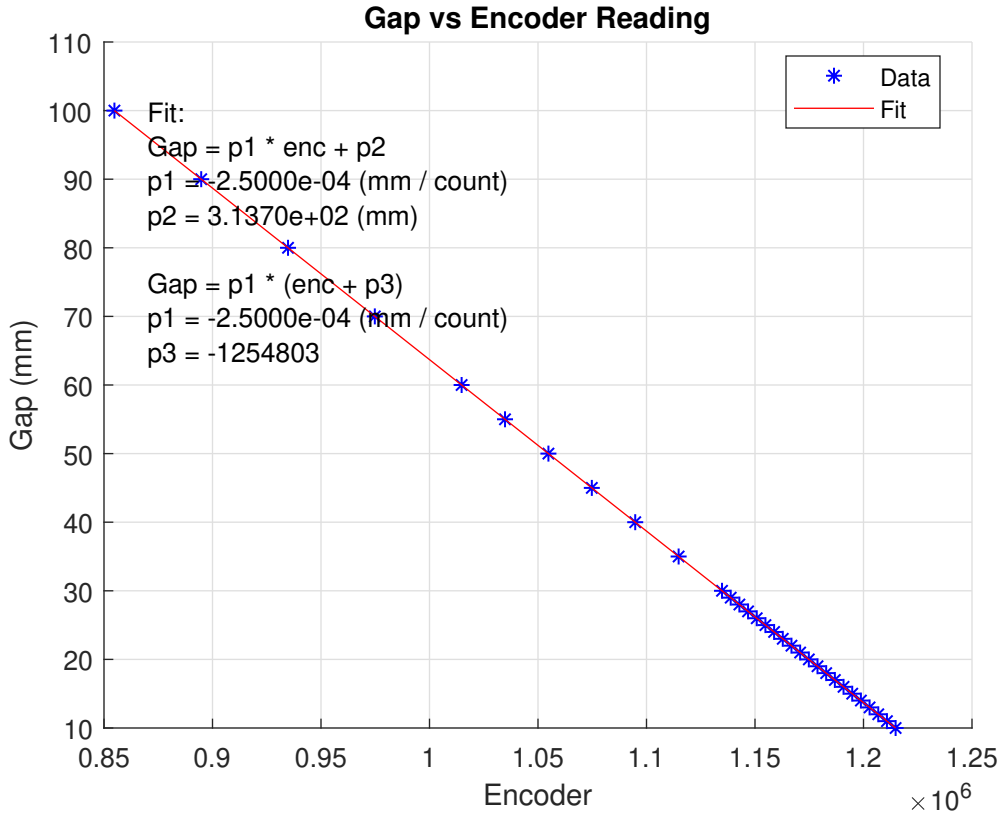
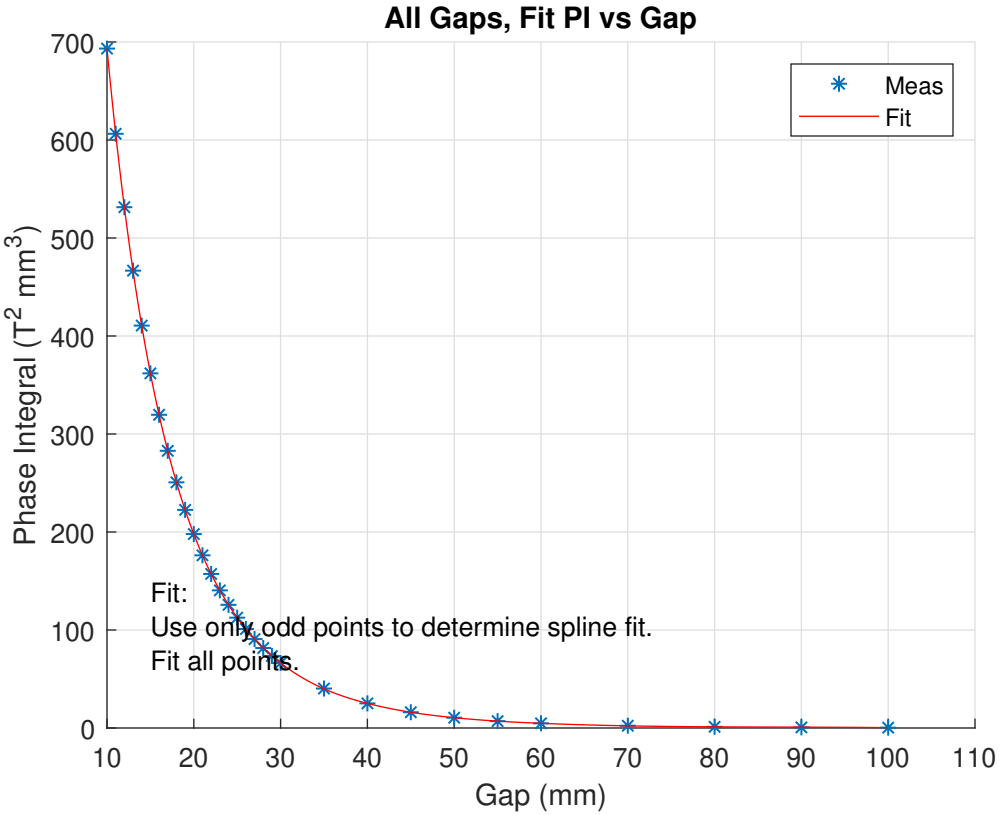
