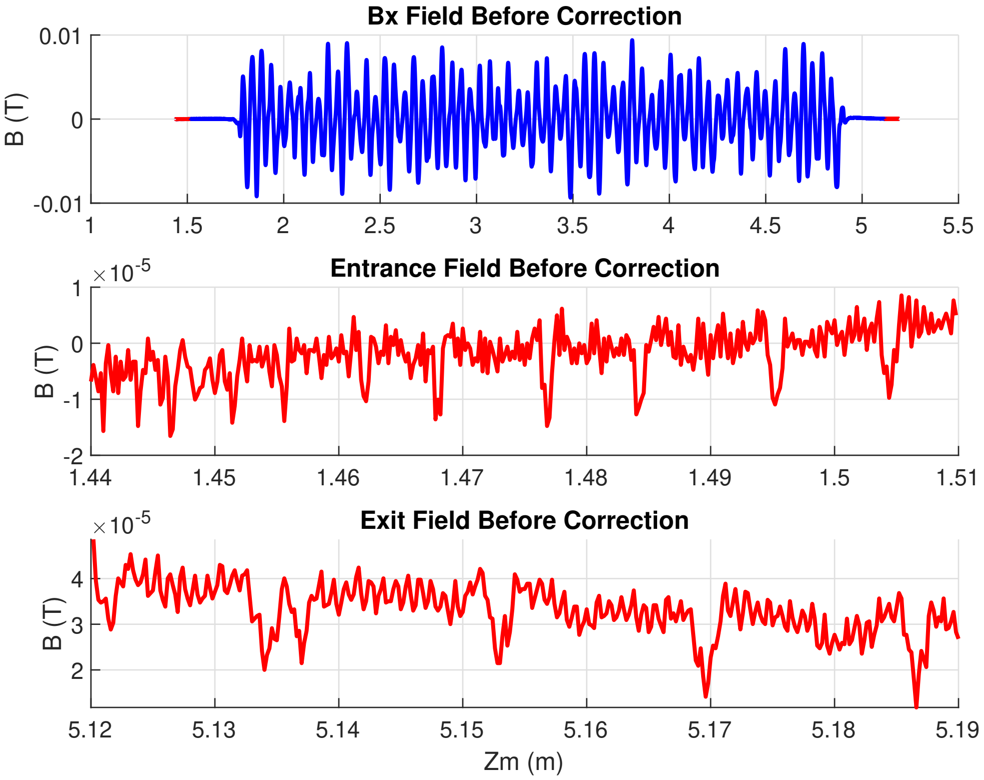
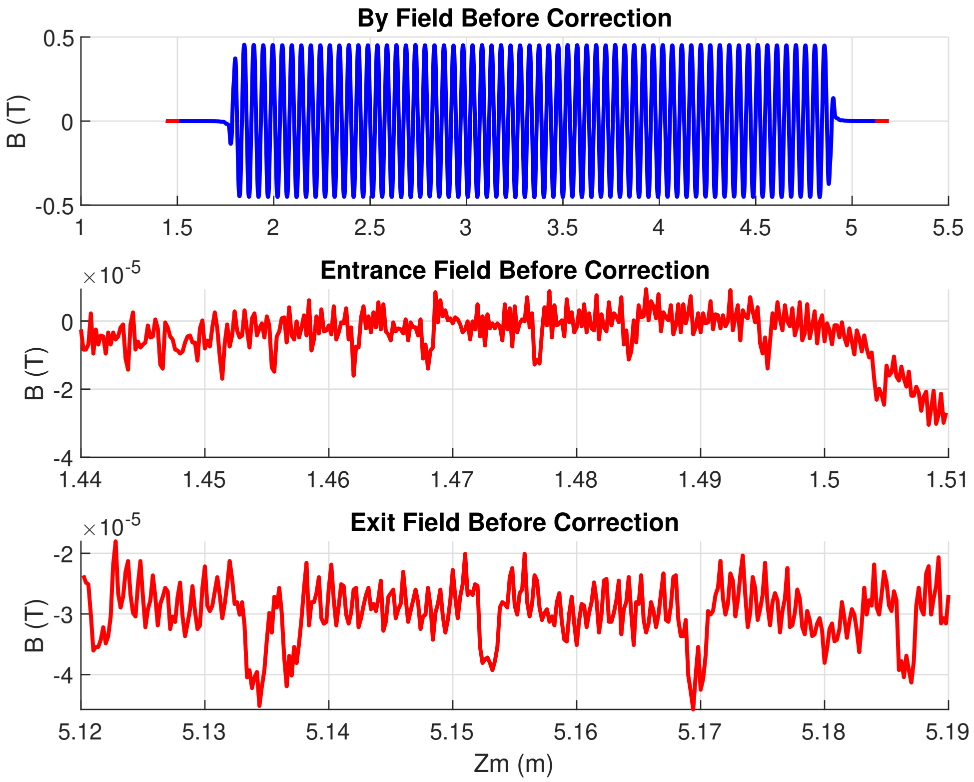
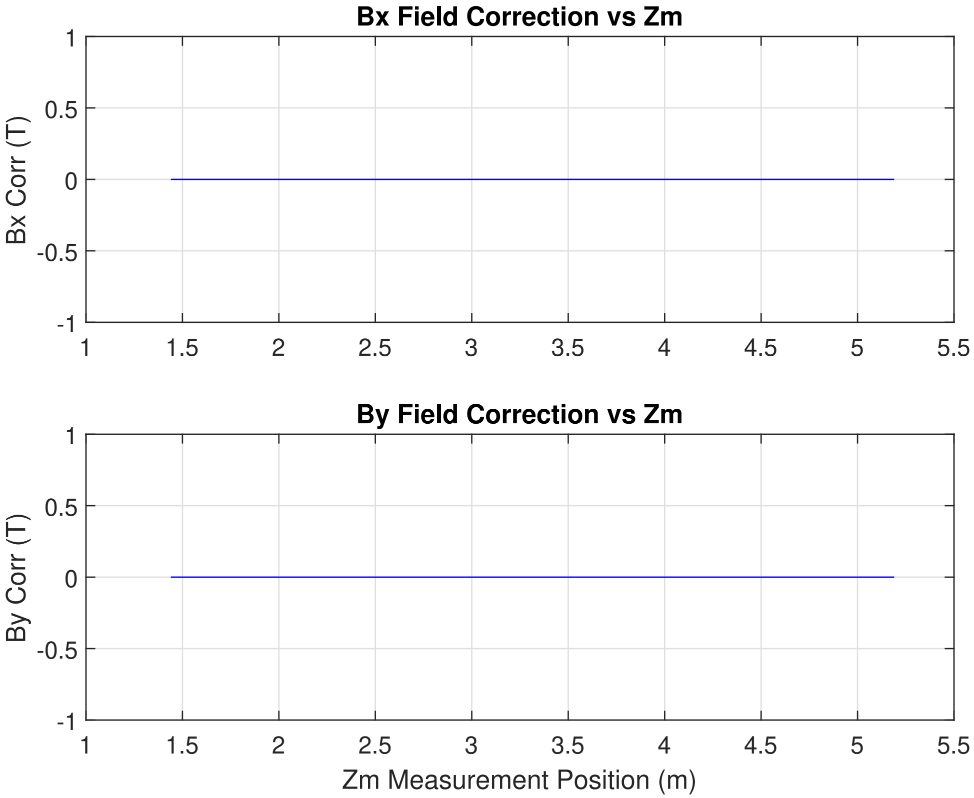
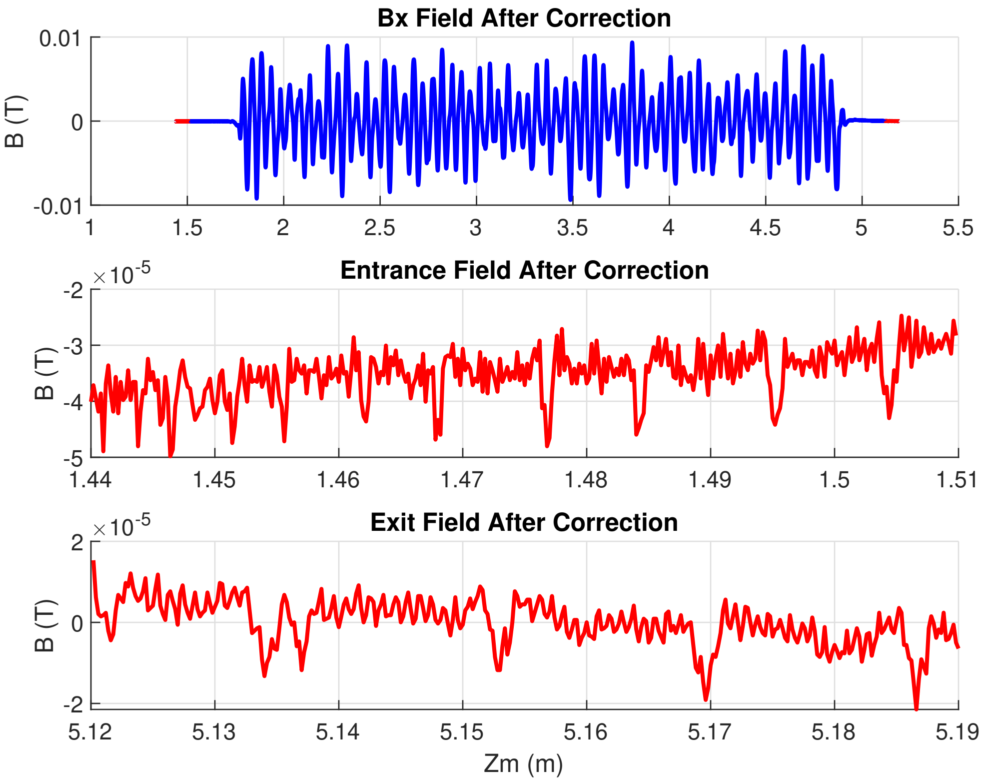
SLAC Magnetic Measurements
Date: 06-02-2026
Time: 13:01:07

