Testing of the Helicity board

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Data:

1. prexinj_14043.000.root -> Default 30 Hz (Quartet and 8 windows delay), IA scan: 51300, 56300, 46300, 41300, 61300, 51300
2. prexinj_14054.000.root -> Default 30 Hz (Quartet and 8 windows delay), IA scan: 51300, 41300, 61300, 51300

[Path=/chafs2/work1/parity/japanOutput/...]

List of Run

Checking Helicity Board New Settings with Beam

Lognumber 4238486. Submitted by suleiman on Thu, 01/11/2024 - 10:26.

Last updated on Thu, 01/11/2024 - 11:03

Logbooks:	POLOG ELOG
Entry Makers:	suleiman, asen, pking

We will use Hall C beam at 10 uA to FC1 - see Figure 1. Initial settings are in Figures 2 and 3.

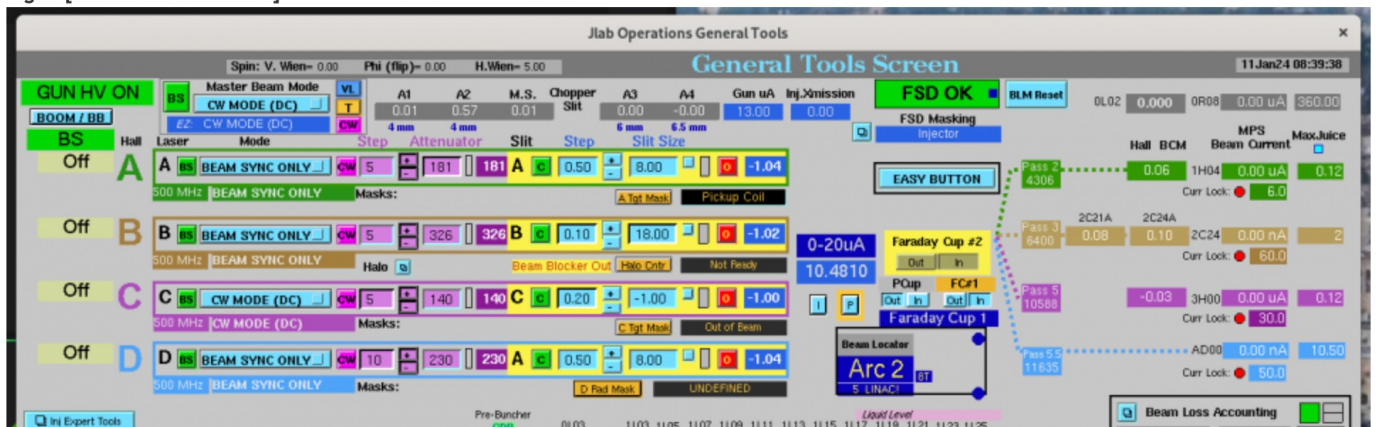
1. Parity Run: 14043 - Default 30 Hz (Quartet and 8 windows delay), IA scan: 51300, 56300, 46300, 41300, 61300, 51300.
2. Parity Run: 14044 - Default 30 Hz (Quartet and No delay), IA scan: 51300, 41300, 61300, 51300.
3. Parity Run: 14045 - Default 30 Hz (Quartet and No delay), No beam, then bean on, pedestal run.
4. Parity Run: 14046 - 240 Hz, 100 us, 4066.67 us (Quartet and 8 windows delay), IA scan: 51300, 41300, 61300, 51300.

Beam is now to FC2:

5. Parity Run: 14047 - 240 Hz, 100 us, 4066.67 us (Quartet and 8 windows delay), No beam, then bean on, pedestal run.
6. Parity Run: 14048 - 240 Hz, 100 us, 4066.67 us (Quartet and 8 windows delay), IA scan: 51300, 41300, 61300, 51300.
7. Parity Run: 14049 - 240 Hz, 100 us, 4066.67 us (Quartet and 128 windows delay), IA scan: 51300, 41300, 61300, 51300.
8. Parity Run: 14050 - 240 Hz, 100 us, 4066.67 us (Thue-Morse-64 and 128 windows delay), IA scan: 51300, 41300, 61300, 51300.
9. Parity Run: 14051 - 240 Hz, 100 us, 4066.67 us (16-Quad and 128 windows delay), IA scan: 51300, 41300, 61300, 51300.
10. Parity Run: 14052 - 240 Hz, 100 us, 4066.67 us (32-Pair and 128 windows delay), IA scan: 51300, 41300, 61300, 51300.
10. Parity Run: 14053 - 240 Hz, 100 us, 4066.67 us (Thue-Morse-64 and No Delay), IA scan: 51300, 41300, 61300, 51300.
11. Parity Run: 14054 - Default 30 Hz (Quartet and 8 windows delay), IA scan: 51300, 41300, 61300, 51300.
12. Parity Run: 14055 - Default 30 Hz (Quartet and No Delay), IA scan: 51300, 41300, 61300, 51300.

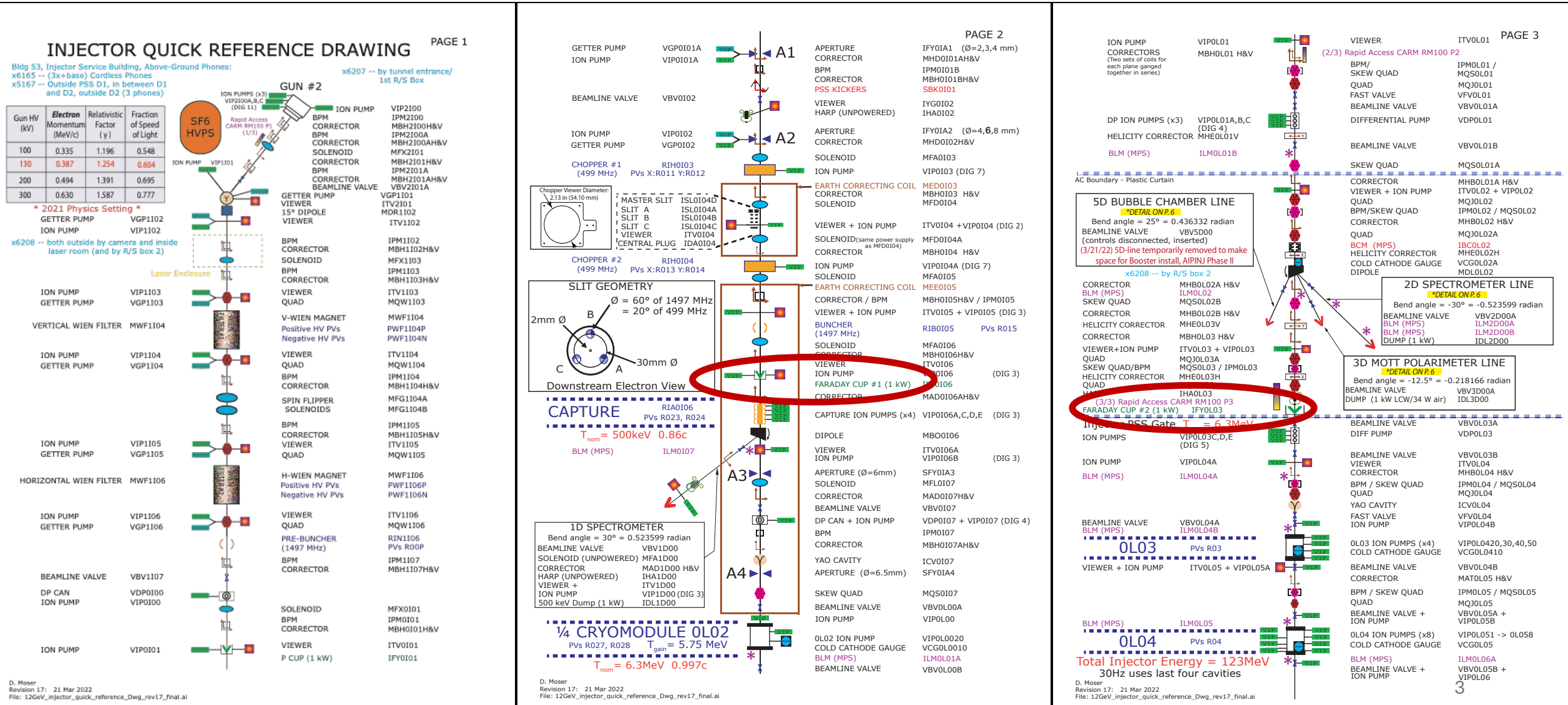
Restored settings back to nominal (30 Hz default and IA=51300).

Fig. 1 [01/11/2024 08:39:38]