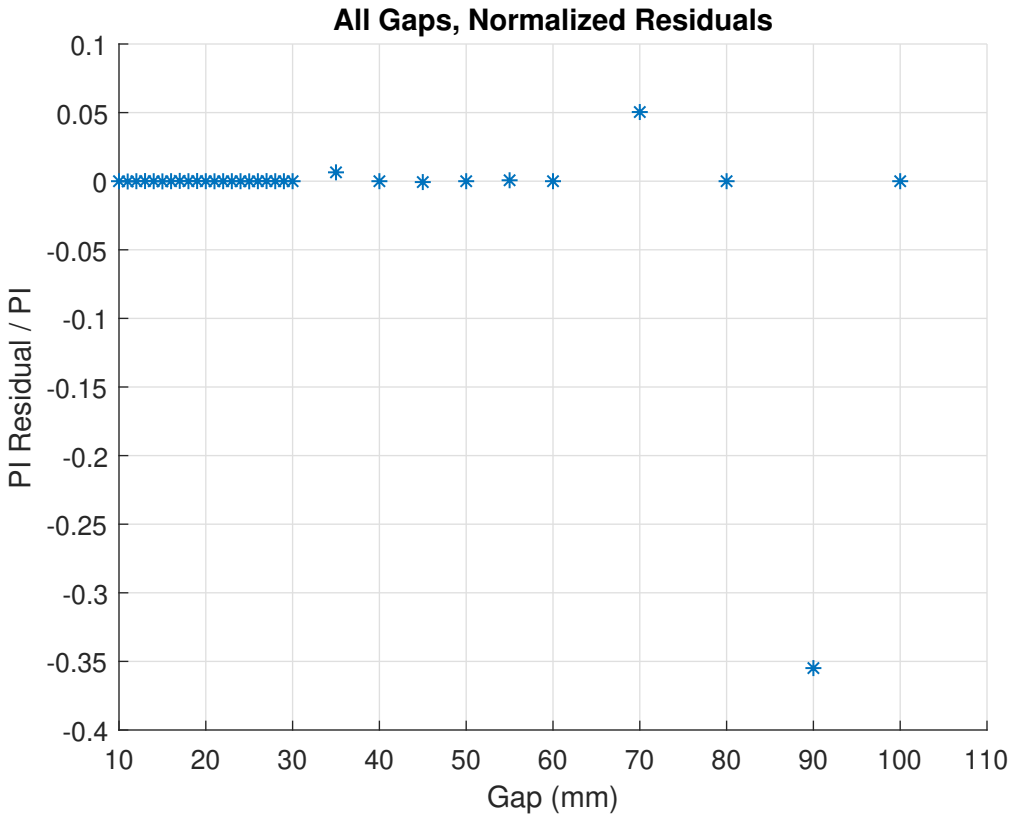
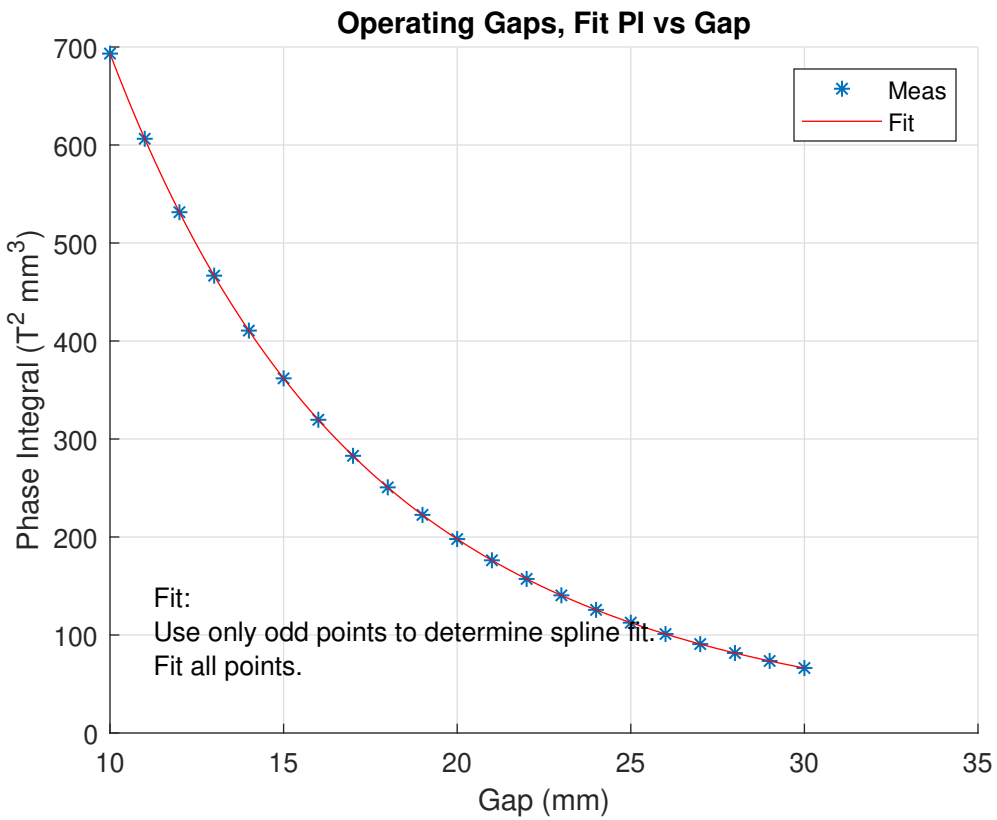