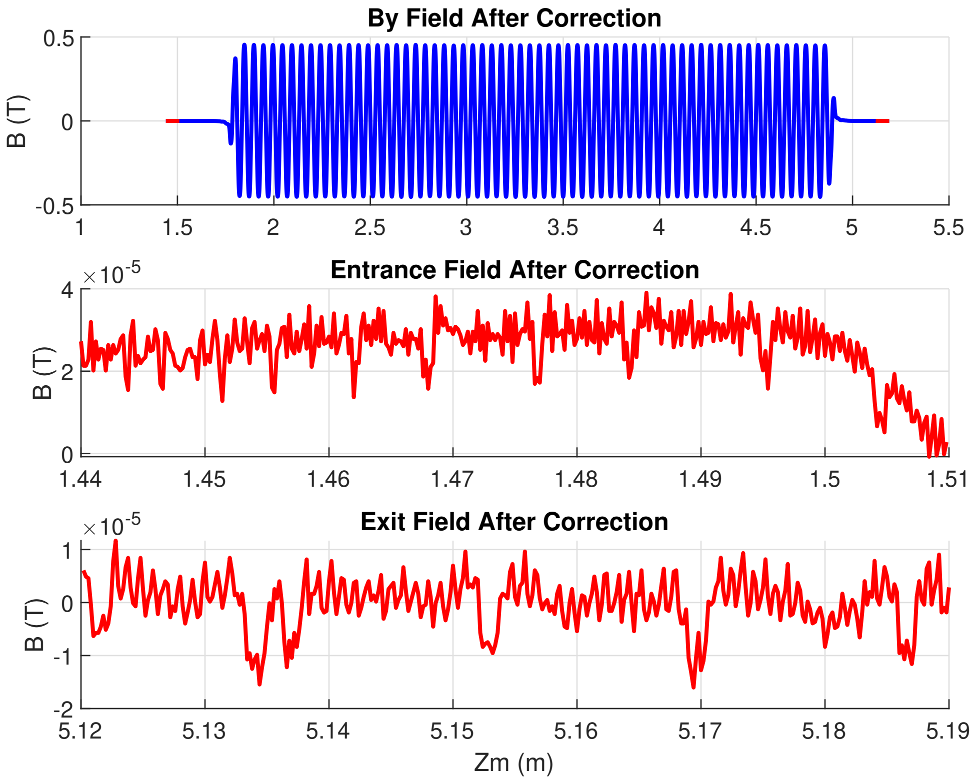
Input File:
Dir = S:\magdata\LCLS-II-HE\Undulator\DELTA-II\QUADRANT 2\DATASET0001\Final Results\Z Scans\Run 0
Name = zscan.dat

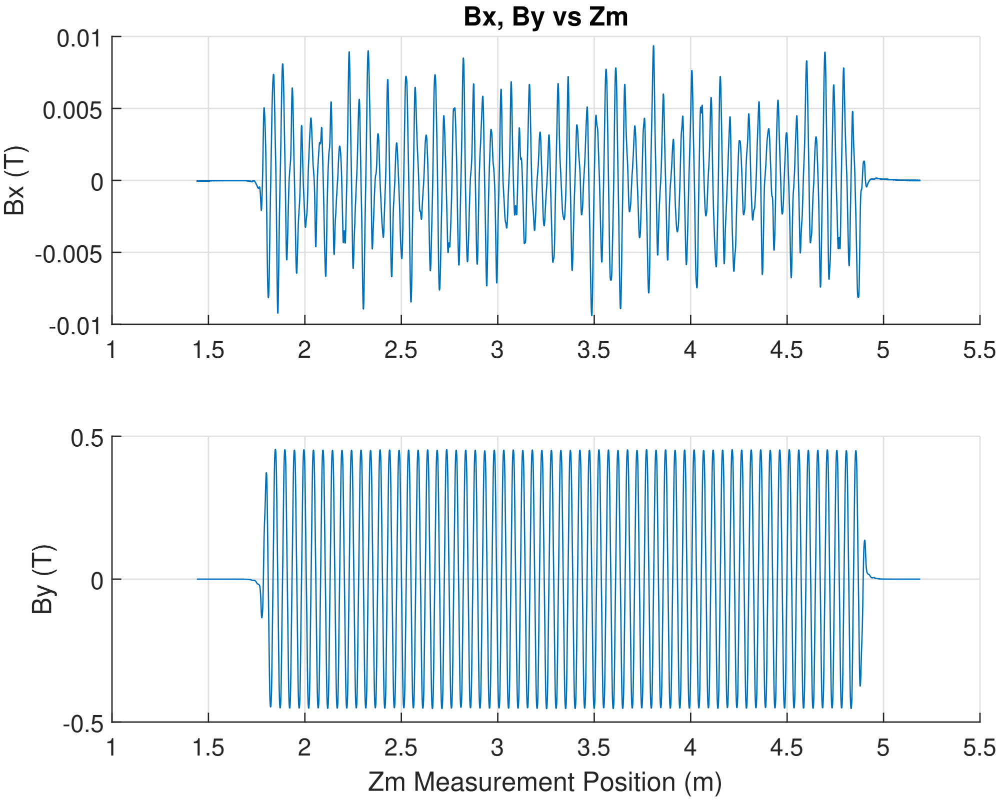

Bx Field Before Correction
B (T)
0.01
0
-0.01
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
Entrance Field Before Correction
×10-5
1
0
-1
-2
B (T)
1.44
1.45
1.46
1.47
1.48
1.49
1.5
1.51
Exit Field Before Correction
×10-5
4
3
2
B (T)
5.12
5.13
5.14
5.15
5.16
5.17
5.18
5.19
Zm (m)