Injector layout

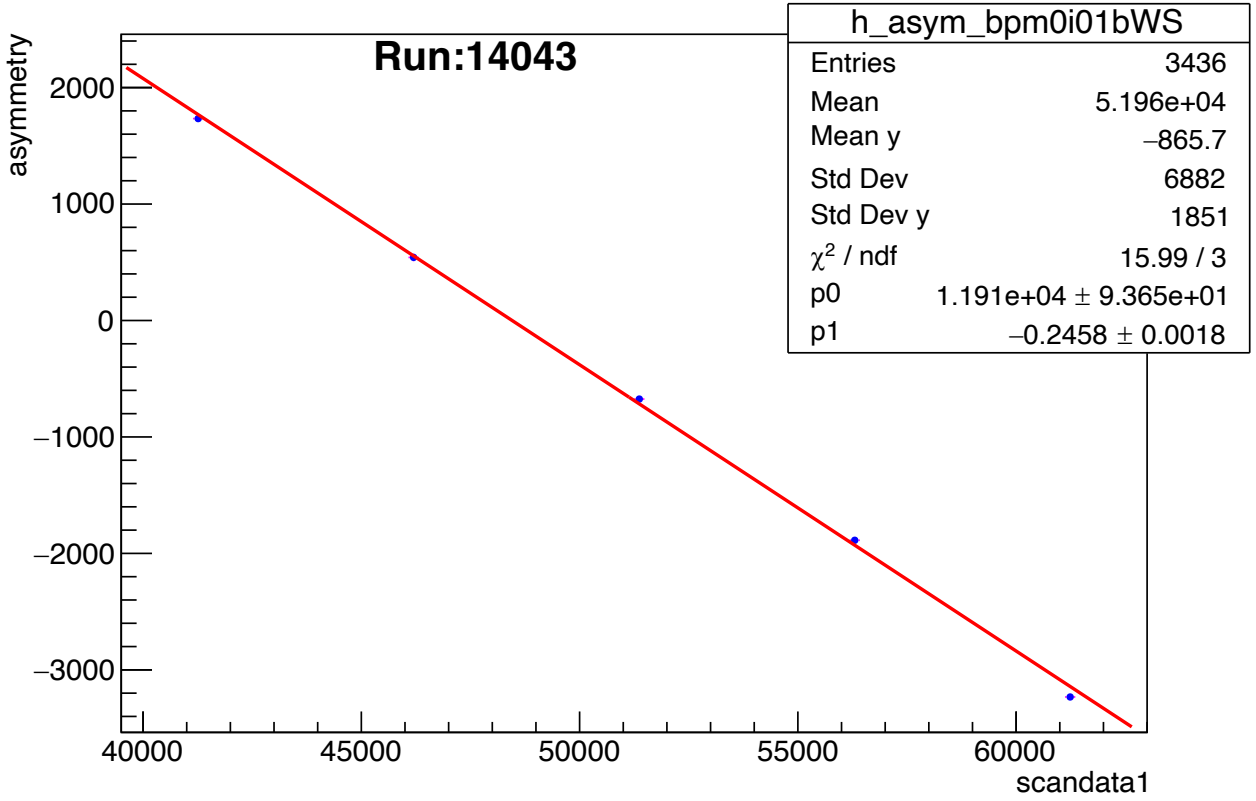
https://wiki.jlab.org/ciswiki/images/4/49/12GeV_injector_quick_reference_rev17_final.pdf

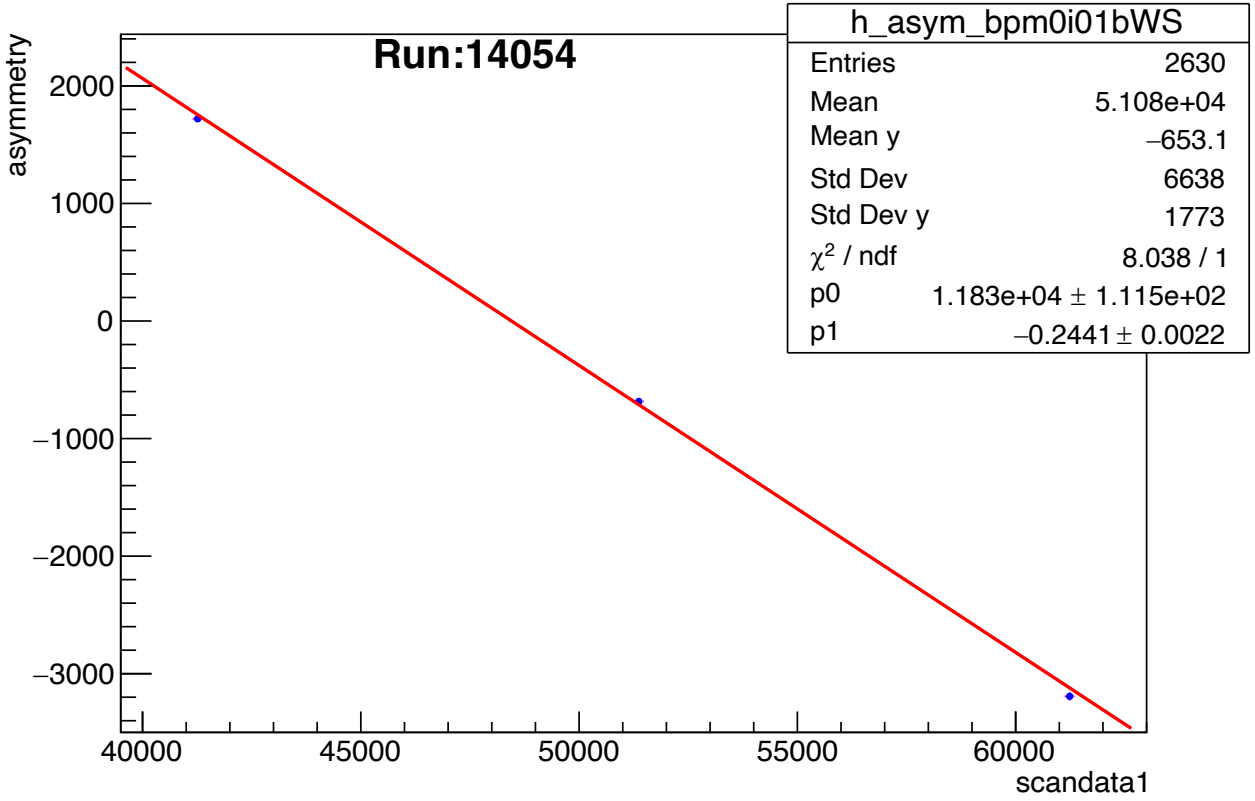


Parameters

- Asymmetry
- Difference in X positions
- Difference in Y positions

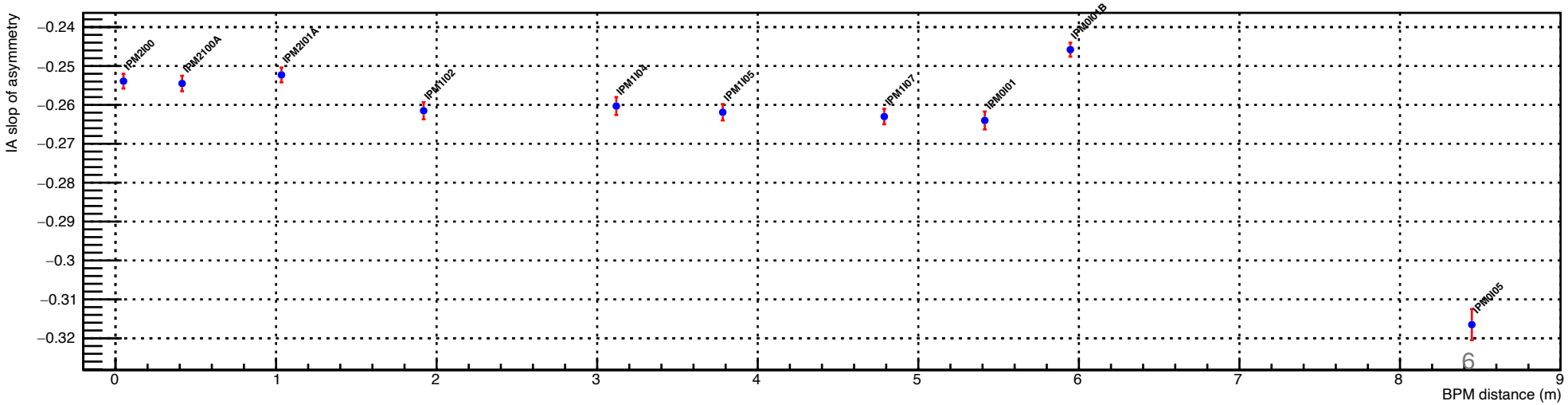
Results


Run:14043
h_asym_bpm0i01bWS
Entries 3436
Mean 5.196e+04
Mean y −865.7
Std Dev 6882
Std Dev y 1851
χ² / ndf 15.99 / 3
p0 1.191e+04 ± 9.365e+01
p1 −0.2458 ± 0.0018
asymmetry
2000
1000
0
−1000
−2000
−3000
40000
45000
50000
55000
60000
scandata1


Run:14054
h_asym_bpm0i01bWS
Entries 2630
Mean 5.108e+04
Mean y −653.1
Std Dev 6638
Std Dev y 1773
χ² / ndf 8.038 / 1
p0 1.183e+04 ± 1.115e+02
p1 −0.2441 ± 0.0022
asymmetry
2000
1000
0
−1000
−2000
−3000
40000
45000
50000
55000
60000
scandata1

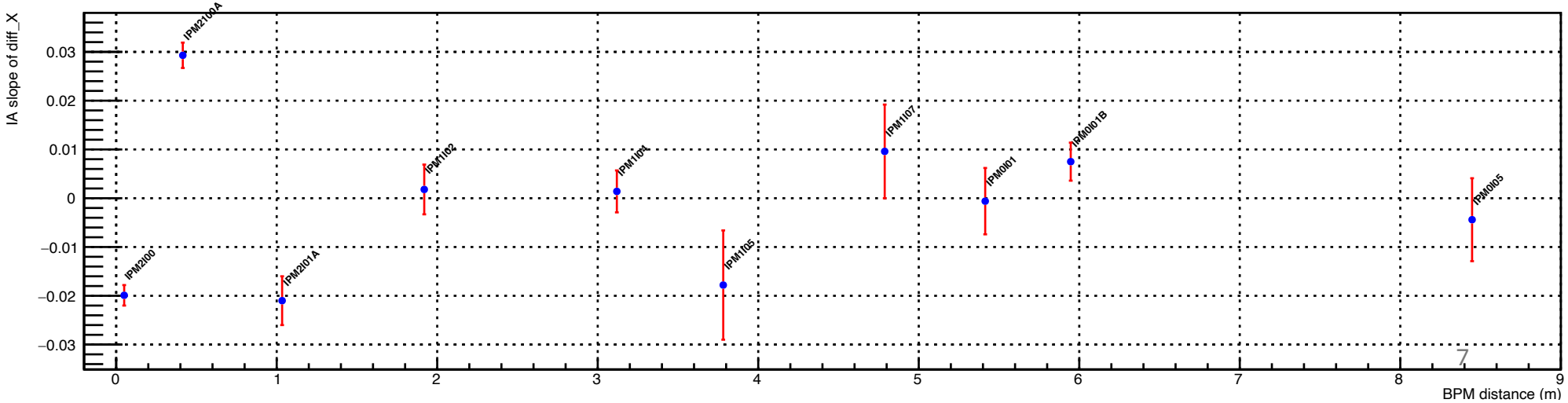
Asymmetry IA slope

Sl no	Variable name	14043 Slope	14043 Slope Error	14054 Slope	14054 Slope Error
1	asym_bpm2i00WS	-0.2539	0.0019	-0.2507	0.0023
2	asym_bpm2i00aWS	-0.2545	0.0020	-0.2513	0.0025
3	asym_bpm2i01aWS	-0.2523	0.0019	-0.2485	0.0023
4	asym_bpm1i02WS	-0.2615	0.0022	-0.2570	0.0026
5	asym_bpm1i04WS	-0.2603	0.0023	-0.2579	0.0028
6	asym_bpm1i05WS	-0.2619	0.0021	-0.2577	0.0025
7	asym_bpm1i07WS	-0.2630	0.0020	-0.2598	0.0025
8	asym_bpm0i01WS	-0.2640	0.0023	-0.2635	0.0029
9	asym_bpm0i01bWS	-0.2458	0.0018	-0.2441	0.0022
10	asym_bpm0i05WS	-0.3165	0.0040	-0.3167	0.0045