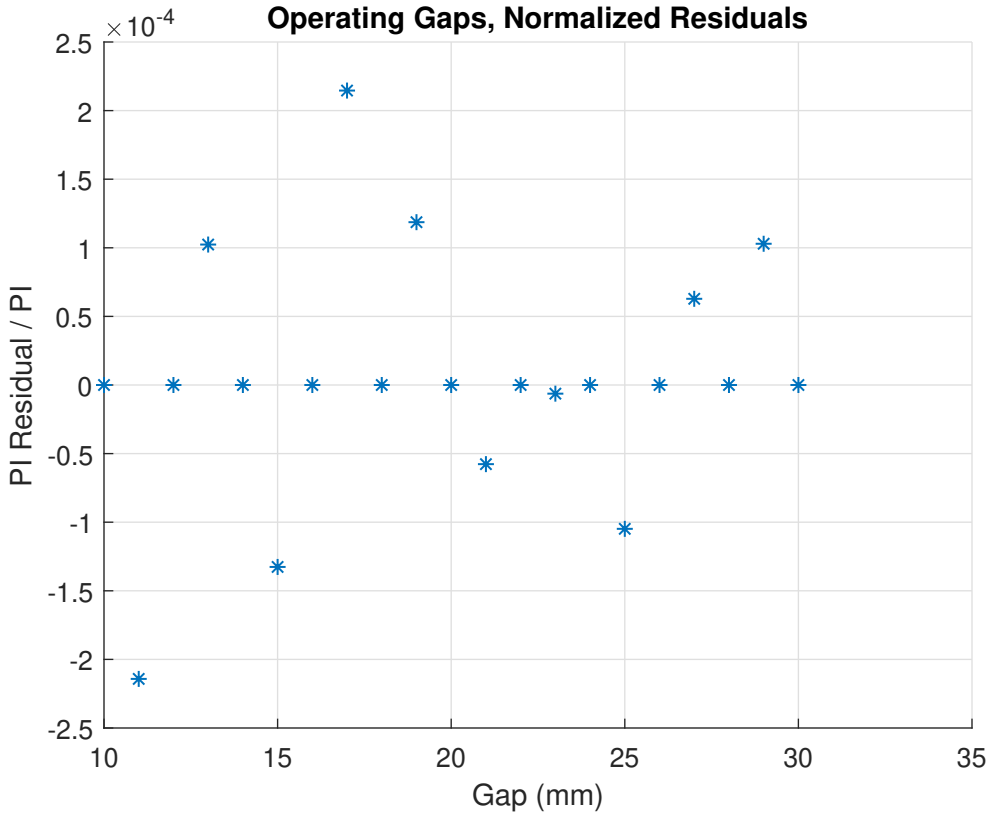
SLAC Magnetic Measurements#
Date: 01-24-2019#
Time: 08:31:26#