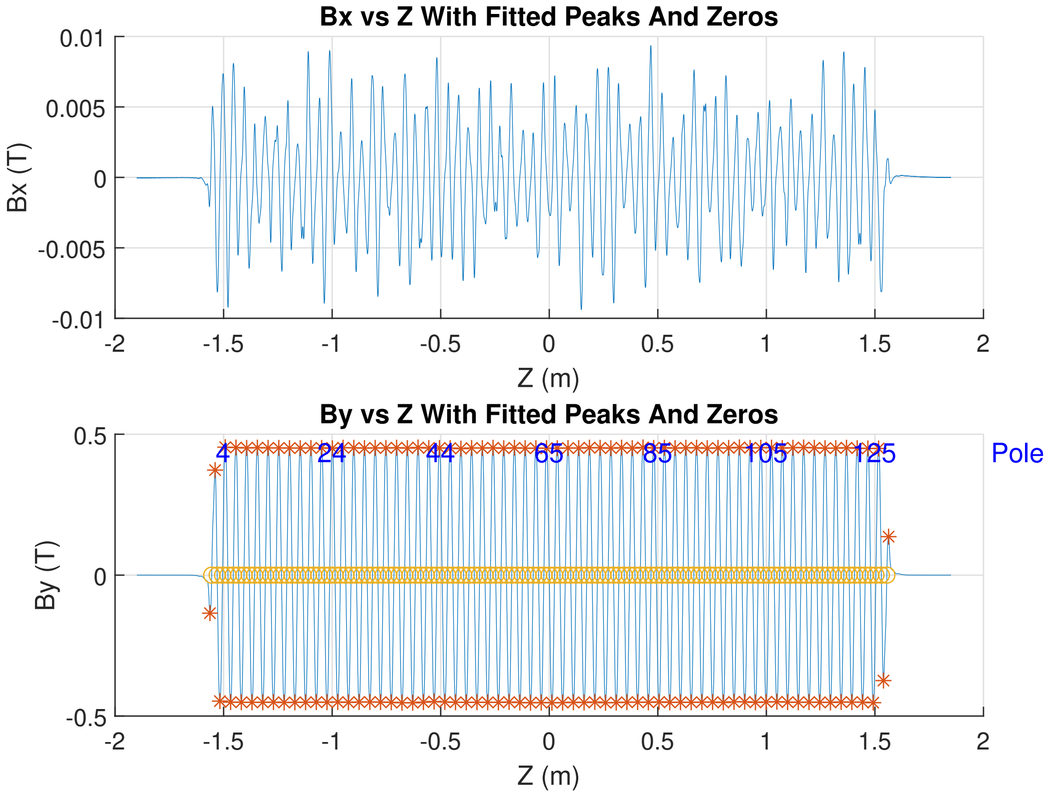

By Field Before Correction
B (T)
0.5
0
-0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
Entrance Field Before Correction
$\times 10^{-5}$
B (T)
0
-2
-4
1.44
1.45
1.46
1.47
1.48
1.49
1.5
1.51
Exit Field Before Correction
$\times 10^{-5}$
B (T)
-2
-3
-4
5.12
5.13
5.14
5.15
5.16
5.17
5.18
5.19
Zm (m)


Bx Field Correction vs Zm
Bx Corr (T)
1
0.5
0
-0.5
-1
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
By Field Correction vs Zm
By Corr (T)
1
0.5
0
-0.5
-1
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
Zm Measurement Position (m)

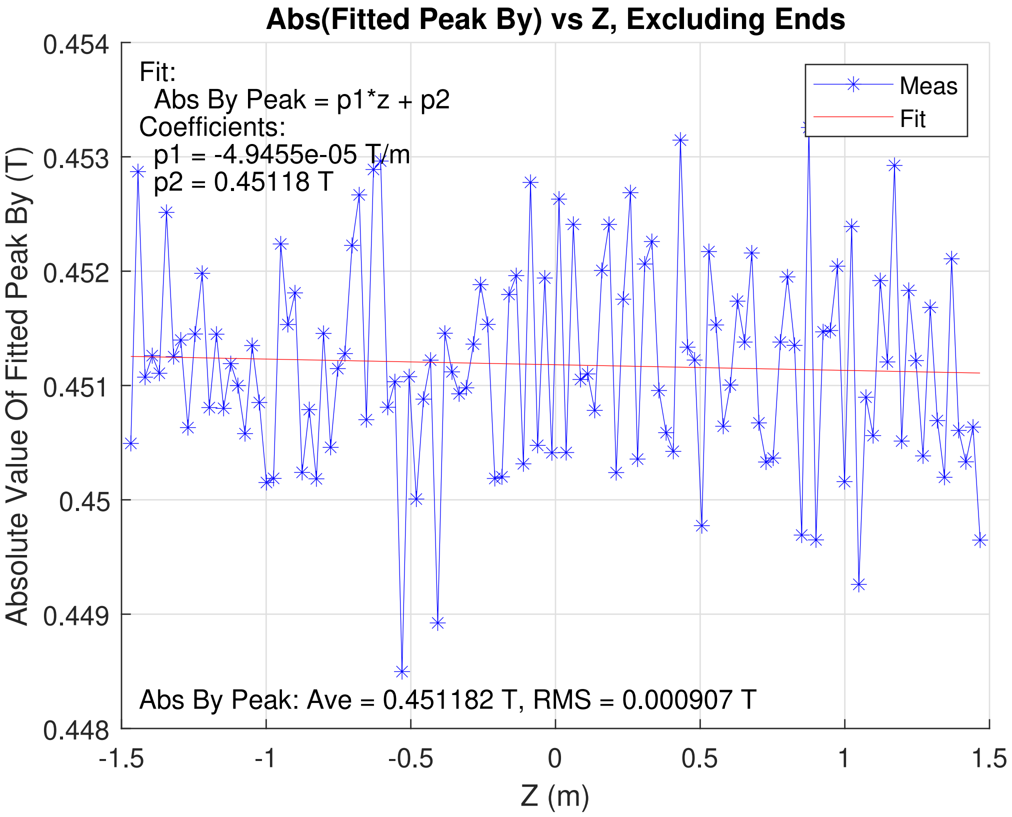

Bx Field After Correction
B (T)
0.01
0
-0.01
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
Entrance Field After Correction
×10^-5
-2
-3
-4
-5
B (T)
1.44
1.45
1.46
1.47
1.48
1.49
1.5
1.51
Exit Field After Correction
×10^-5
2
0
-2
B (T)
5.12
5.13
5.14
5.15
5.16
5.17
5.18
5.19
Zm (m)

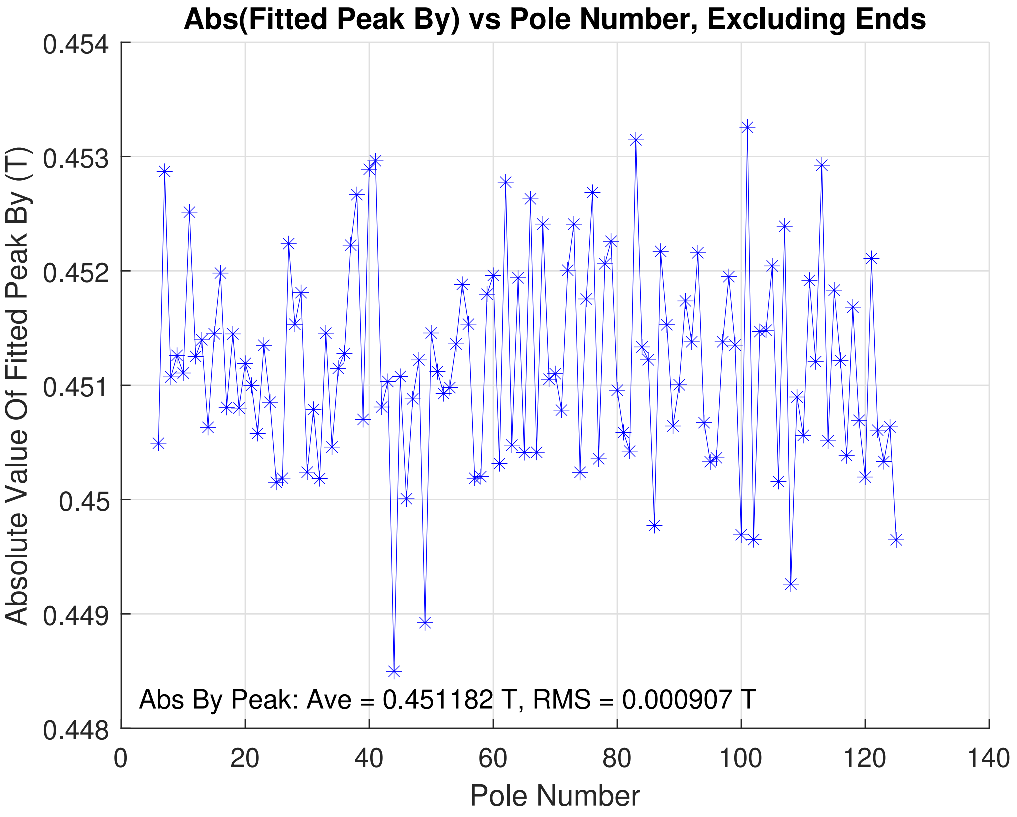

By Field After Correction
B (T)
0.5
0
-0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
Entrance Field After Correction
×10-5
B (T)
4
2
0
1.44
1.45
1.46
1.47
1.48
1.49
1.5
1.51
Exit Field After Correction
×10-5
B (T)
1
0
-1
-2
5.12
5.13
5.14
5.15
5.16
5.17
5.18
5.19
Zm (m)

