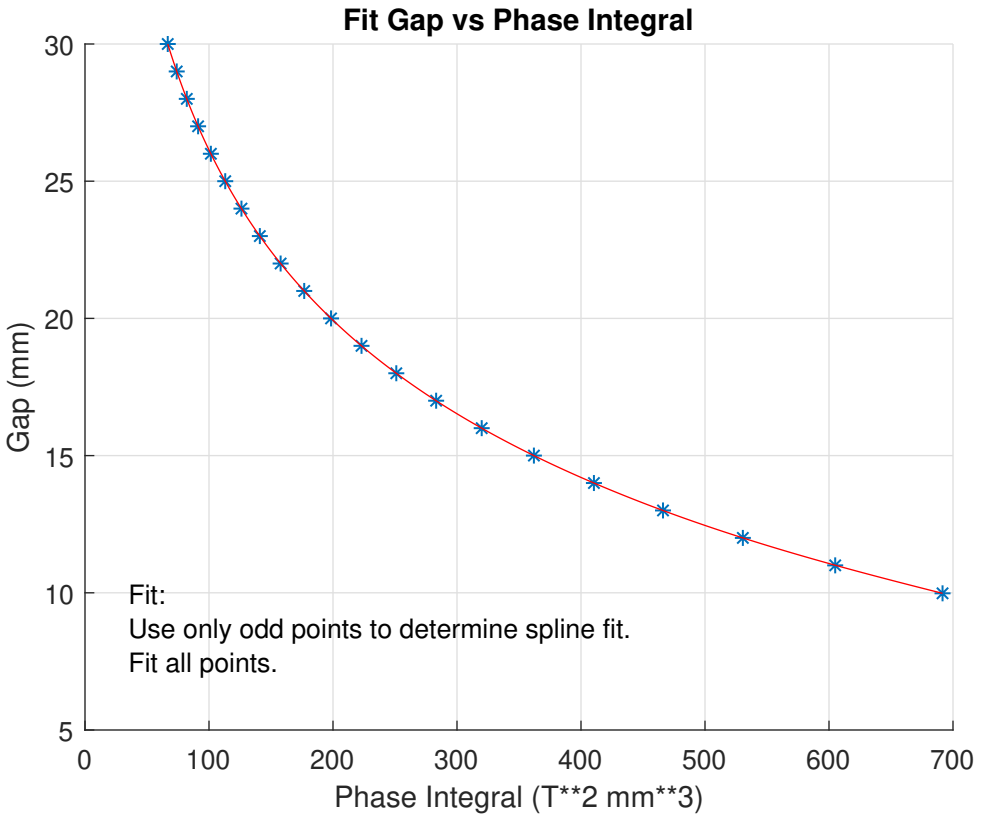

Gap vs Encoder Reading
Data
Fit
Fit:
Gap = p1 * enc + p2
p1 = -Inf (mm / count)
p2 = 3.4500e+01 (mm)
Gap = p1 * (enc + p3)
p1 = -Inf (mm / count)
p3 = 0
Gap (mm)
Encoder
120
100
80
60
40
20
0
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1