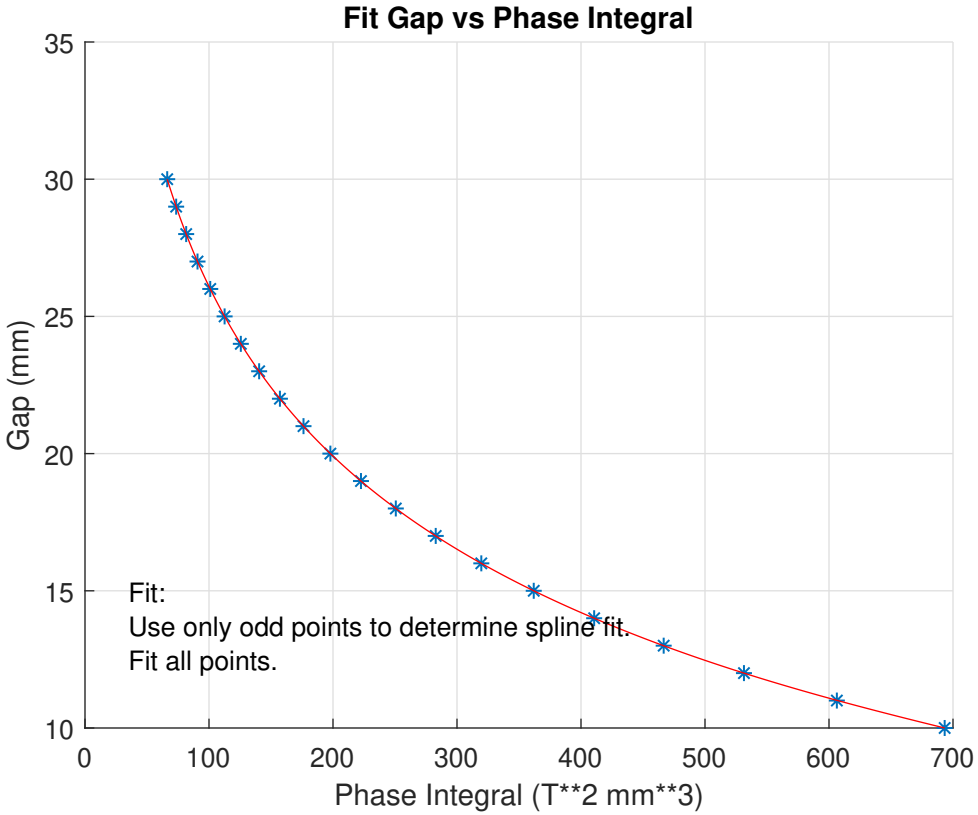

Gap vs Encoder Reading
Data
Fit
Fit:
Gap = p1 * enc + p2
p1 = -2.5000e-04 (mm / count)
p2 = 3.1370e+02 (mm)
Gap = p1 * (enc + p3)
p1 = -2.5000e-04 (mm / count)
p3 = -1254803
Gap (mm)
Encoder
×10^6
110
100
90
80
70
60
50
40
30