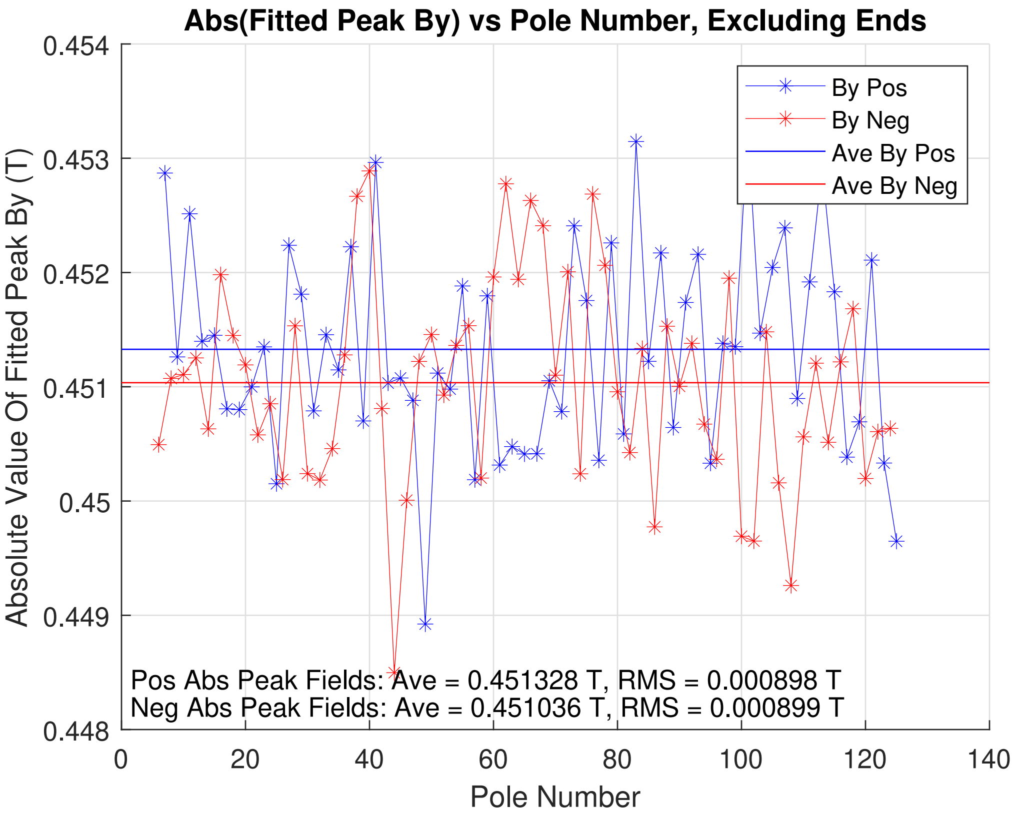

Bx, By vs Zm
Bx (T)
0.01
0.005
0
-0.005
-0.01
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
By (T)
0.5
0
-0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
Zm Measurement Position (m)


Bx vs Z With Fitted Peaks And Zeros

By vs Z With Fitted Peaks And Zeros

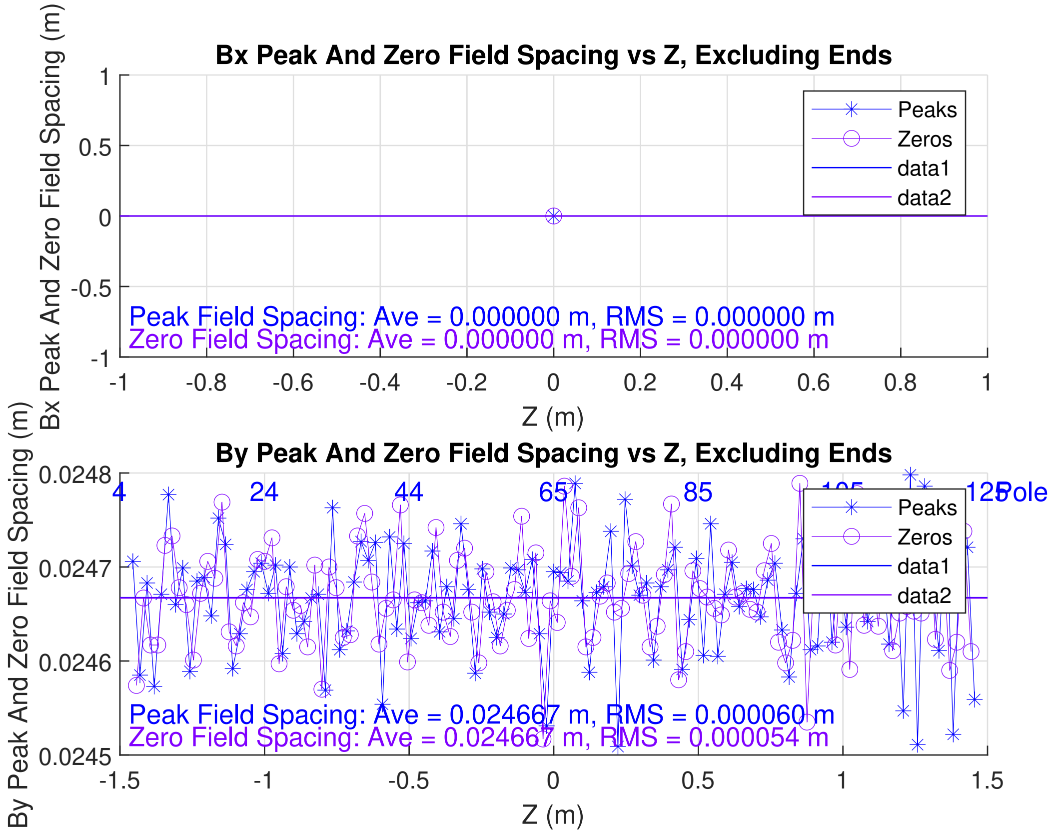

Abs(Fitted Peak By) vs Z, Excluding Ends
Fit:
Abs By Peak = p1*z + p2
Coefficients:
p1 = -4.9455e-05 T/m
p2 = 0.45118 T
Meas
Fit
Abs By Peak: Ave = 0.451182 T, RMS = 0.000907 T
Absolute Value Of Fitted Peak By (T)
0.454
0.453
0.452
0.451
0.45
0.449
0.448
-1.5
-1
-0.5
0
0.5
1
1.5
Z (m)

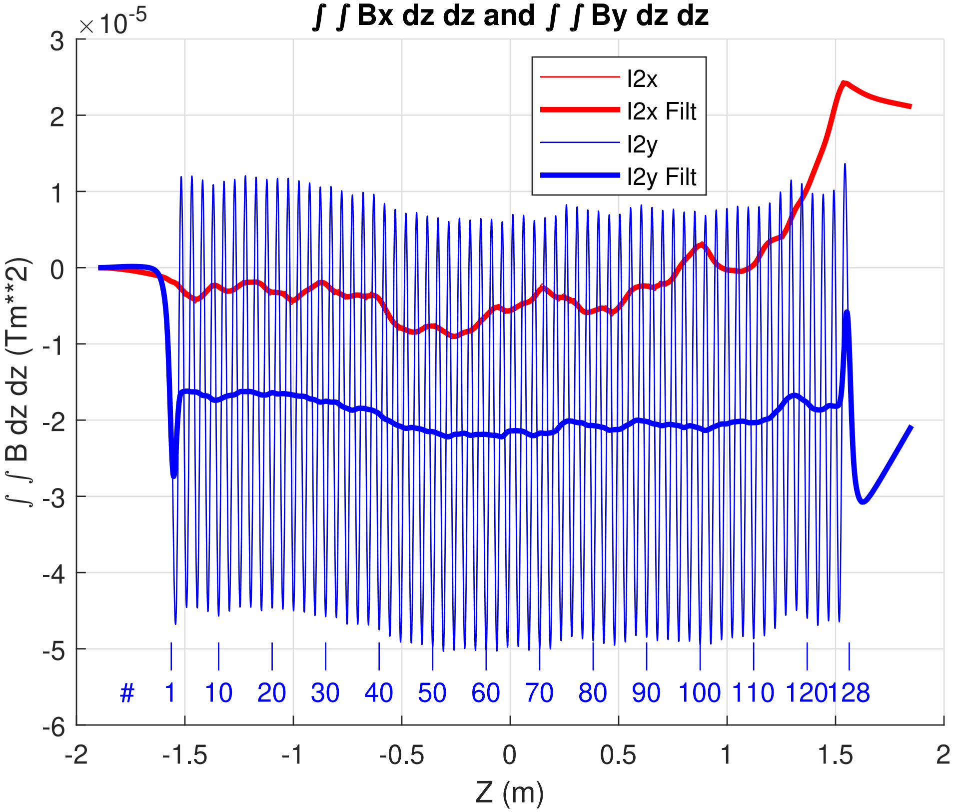

Abs(Fitted Peak By) vs Pole Number, Excluding Ends
Absolute Value Of Fitted Peak By (T)
0.454
0.453
0.452
0.451
0.45
0.449
0.448
Abs By Peak: Ave = 0.451182 T, RMS = 0.000907 T
0
20
40
60
80
100
120
140
Pole Number