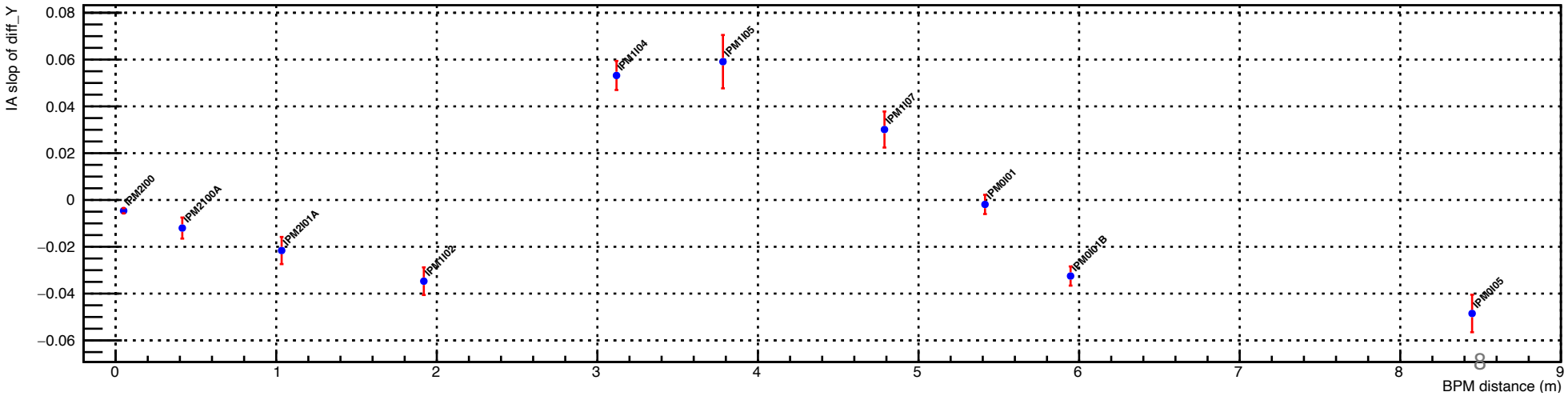
Diff X pos IA slope

Sl no	Variable name	14043 Slope	14043 Slope Error	14054 Slope	14054 Slope Error
1	diff_bpm2i00X	-0.0199	0.0021	-0.0177	0.0023
2	diff_bpm2i00aX	0.0293	0.0026	0.0295	0.0030
3	diff_bpm2i01aX	-0.0210	0.0050	-0.0139	0.0061
4	diff_bpm1i02X	0.0018	0.0051	0.0007	0.0059
5	diff_bpm1i04X	0.0014	0.0043	-0.0016	0.0049
6	diff_bpm1i05X	-0.0178	0.0112	-0.0037	0.0134
7	diff_bpm1i07X	0.0096	0.0096	0.0183	0.0110
8	diff_bpm0i01X	-0.0006	0.0068	0.0086	0.0077
9	diff_bpm0i01bX	0.0075	0.0039	0.0099	0.0045
10	diff_bpm0i05X	-0.0044	0.0085	0.0127	0.0098

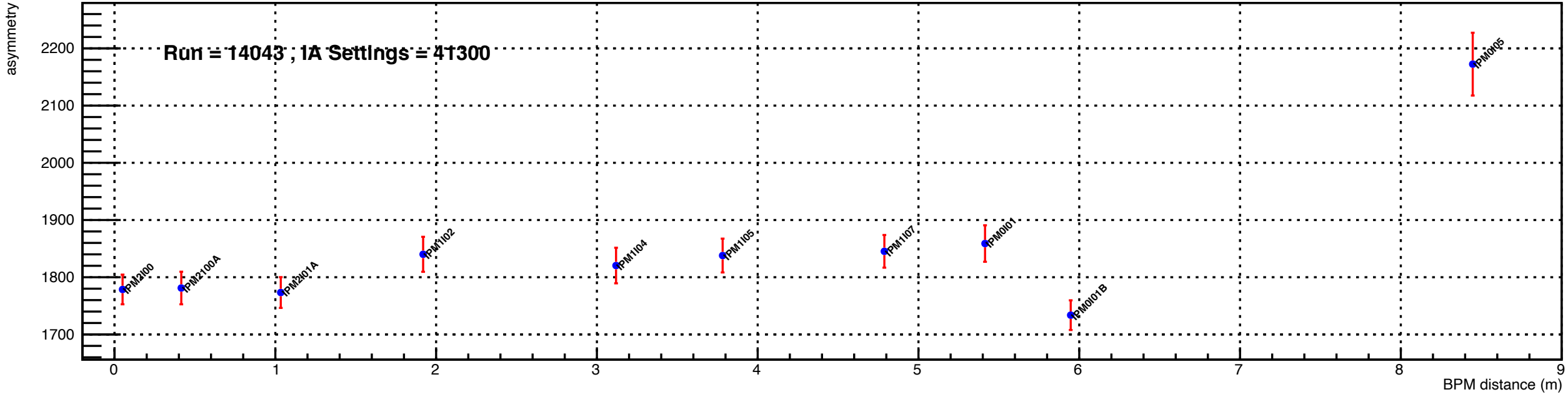


Diff Y pos IA slope

Sl no	Variable name	14043 Slope	14043 Slope Error	14054 Slope	14054 Slope Error
1	diff_bpm2i00Y	-0.0046	0.0011	-0.0062	0.0013
2	diff_bpm2i00aY	-0.0120	0.0045	-0.0038	0.0056
3	diff_bpm2i01aY	-0.0216	0.0058	-0.0110	0.0070
4	diff_bpm1i02Y	-0.0347	0.0059	-0.0280	0.0069
5	diff_bpm1i04Y	0.0532	0.0062	0.0389	0.0079
6	diff_bpm1i05Y	0.0591	0.0114	0.0499	0.0138
7	diff_bpm1i07Y	0.0301	0.0077	0.0335	0.0091
8	diff_bpm0i01Y	-0.0019	0.0041	0.0010	0.0048
9	diff_bpm0i01bY	-0.0325	0.0041	-0.0300	0.0048
10	diff_bpm0i05Y	-0.0485	0.0080	-0.0444	0.0098



Asymmetry

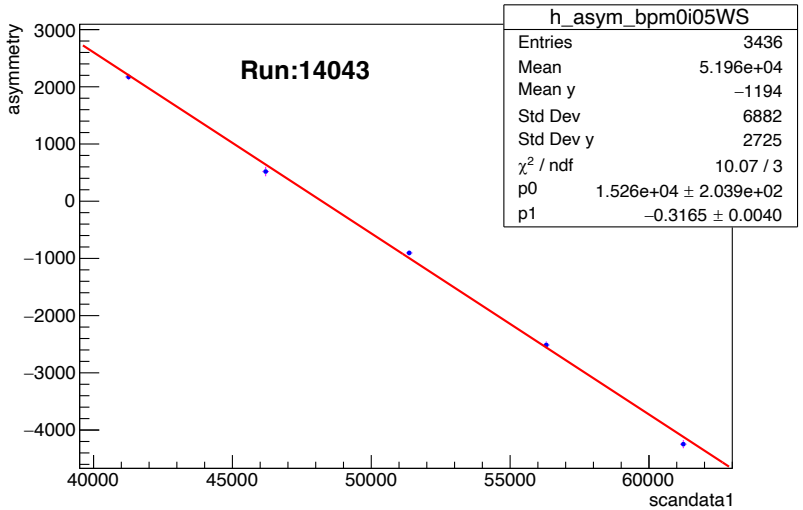

Run = 14043 , 1A Settings = 41300
asymmetry
2200
2100
2000
1900
1800
1700
0
1
2
3
4
5
6
7
8
9
BPM distance (m)
IPM2I00
IPM2100A
IPM2I01A
IPM1I02
IPM1I04
IPM1I05
IPM1I07
IPM0I01
IPM0I01B
IPM0I05