20
10
0.85
0.9
0.95
1
1.05
1.1
1.15
1.2
1.25

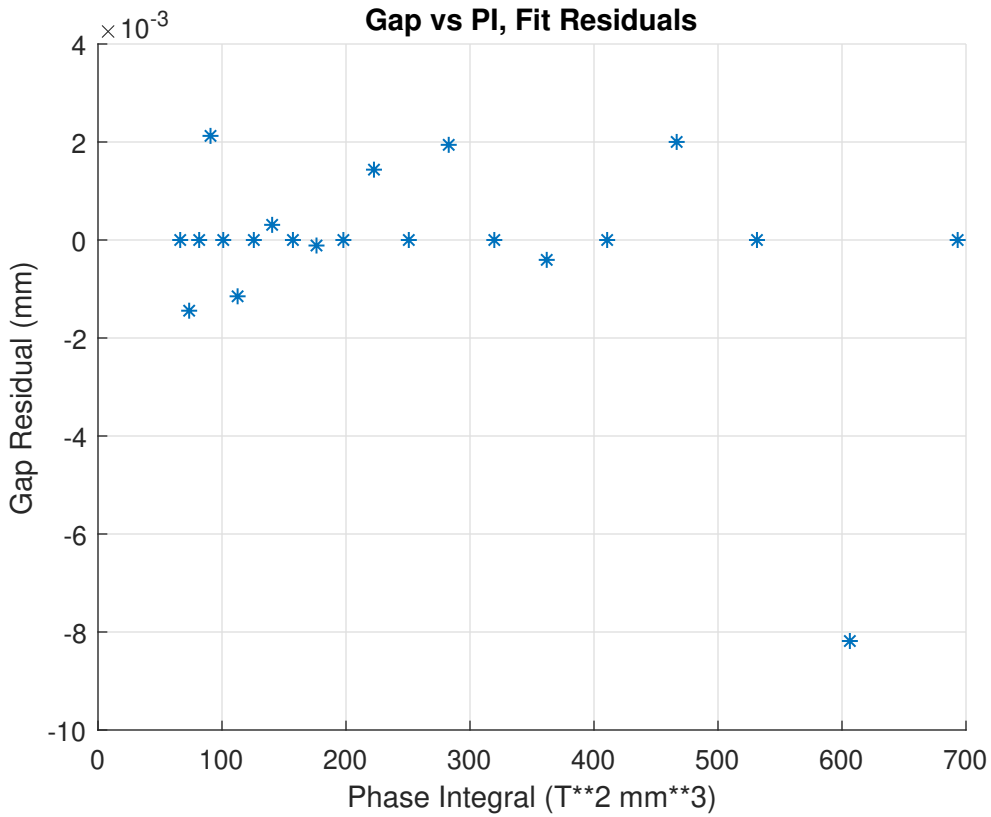

All Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T2 mm3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
0
100
200
300
400
500
600
700
10
20
30
40
50
60
70
80
90
100
110