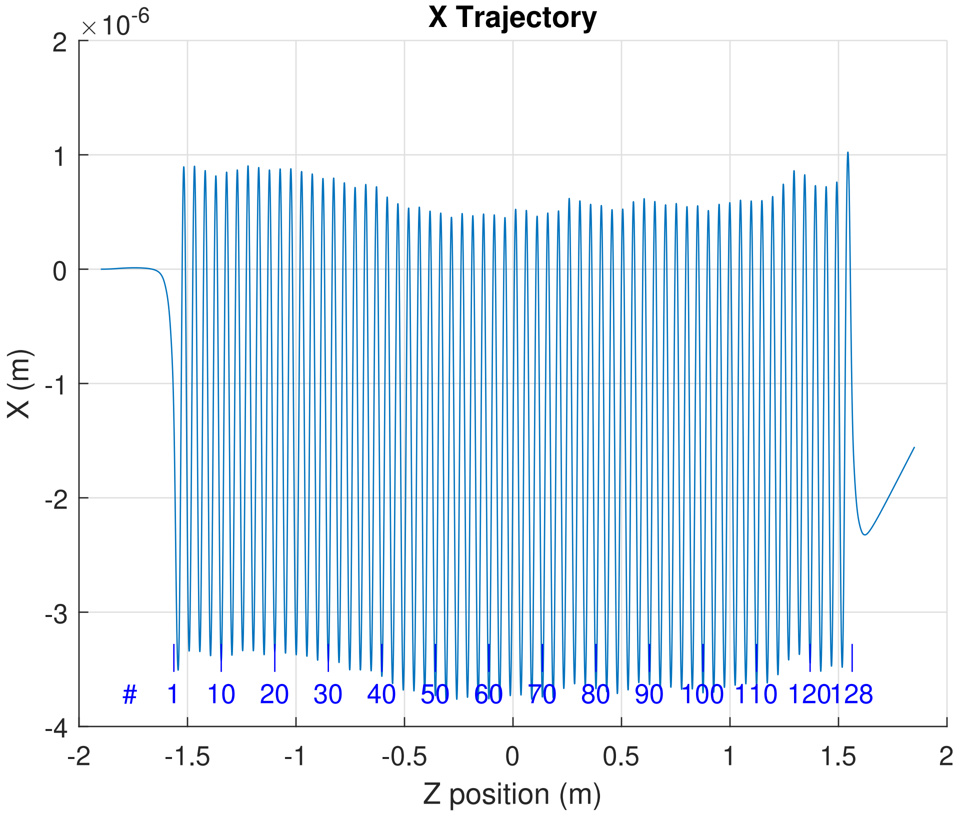


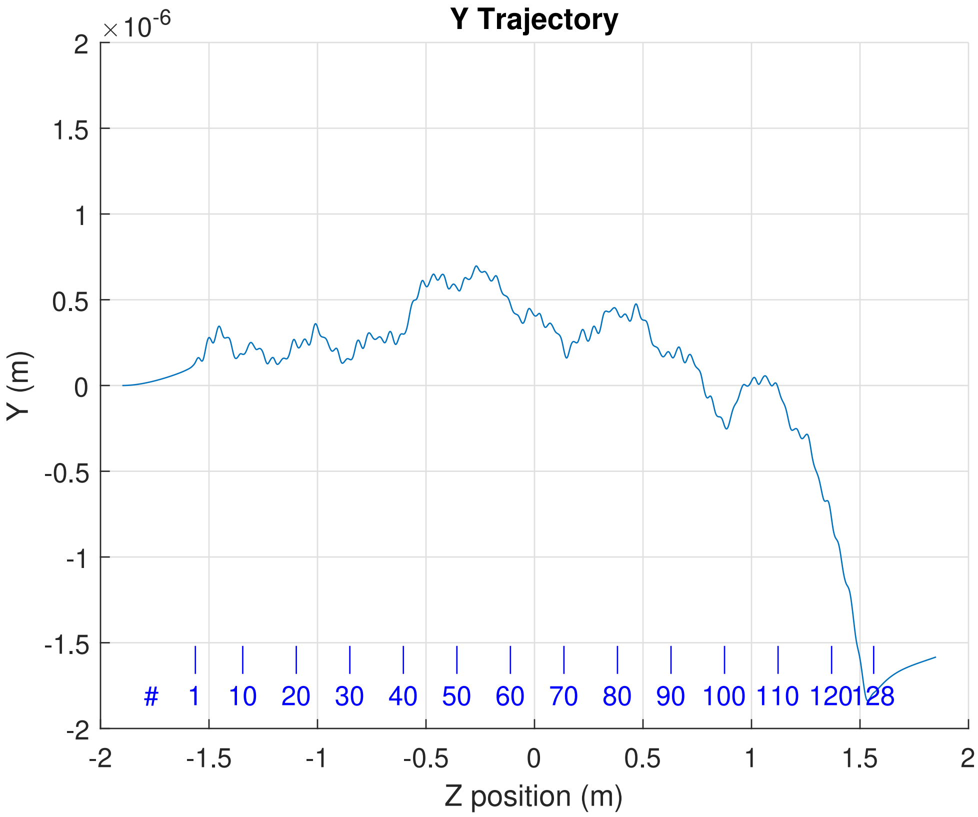
Abs(Fitted Peak By) vs Pole Number, Excluding Ends

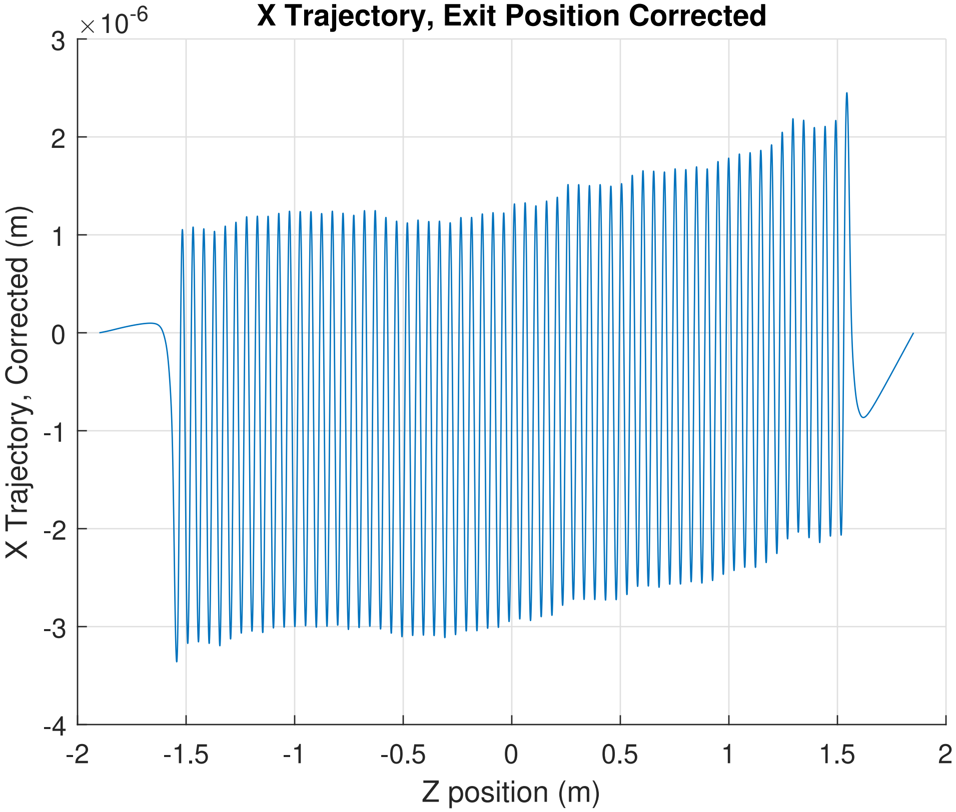
Pos Abs Peak Fields: Ave = 0.451328 T, RMS = 0.000898 T
Neg Abs Peak Fields: Ave = 0.451036 T, RMS = 0.000899 T