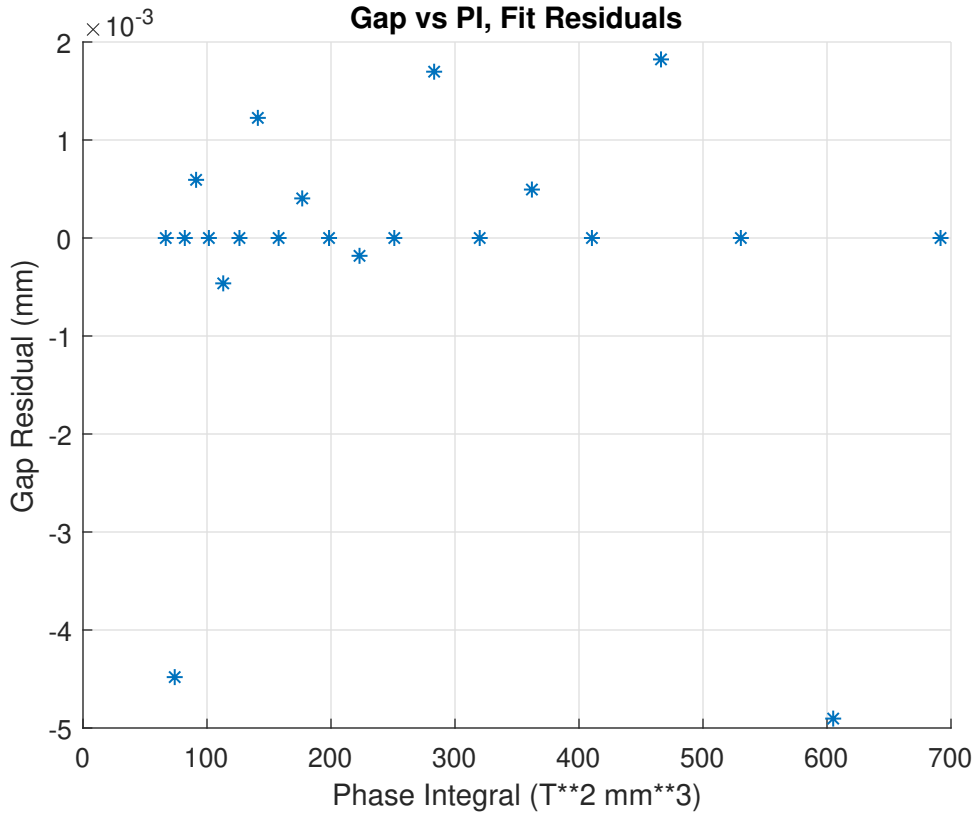

All Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T^2 mm^3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
0
100
200
300
400
500
600
700
0
20
40
60
80
100
120

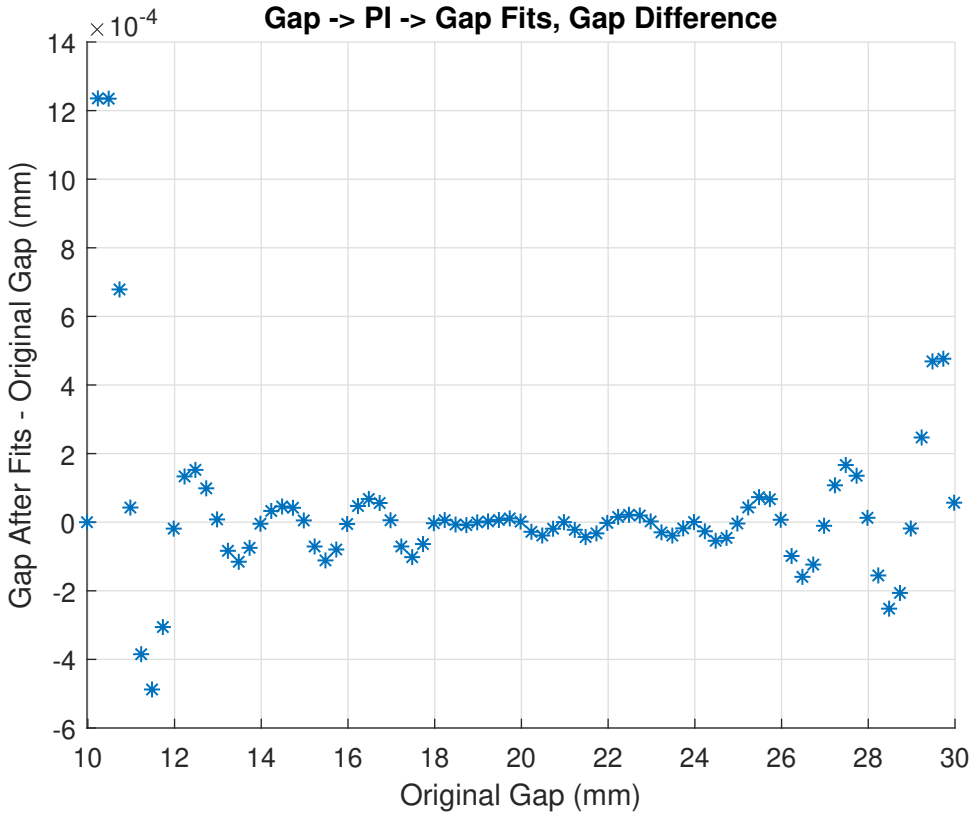

All Gaps, Normalized Residuals
PI Residual / PI
Gap (mm)
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
0
20
40
60
80
100
120