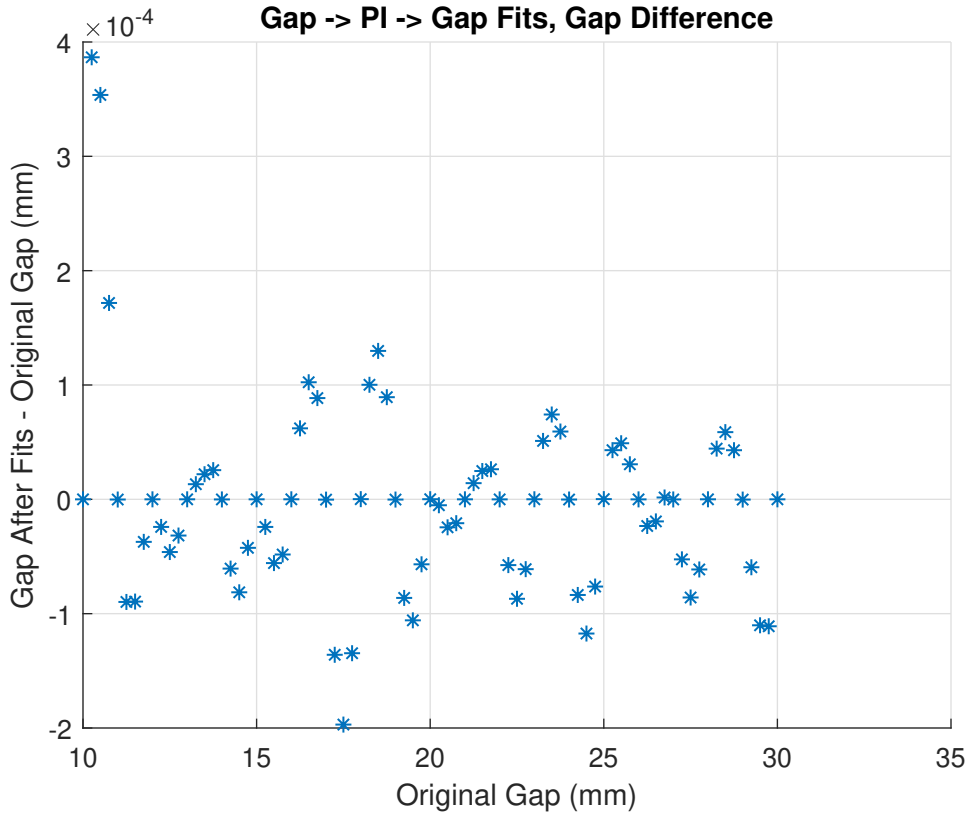

All Gaps, Normalized Residuals
PI Residual / PI
Gap (mm)
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
-0.25
-0.3
-0.35
-0.4
10
20
30
40
50
60
70
80
90
100
110