Bx Peak And Zero Field Spacing vs Z, Excluding Ends
Bx Peak And Zero Field Spacing (m)
1
0.5
0
-0.5
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
Z (m)
Peaks
Zeros
data1
data2
Peak Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
Zero Field Spacing: Ave = 0.000000 m, RMS = 0.000000 m
By Peak And Zero Field Spacing vs Z, Excluding Ends
By Peak And Zero Field Spacing (m)
0.0248
0.0247
0.0246
0.0245
-1.5
-1
-0.5
0
0.5
1
1.5
Z (m)
4
24
44
65
85
105
125
Pole
Peaks
Zeros
data1
data2
Peak Field Spacing: Ave = 0.024667 m, RMS = 0.000060 m
Zero Field Spacing: Ave = 0.024667 m, RMS = 0.000054 m

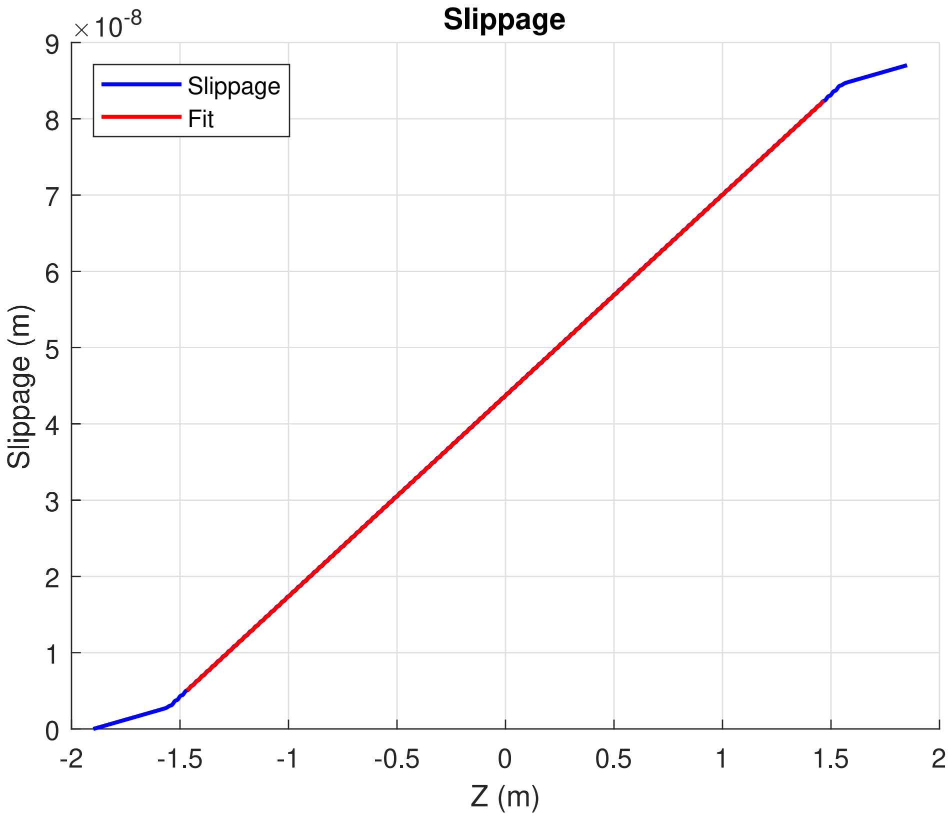

∫ ∫ Bx dz dz and ∫ ∫ By dz dz
×10^-5
3
2
1
0
-1
-2
-3
-4
-5
-6
∫ ∫ B dz dz (Tm**2)
I2x
I2x Filt
I2y
I2y Filt
#
1
10
20
30
40
50
60
70
80
90
100
110
120
128
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)

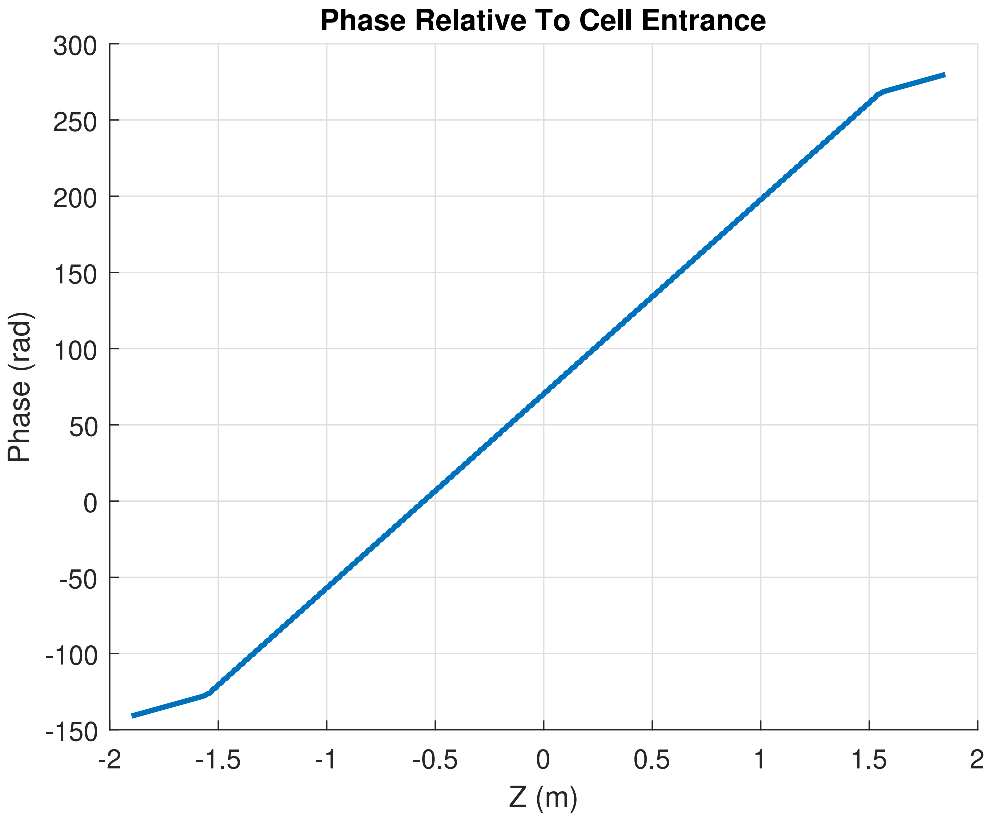

X Trajectory
×10^-6
2
1
0
-1
-2
-3
-4
X (m)
#
1
10
20
30
40
50
60
70
80
90
100
110
120
128
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)