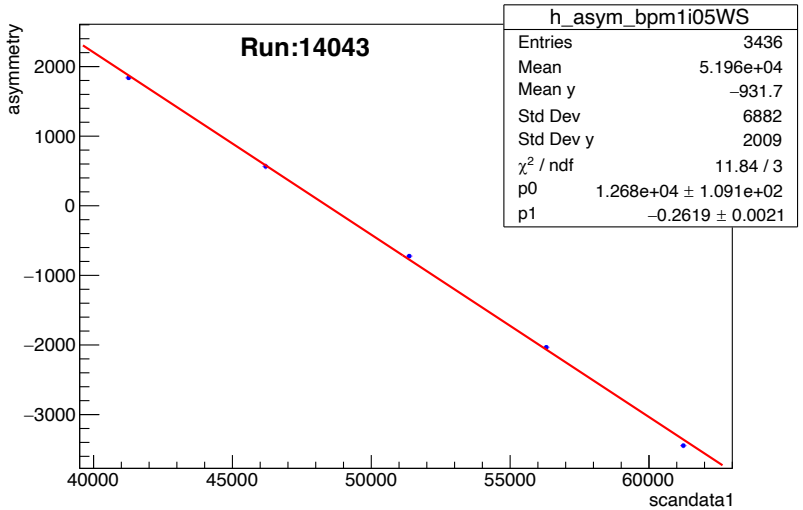
Summary

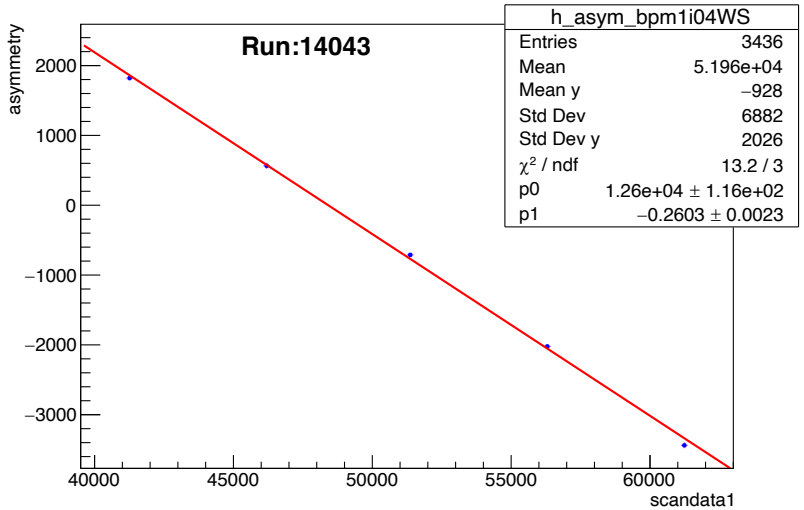
- Analysis is done up to Faraday Cup 1.
- **IPM1I03** is not connected.
- Asymmetry slopes are consistent for both the runs.
- A small deflection in asymmetry is observed in the **IPM0I05**. May be due to A2 and Chopper .

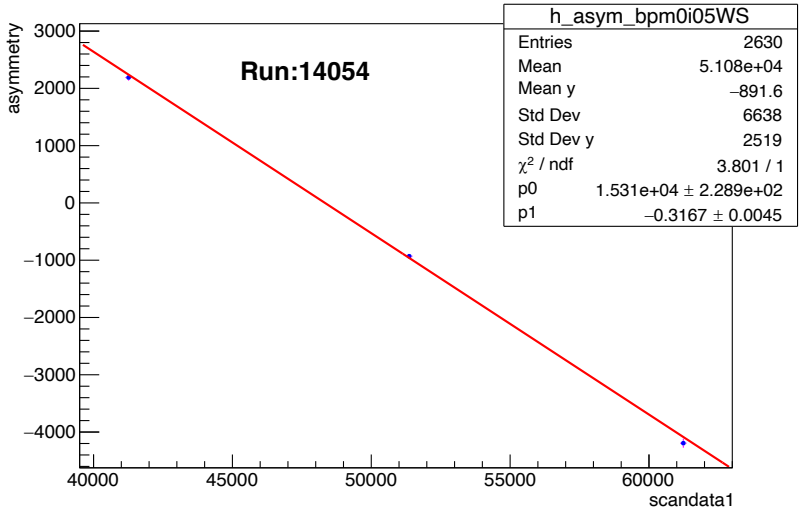
Backup

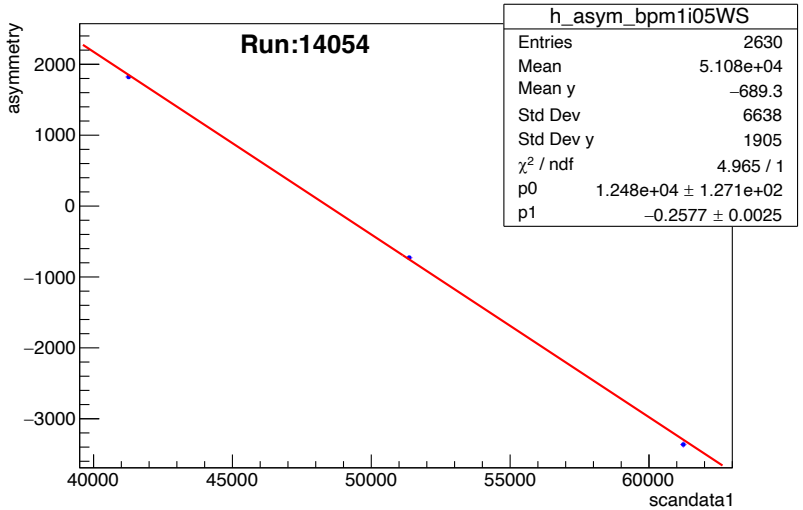
Result

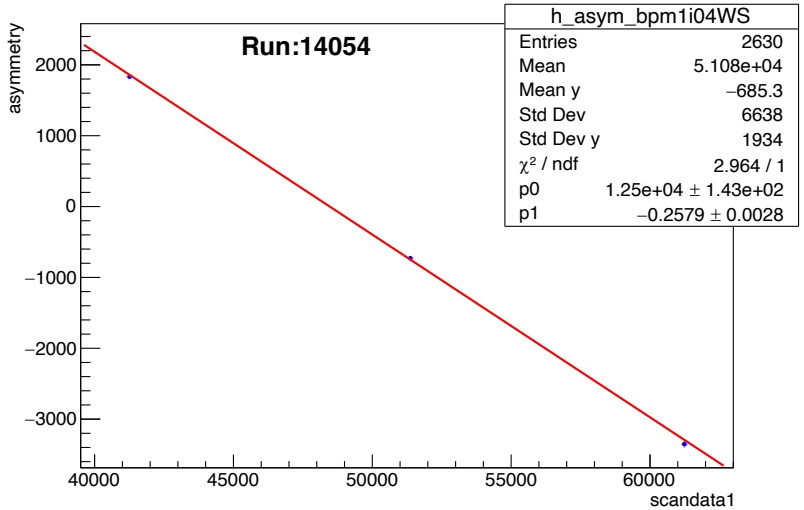

Run:14043
h_asym_bpm0i05WS
Entries 3436
Mean 5.196e+04
Mean y −1194
Std Dev 6882
Std Dev y 2725
χ² / ndf 10.07 / 3
p0 1.526e+04 ± 2.039e+02
p1 −0.3165 ± 0.0040
asymmetry
scandata1


Run:14043
h_asym_bpm1i05WS
Entries 3436
Mean 5.196e+04
Mean y −931.7
Std Dev 6882
Std Dev y 2009
χ² / ndf 11.84 / 3
p0 1.268e+04 ± 1.091e+02
p1 −0.2619 ± 0.0021
asymmetry
scandata1

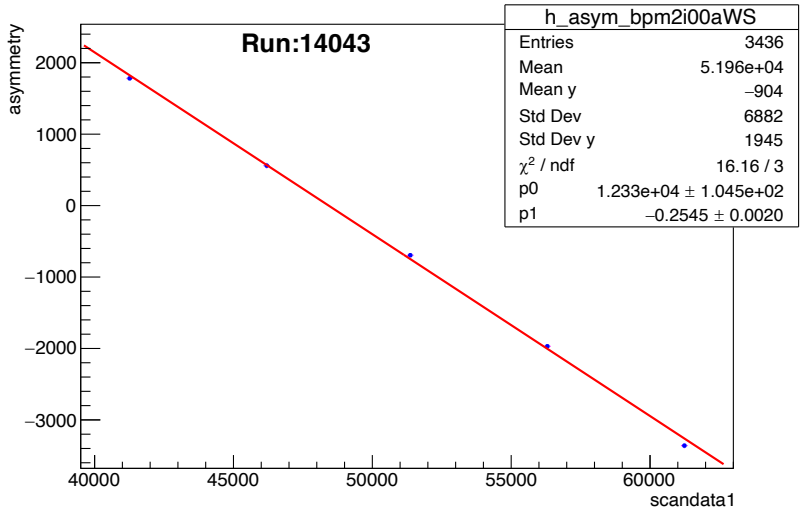

Run:14043
h_asym_bpm1i04WS
Entries 3436
Mean 5.196e+04
Mean y −928
Std Dev 6882
Std Dev y 2026
χ² / ndf 13.2 / 3
p0 1.26e+04 ± 1.16e+02
p1 −0.2603 ± 0.0023
asymmetry
scandata1

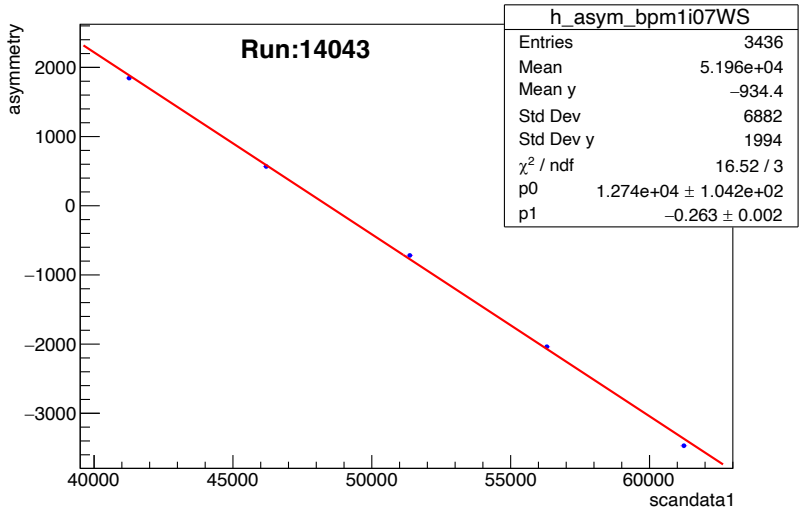

Run:14054
h_asym_bpm0i05WS
Entries 2630
Mean 5.108e+04
Mean y −891.6
Std Dev 6638
Std Dev y 2519
χ² / ndf 3.801 / 1
p0 1.531e+04 ± 2.289e+02
p1 −0.3167 ± 0.0045
asymmetry
scandata1