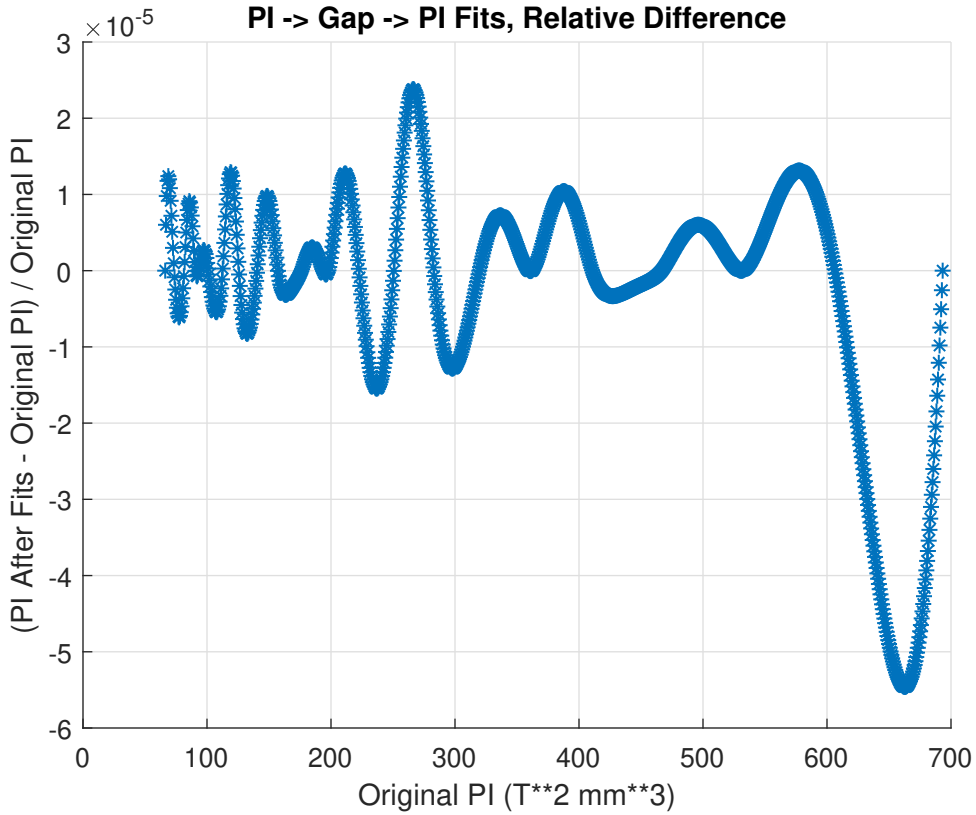

Operating Gaps, Fit PI vs Gap
Meas
Fit
Phase Integral (T2 mm3)
Gap (mm)
Fit:
Use only odd points to determine spline fit.
Fit all points.
0
100
200
300
400
500
600
700
10
15
20
25
30
35

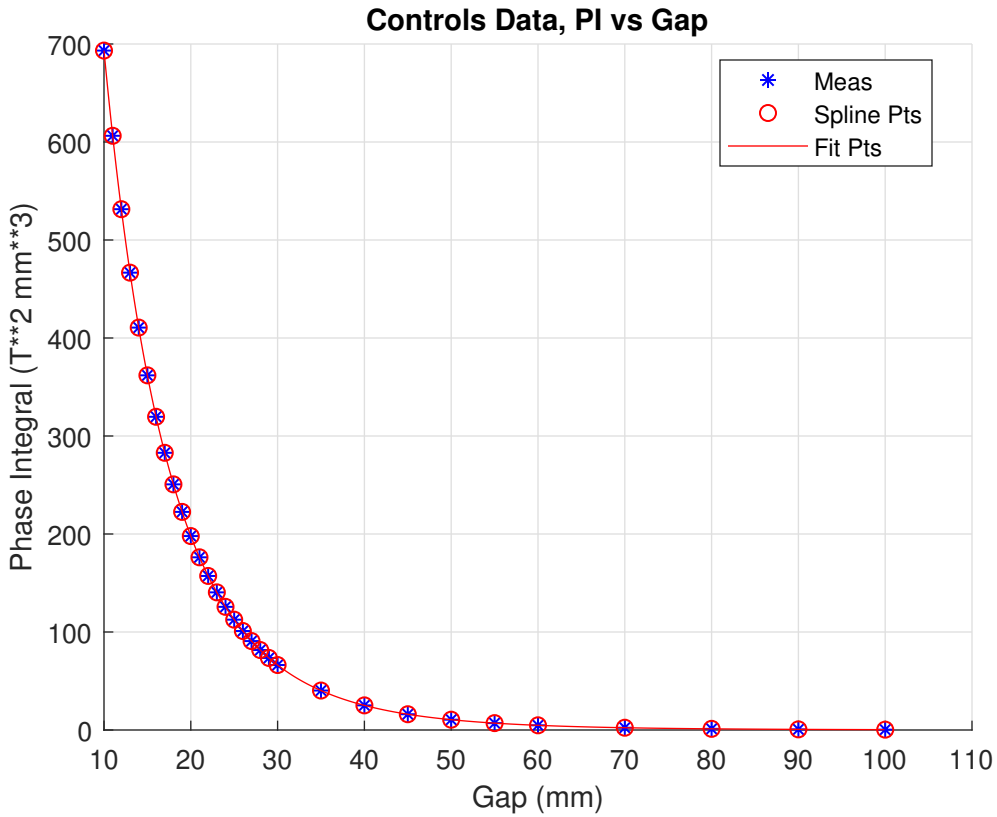

Operating Gaps, Normalized Residuals
×10^-4
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
PI Residual / PI
10
15
20
25
30
35
Gap (mm)