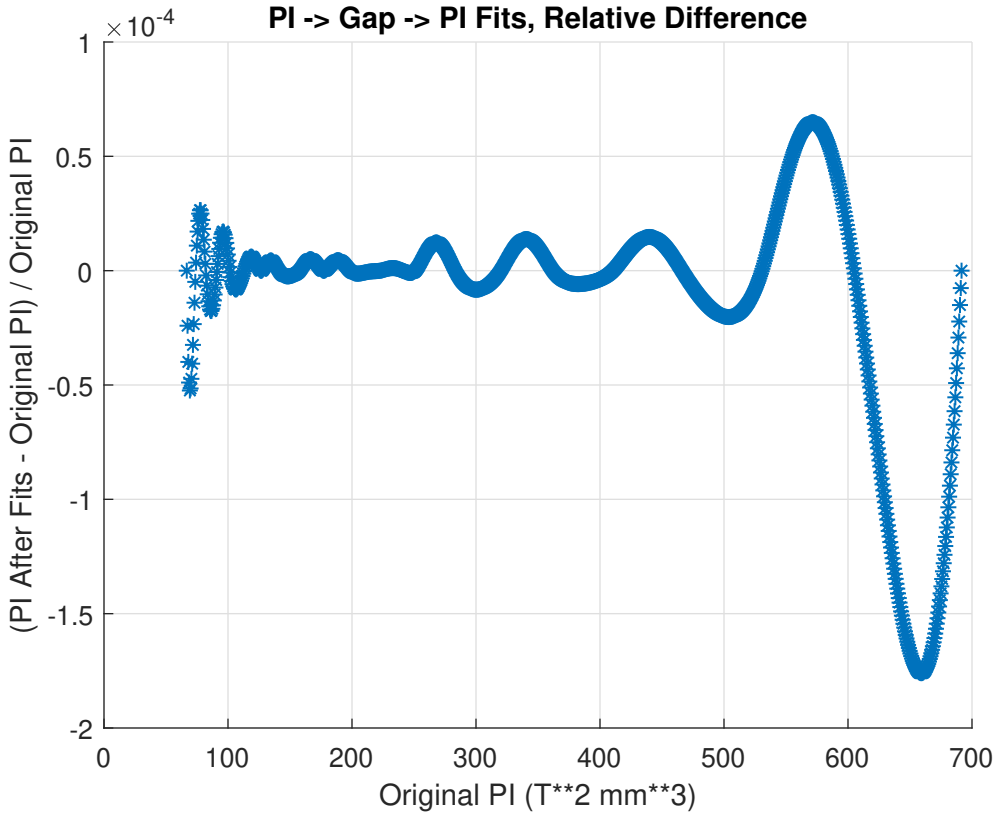

Operating Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T^2 mm^3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
0
100
200
300
400
500
600
700
5
10
15
20
25
30