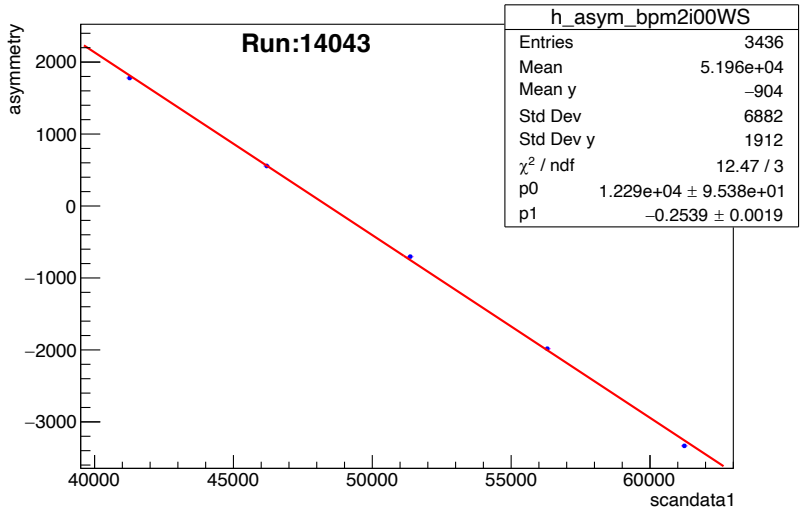

Run:14054
h_asym_bpm1i05WS
Entries 2630
Mean 5.108e+04
Mean y −689.3
Std Dev 6638
Std Dev y 1905
χ² / ndf 4.965 / 1
p0 1.248e+04 ± 1.271e+02
p1 −0.2577 ± 0.0025
asymmetry
scandata1

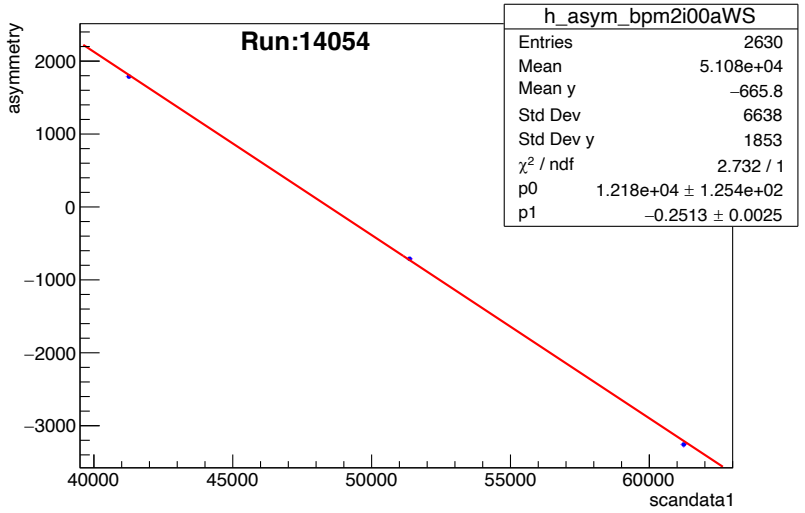

Run:14054
h_asym_bpm1i04WS
Entries 2630
Mean 5.108e+04
Mean y −685.3
Std Dev 6638
Std Dev y 1934
χ² / ndf 2.964 / 1
p0 1.25e+04 ± 1.43e+02
p1 −0.2579 ± 0.0028
asymmetry
scandata1

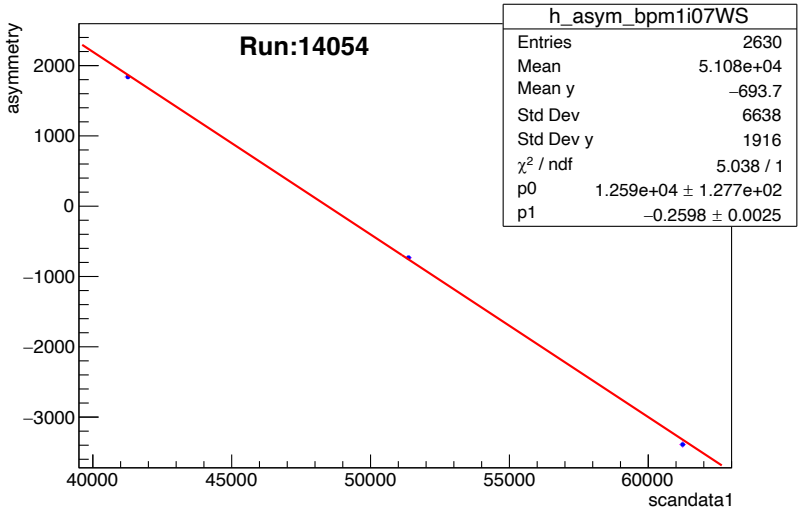
Result

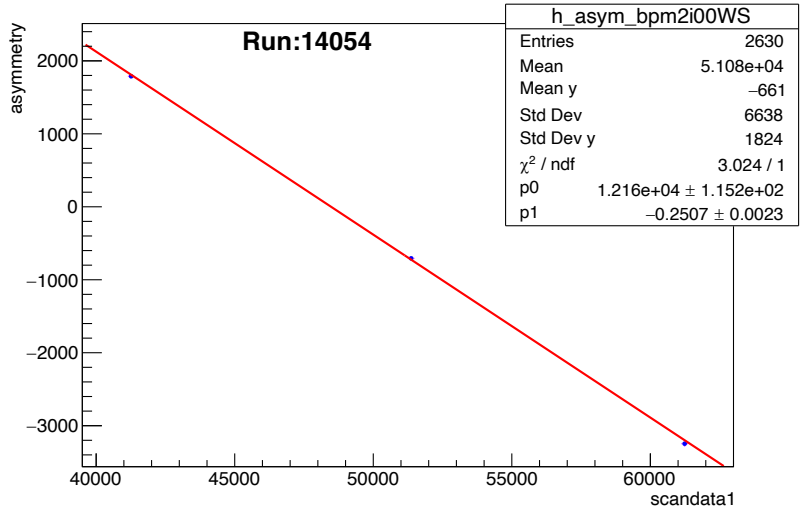

Run:14043
h_asym_bpm2i00aWS
Entries 3436
Mean 5.196e+04
Mean y −904
Std Dev 6882
Std Dev y 1945
χ² / ndf 16.16 / 3
p0 1.233e+04 ± 1.045e+02
p1 −0.2545 ± 0.0020
asymmetry
scandata1


Run:14043
h_asym_bpm1i07WS
Entries 3436
Mean 5.196e+04
Mean y −934.4
Std Dev 6882
Std Dev y 1994
χ² / ndf 16.52 / 3
p0 1.274e+04 ± 1.042e+02
p1 −0.263 ± 0.002
asymmetry
scandata1


Run:14043
h_asym_bpm2i00WS
Entries 3436
Mean 5.196e+04
Mean y −904
Std Dev 6882
Std Dev y 1912
χ² / ndf 12.47 / 3
p0 1.229e+04 ± 9.538e+01
p1 −0.2539 ± 0.0019
asymmetry
scandata1

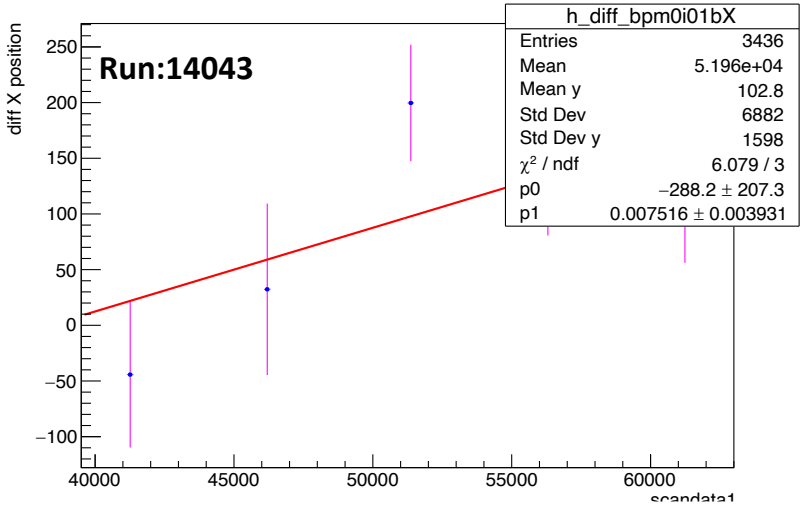

Run:14054
h_asym_bpm2i00aWS
Entries 2630
Mean 5.108e+04
Mean y −665.8
Std Dev 6638
Std Dev y 1853
χ² / ndf 2.732 / 1
p0 1.218e+04 ± 1.254e+02
p1 −0.2513 ± 0.0025
asymmetry
scandata1

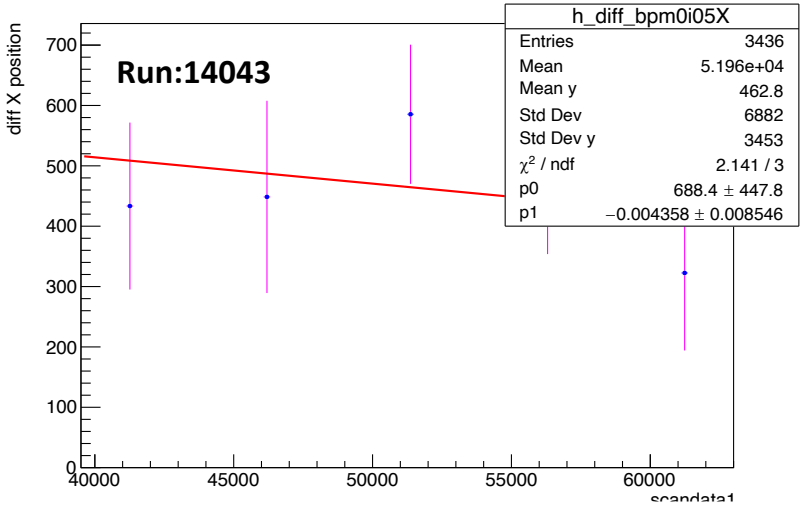

Run:14054
h_asym_bpm1i07WS
Entries 2630
Mean 5.108e+04
Mean y −693.7
Std Dev 6638
Std Dev y 1916
χ² / ndf 5.038 / 1
p0 1.259e+04 ± 1.277e+02
p1 −0.2598 ± 0.0025
asymmetry
scandata1