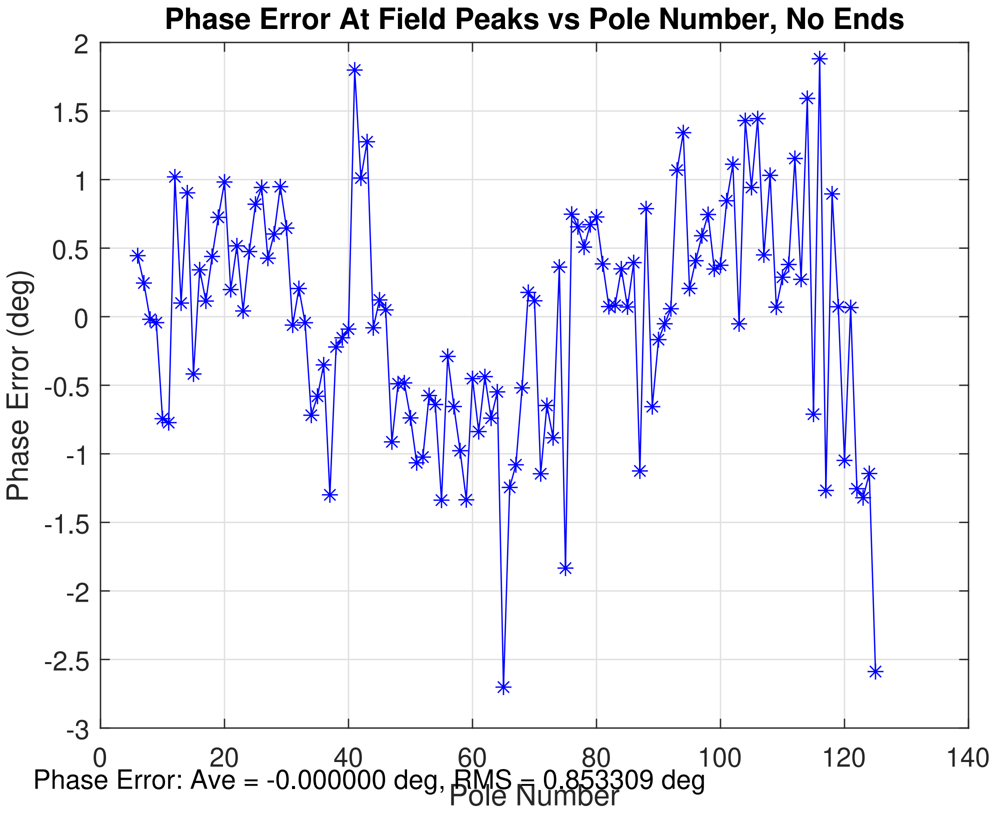

Y Trajectory
×10-6
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
Y (m)
#
1
10
20
30
40
50
60
70
80
90
100
110
120
128
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)


X Trajectory, Exit Position Corrected
×10^-6
3
2
1
0
-1
-2
-3
-4
X Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)

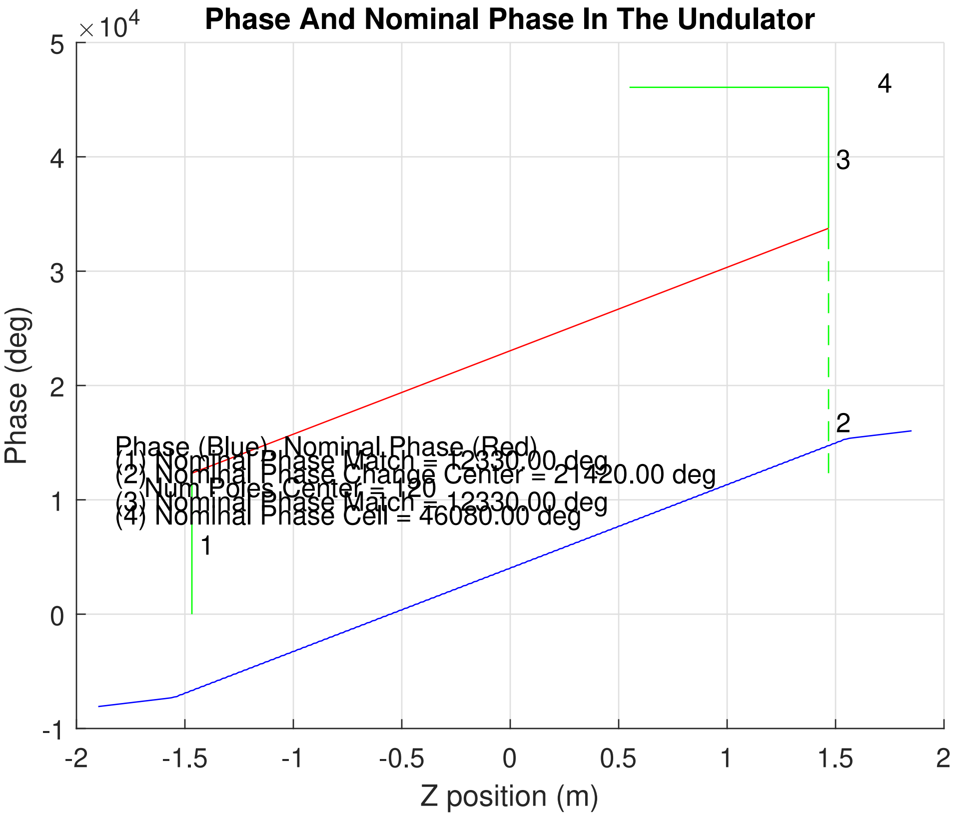
Y Trajectory, Exit Position Corrected
×10^-7
16
14
12
10
8
6
4
2
0
-2
-4
Y Trajectory, Corrected (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)

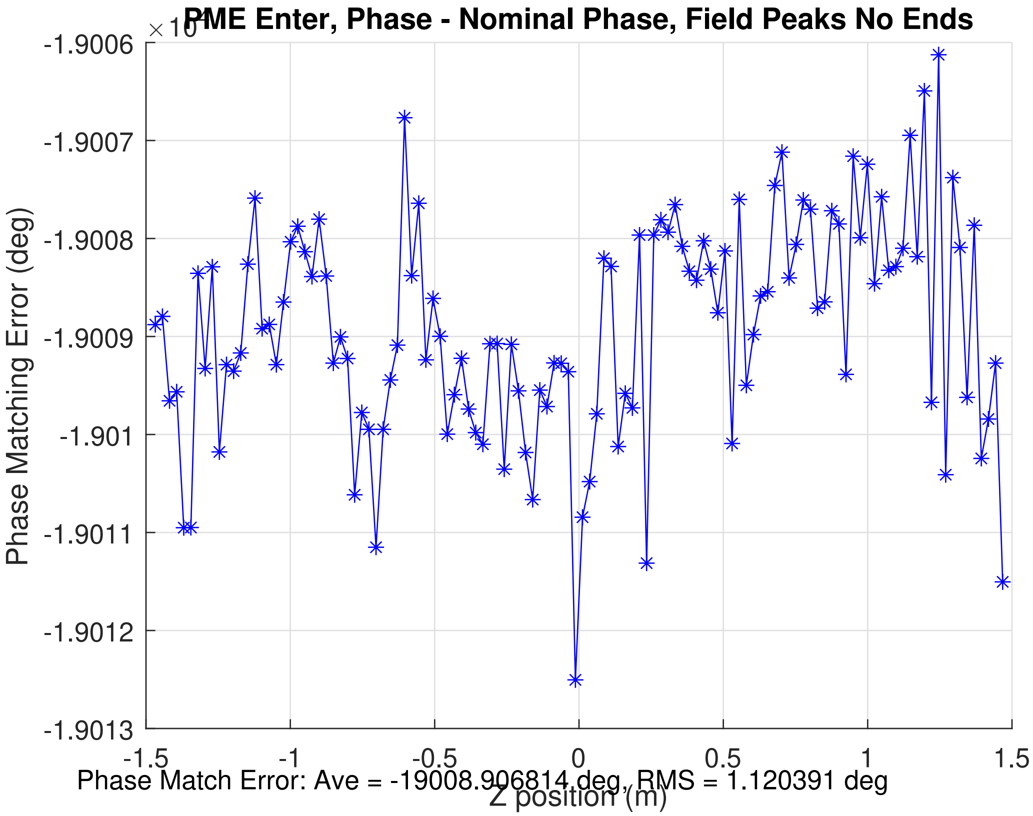

Slippage
×10^-8
9
8
7
6
5
4
3
2
1
0
Slippage (m)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)
Slippage
Fit


Phase Relative To Cell Entrance
Phase (rad)
300
250
200
150
100
50
0
-50
-100
-150
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z (m)