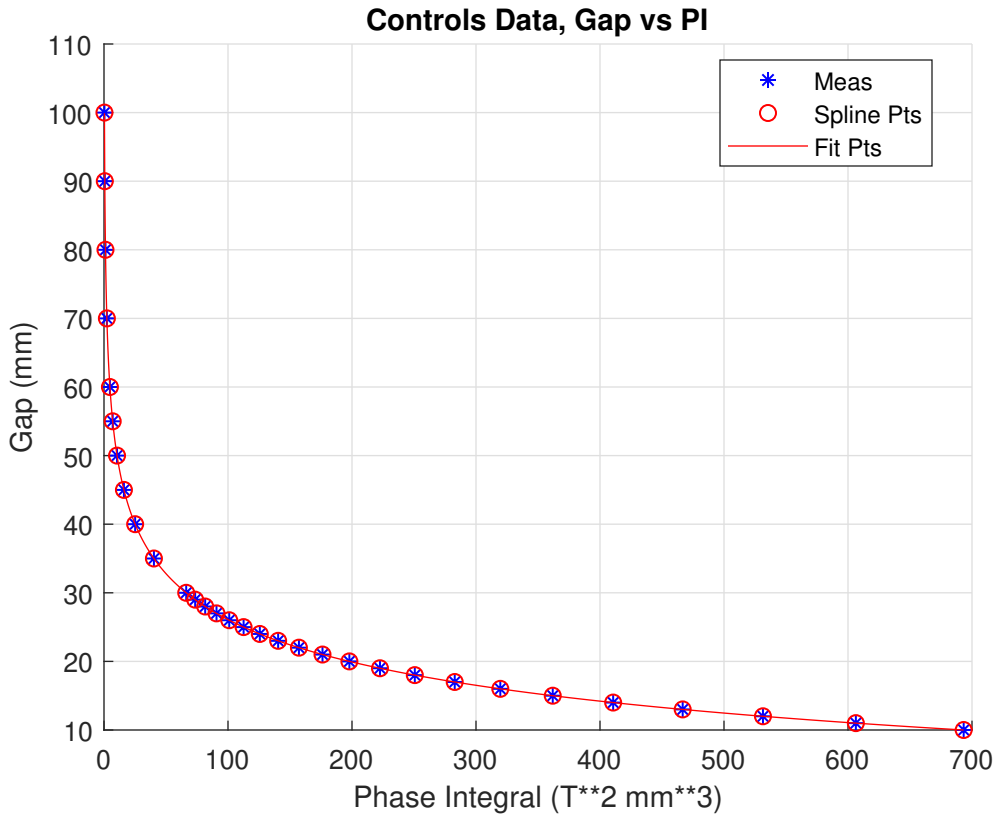

Fit Gap vs Phase Integral
Gap (mm)
Phase Integral (T**2 mm**3)
35
30
25
20
15
10
0
100
200
300
400
500
600
700
Fit:
Use only odd points to determine spline fit.
Fit all points.


Gap vs PI, Fit Residuals
×10-3
4
2
0
-2
-4
-6
-8
-10
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
4
3
2
1
0
-1
-2
Gap After Fits - Original Gap (mm)
10
15
20
25
30
35
Original Gap (mm)


PI -> Gap -> PI Fits, Relative Difference
×10^-5
3
2
1
0
-1
-2
-3
-4
-5
-6
(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)
700
600
500
400
300
200
100
0
10
20
30
40
50
60
70
80
90
100
110


Controls Data, Gap vs PI
Meas
Spline Pts
Fit Pts
Gap (mm)
Phase Integral (T**2 mm**3)
110
100
90
80
70
60
50
40
30
20
10
0
100
200
300
400
500
600
700