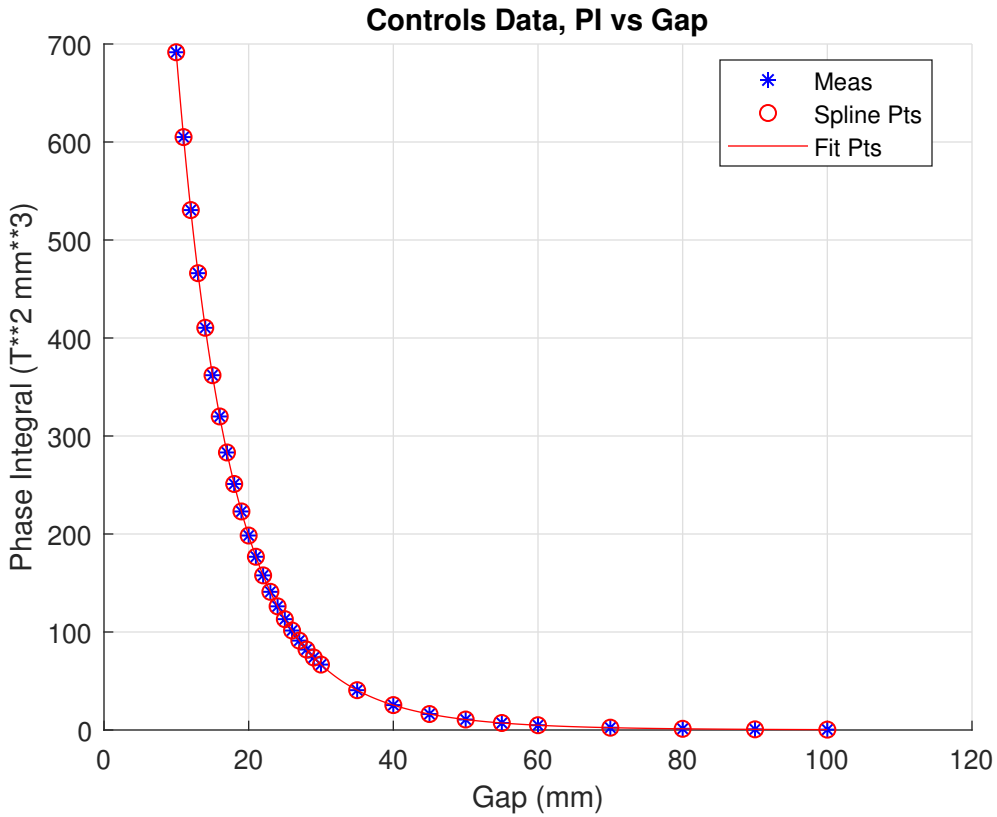

Operating Gaps, Normalized Residuals
×10-4
6
5
4
3
2
1
0
-1
-2
-3
PI Residual / PI
5
10
15
20
25
30
Gap (mm)

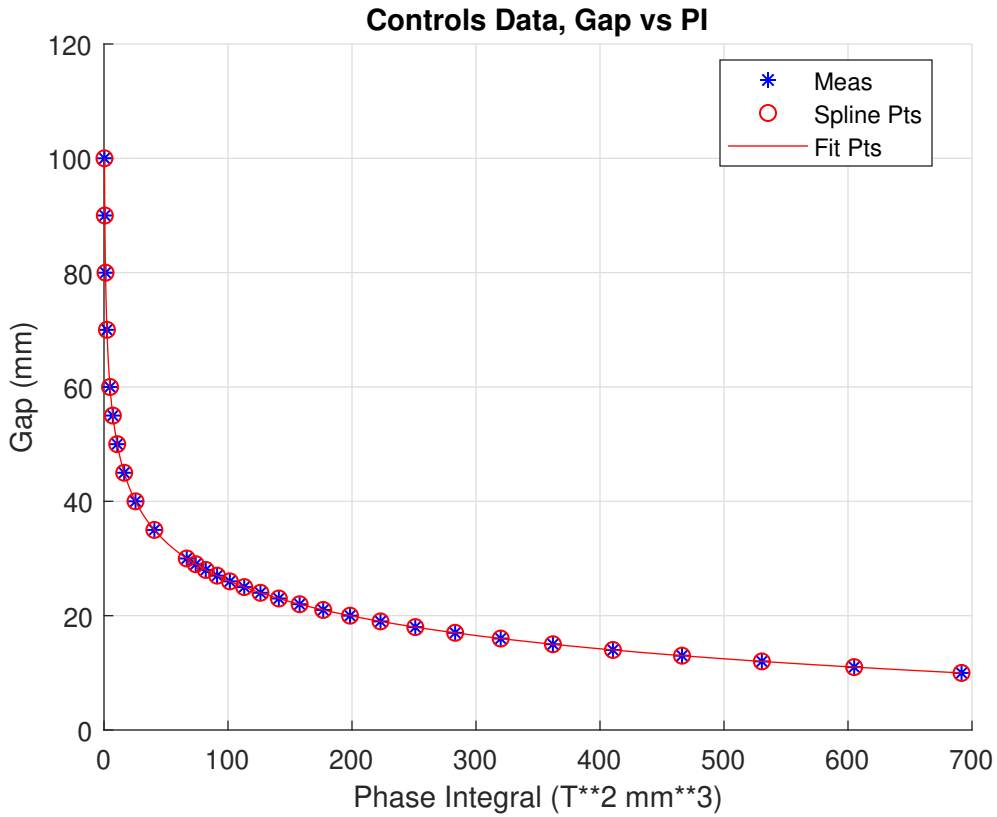

Fit Gap vs Phase Integral
Gap (mm)
Phase Integral (T**2 mm**3)
30
25
20
15
10
5
0
100
200
300
400
500
600
700
Fit:
Use only odd points to determine spline fit.
Fit all points.


Gap vs PI, Fit Residuals
×10-3
2
1
0
-1
-2
-3
-4
-5
Gap Residual (mm)
0
100
200
300
400
500
600
700
Phase Integral (T**2 mm**3)


Gap -> PI -> Gap Fits, Gap Difference
×10^-4
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^-4
1
0.5
0
-0.5
-1
-1.5
-2
(PI After Fits - Original PI) / Original PI
0
100
200
300
400
500
600
700
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
0
20
40
60
80
100
120


Controls Data, Gap vs PI
Meas
Spline Pts
Fit Pts
Gap (mm)
Phase Integral (T**2 mm**3)
0
20
40
60
80
100
120
0
100
200
300
400
500
600
700