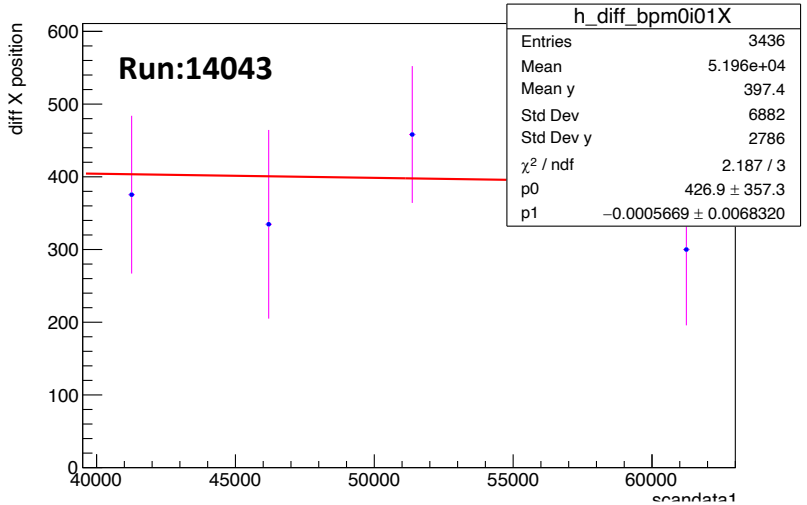

Run:14054
h_asym_bpm2i00WS
Entries 2630
Mean 5.108e+04
Mean y −661
Std Dev 6638
Std Dev y 1824
χ² / ndf 3.024 / 1
p0 1.216e+04 ± 1.152e+02
p1 −0.2507 ± 0.0023
asymmetry
scandata1

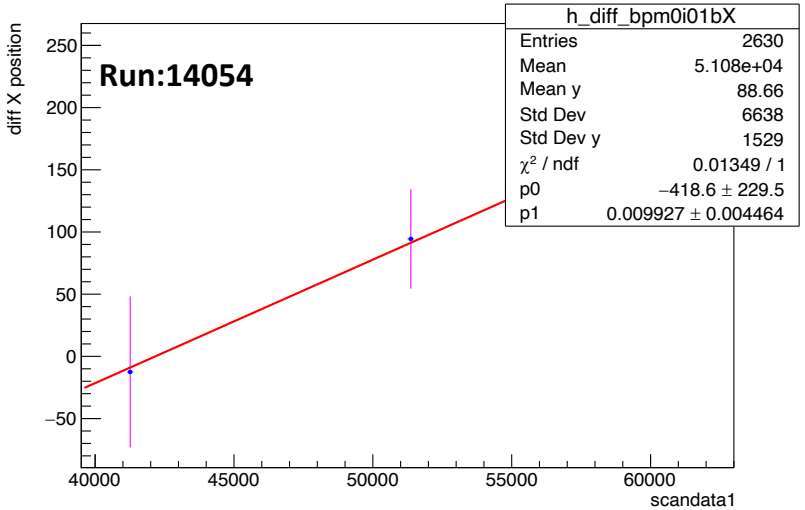
Difference X Positions

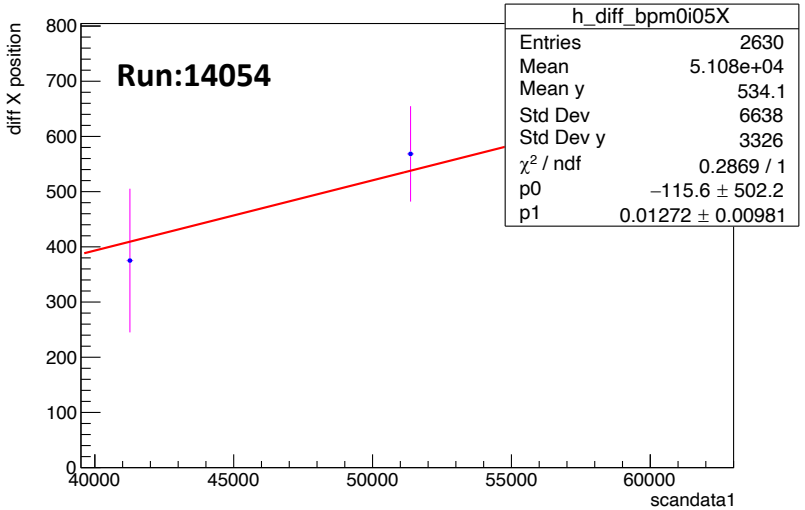
Result

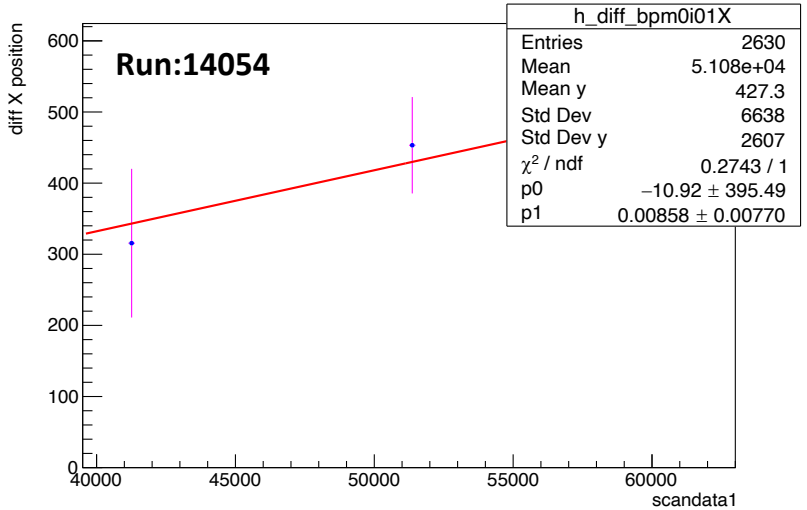

Run:14043
h_diff_bpm0i01bX
Entries 3436
Mean 5.196e+04
Mean y 102.8
Std Dev 6882
Std Dev y 1598
χ² / ndf 6.079 / 3
p0 −288.2 ± 207.3
p1 0.007516 ± 0.003931
diff X position
scandata1


Run:14043
h_diff_bpm0i05X
Entries 3436
Mean 5.196e+04
Mean y 462.8
Std Dev 6882
Std Dev y 3453
χ² / ndf 2.141 / 3
p0 688.4 ± 447.8
p1 −0.004358 ± 0.008546
diff X position
scandata1

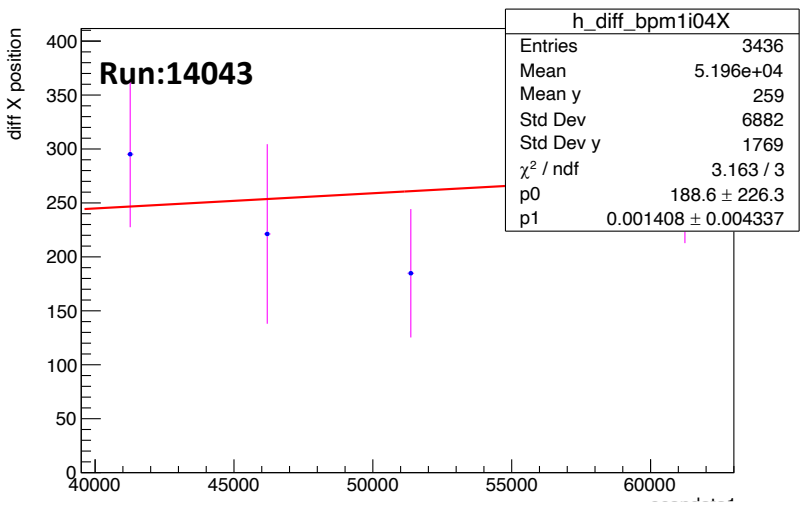

Run:14043
h_diff_bpm0i01X
Entries 3436
Mean 5.196e+04
Mean y 397.4
Std Dev 6882
Std Dev y 2786
χ² / ndf 2.187 / 3
p0 426.9 ± 357.3
p1 −0.0005669 ± 0.0068320
diff X position
scandata1

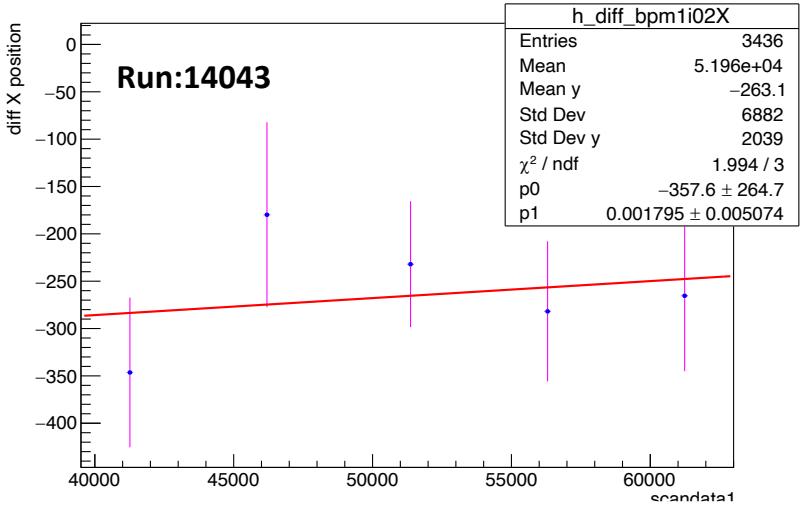

Run:14054
h_diff_bpm0i01bX
Entries 2630
Mean 5.108e+04
Mean y 88.66
Std Dev 6638
Std Dev y 1529
χ² / ndf 0.01349 / 1
p0 −418.6 ± 229.5
p1 0.009927 ± 0.004464
diff X position
scandata1