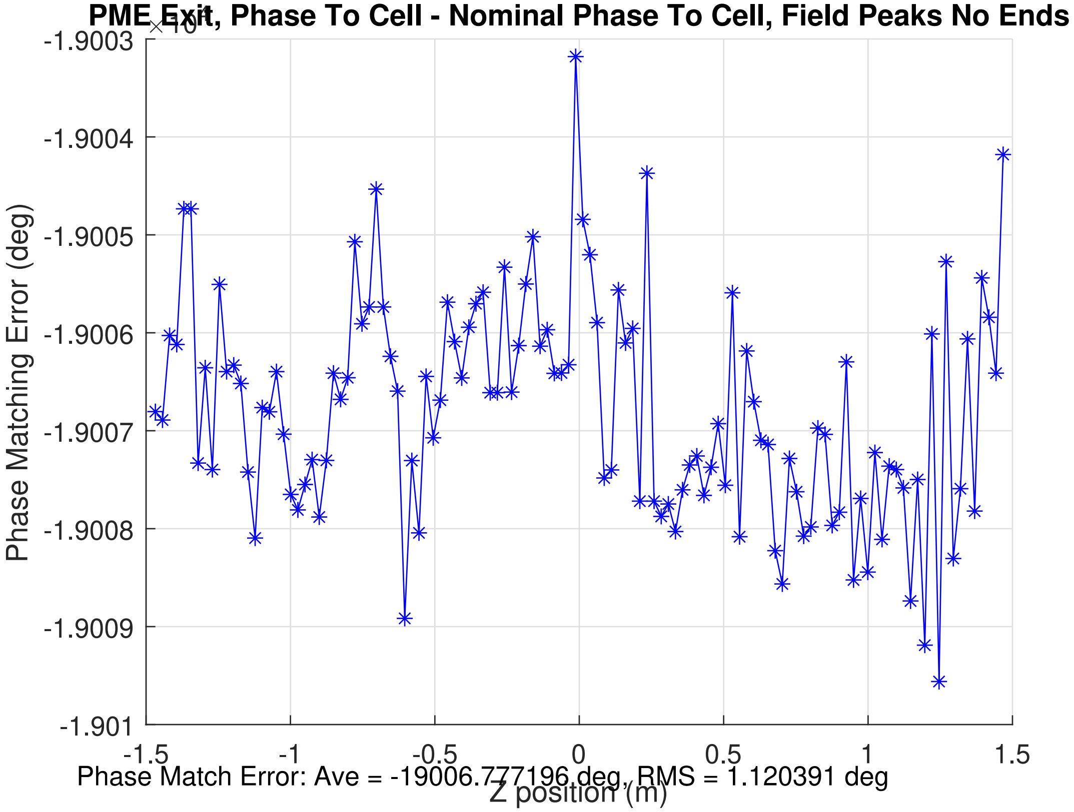
Phase Error: Ave = -0.000000 deg, RMS = 0.853309 deg

Phase And Nominal Phase In The Undulator
×10^4
5
4
3
2
1
0
-1
Phase (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)
Phase (Blue), Nominal Phase (Red)
(1) Nominal Phase Match = 12330.00 deg
(2) Nominal Phase Change Center = 21420.00 deg
Num Poles Center = 120
(3) Nominal Phase Match = 12330.00 deg
(4) Nominal Phase Cell = 46080.00 deg
1
2
3
4

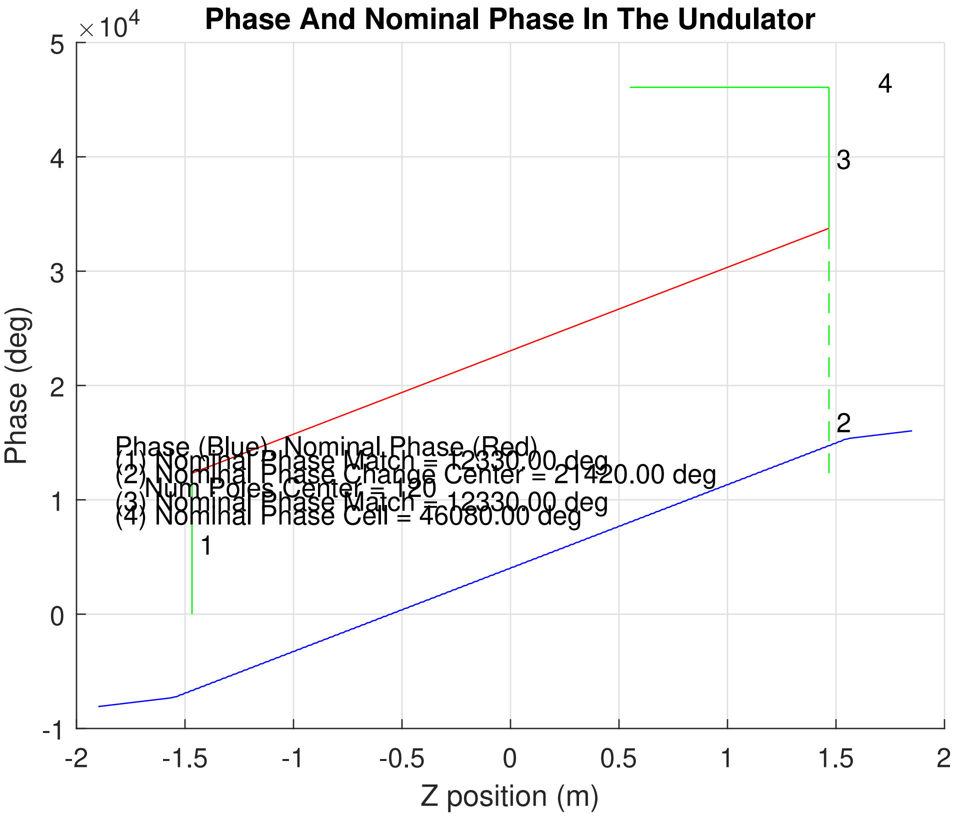


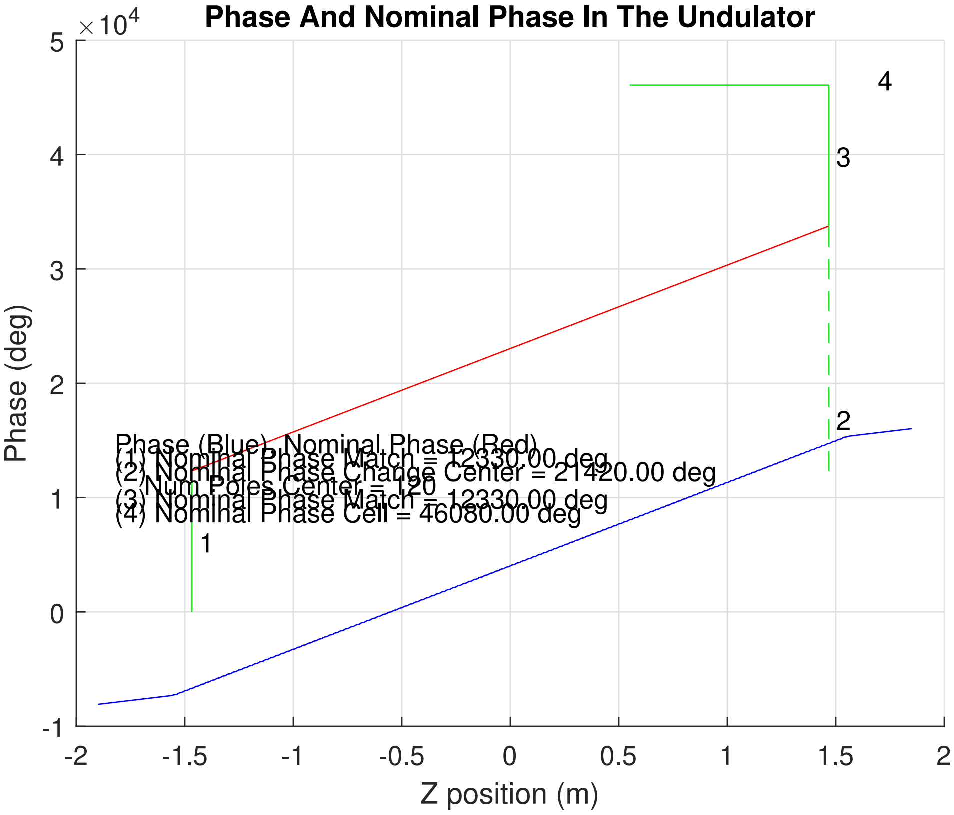
Phase Match Error: Ave = -19008.906814 deg, RMS = 1.120391 deg

PME Exit, Phase To Cell - Nominal Phase To Cell, Field Peaks No Ends



Phase Match Error: Ave = -19006.777196 deg, RMS = 1.120391 deg


Phase And Nominal Phase In The Undulator
×10^4
5
4
3
2
1
0
-1
Phase (deg)
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Z position (m)
1
2
3
4
Phase (Blue), Nominal Phase (Red)
(1) Nominal Phase Match = 12330.00 deg
(2) Nominal Phase Change Center = 21420.00 deg
Num Poles Center = 120
(3) Nominal Phase Match = 12330.00 deg
(4) Nominal Phase Cell = 46080.00 deg


Phase And Nominal Phase In The Undulator
×10^4
5
4
3
2
1
0
-1
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Phase (deg)
Z position (m)
Phase (Blue), Nominal Phase (Red)
(1) Nominal Phase Match = 12330.00 deg
(2) Nominal Phase Change Center = 21420.00 deg
Num Poles Center = 120
(3) Nominal Phase Match = 12330.00 deg
(4) Nominal Phase Cell = 46080.00 deg
1
2
3
4