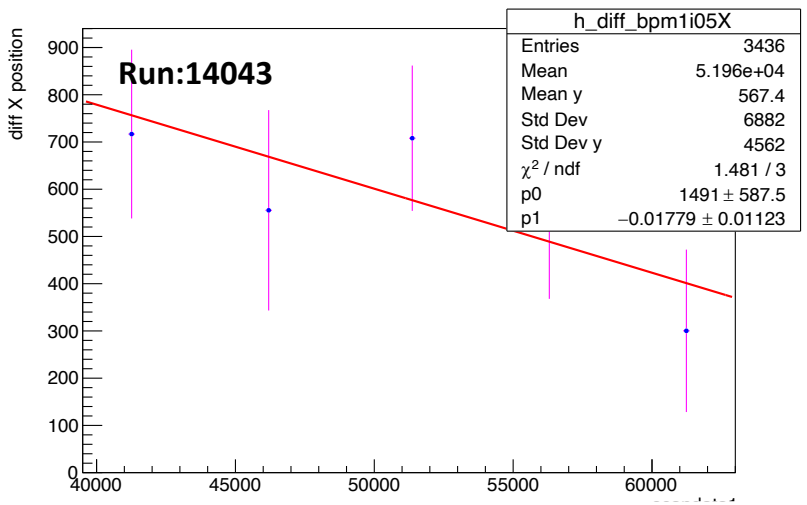

Run:14054
h_diff_bpm0i05X
Entries 2630
Mean 5.108e+04
Mean y 534.1
Std Dev 6638
Std Dev y 3326
χ² / ndf 0.2869 / 1
p0 −115.6 ± 502.2
p1 0.01272 ± 0.00981
diff X position
scandata1

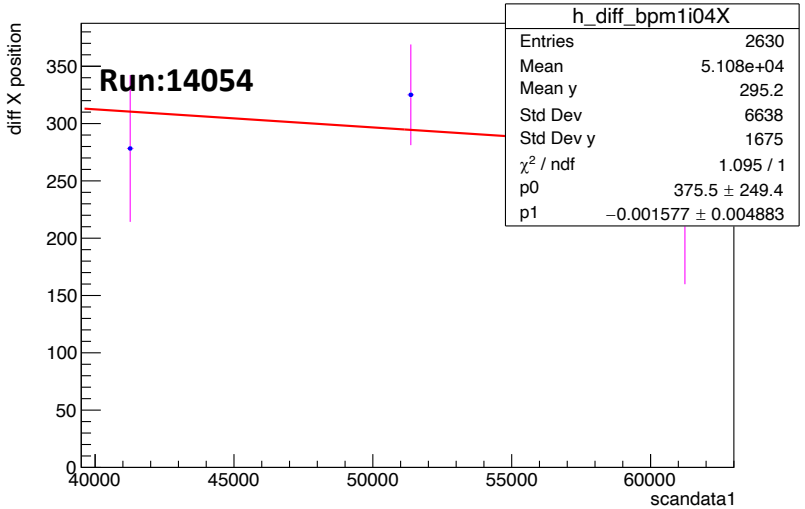

Run:14054
h_diff_bpm0i01X
Entries 2630
Mean 5.108e+04
Mean y 427.3
Std Dev 6638
Std Dev y 2607
χ² / ndf 0.2743 / 1
p0 −10.92 ± 395.49
p1 0.00858 ± 0.00770
diff X position
scandata1

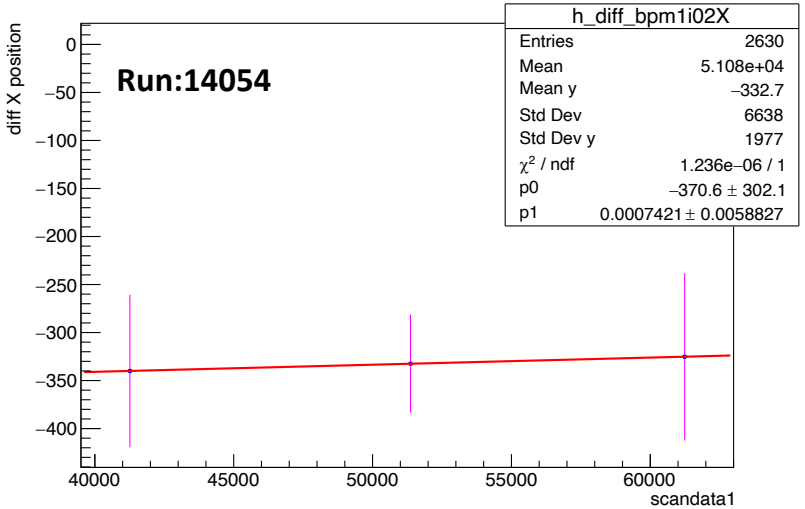
Result

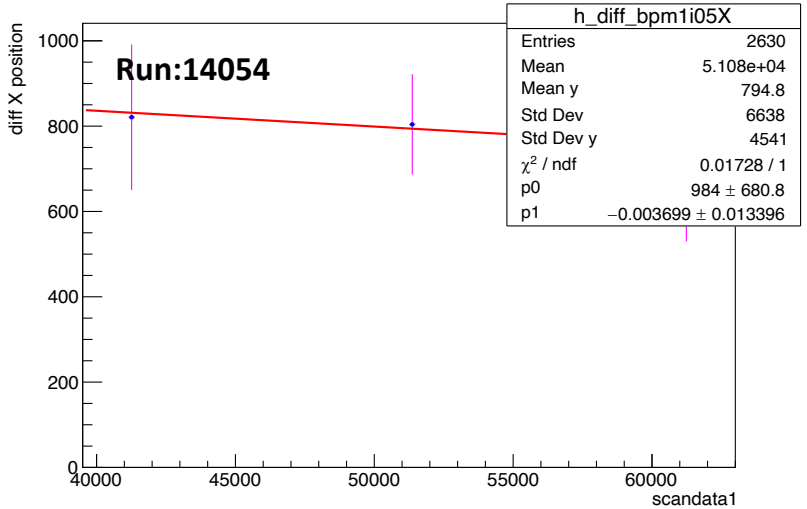

Run:14043
h_diff_bpm1i04X
Entries 3436
Mean 5.196e+04
Mean y 259
Std Dev 6882
Std Dev y 1769
χ² / ndf 3.163 / 3
p0 188.6 ± 226.3
p1 0.001408 ± 0.004337
diff X position


Run:14043
h_diff_bpm1i02X
Entries 3436
Mean 5.196e+04
Mean y −263.1
Std Dev 6882
Std Dev y 2039
χ² / ndf 1.994 / 3
p0 −357.6 ± 264.7
p1 0.001795 ± 0.005074
diff X position
scandata1

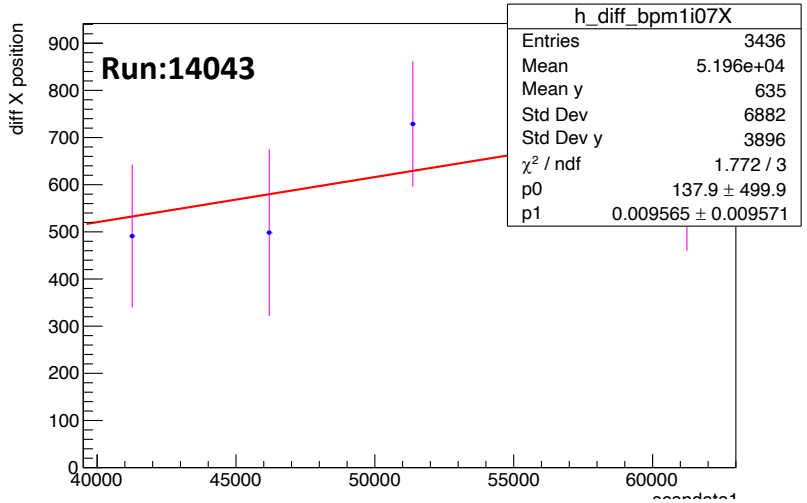

Run:14043
h_diff_bpm1i05X
Entries 3436
Mean 5.196e+04
Mean y 567.4
Std Dev 6882
Std Dev y 4562
χ² / ndf 1.481 / 3
p0 1491 ± 587.5
p1 −0.01779 ± 0.01123
diff X position

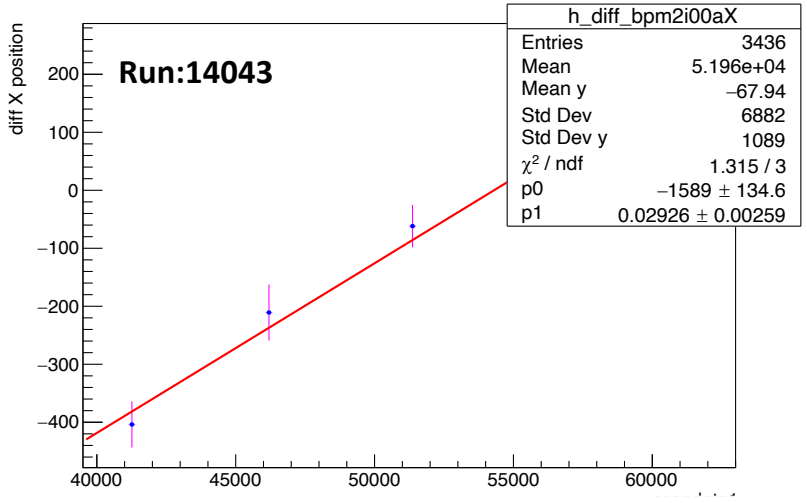

Run:14054
h_diff_bpm1i04X
Entries 2630
Mean 5.108e+04
Mean y 295.2
Std Dev 6638
Std Dev y 1675
χ² / ndf 1.095 / 1
p0 375.5 ± 249.4
p1 −0.001577 ± 0.004883
diff X position
scandata1

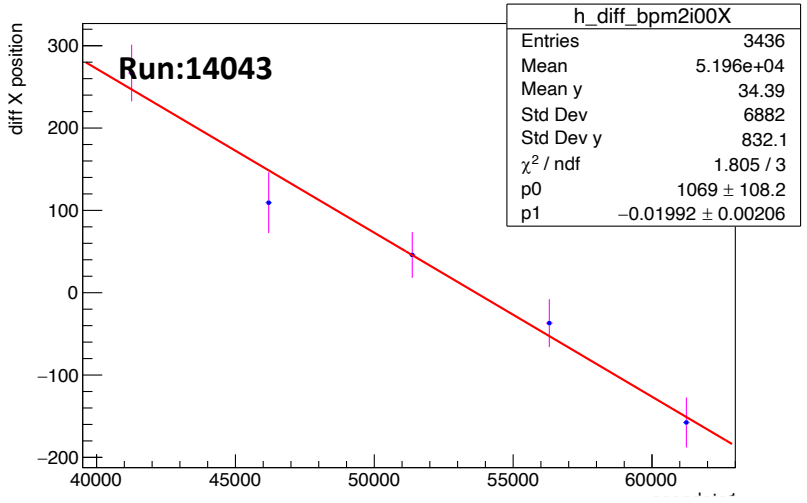

Run:14054
h_diff_bpm1i02X
Entries 2630
Mean 5.108e+04
Mean y −332.7
Std Dev 6638
Std Dev y 1977
χ² / ndf 1.236e−06 / 1
p0 −370.6 ± 302.1
p1 0.0007421 ± 0.0058827
diff X position
scandata1

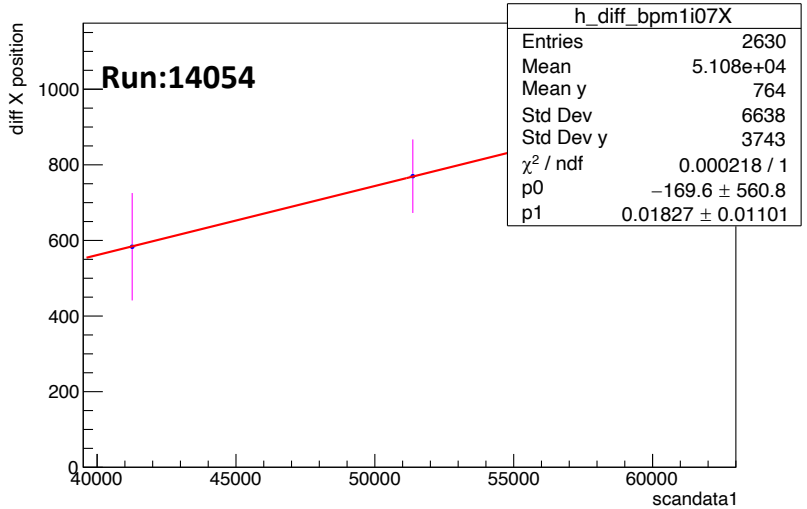

Run:14054
h_diff_bpm1i05X
Entries 2630
Mean 5.108e+04
Mean y 794.8
Std Dev 6638
Std Dev y 4541
χ² / ndf 0.01728 / 1
p0 984 ± 680.8
p1 −0.003699 ± 0.013396
diff X position
scandata1

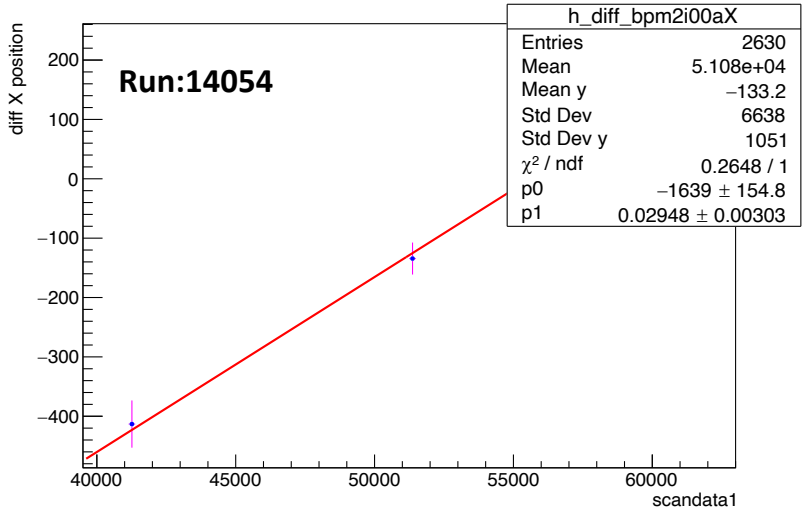
Result

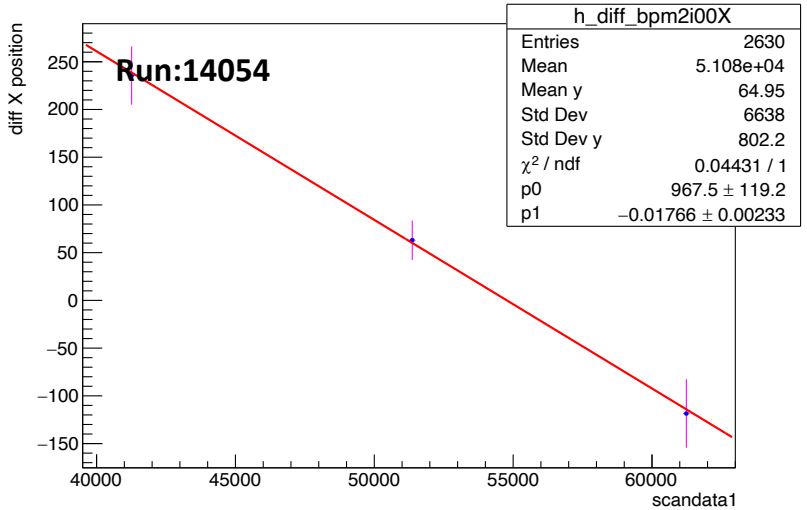

Run:14043
h_diff_bpm1i07X
Entries 3436
Mean 5.196e+04
Mean y 635
Std Dev 6882
Std Dev y 3896
χ² / ndf 1.772 / 3
p0 137.9 ± 499.9
p1 0.009565 ± 0.009571
diff X position


Run:14043
h_diff_bpm2i00aX
Entries 3436
Mean 5.196e+04
Mean y −67.94
Std Dev 6882
Std Dev y 1089
χ² / ndf 1.315 / 3
p0 −1589 ± 134.6
p1 0.02926 ± 0.00259
diff X position


Run:14043
h_diff_bpm2i00X
Entries 3436
Mean 5.196e+04
Mean y 34.39
Std Dev 6882
Std Dev y 832.1
χ² / ndf 1.805 / 3
p0 1069 ± 108.2
p1 −0.01992 ± 0.00206
diff X position

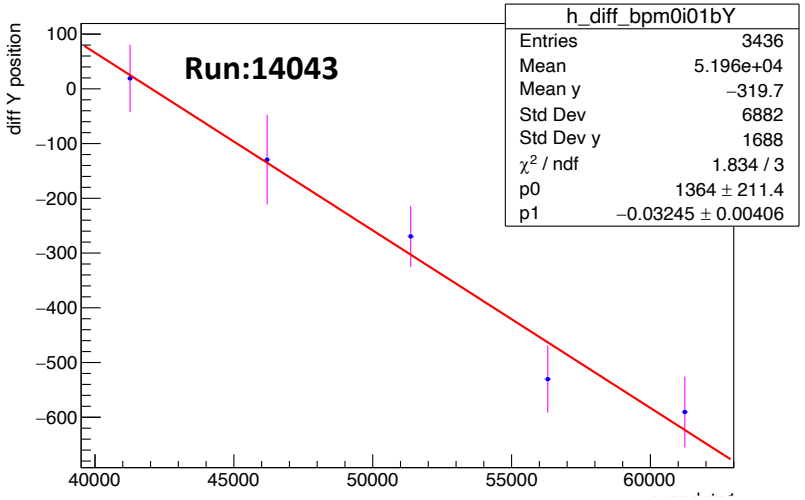

Run:14054
h_diff_bpm1i07X
Entries 2630
Mean 5.108e+04
Mean y 764
Std Dev 6638
Std Dev y 3743
χ² / ndf 0.000218 / 1
p0 −169.6 ± 560.8
p1 0.01827 ± 0.01101
diff X position
scandata1

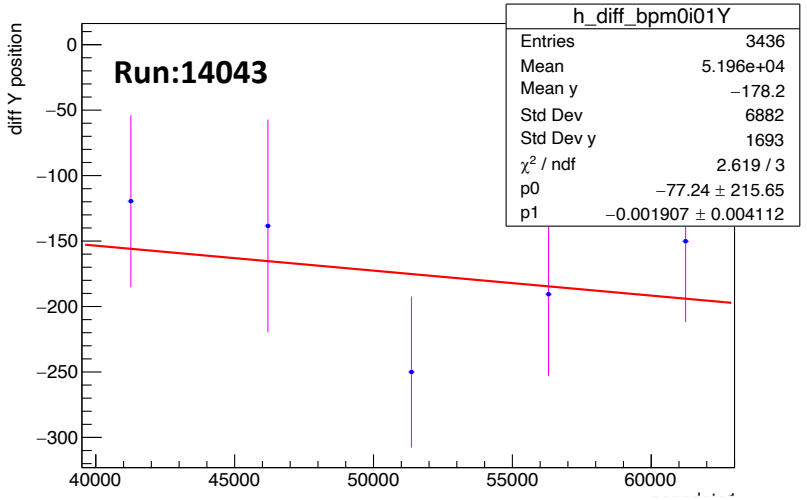

Run:14054
h_diff_bpm2i00aX
Entries 2630
Mean 5.108e+04
Mean y −133.2
Std Dev 6638
Std Dev y 1051
χ² / ndf 0.2648 / 1
p0 −1639 ± 154.8
p1 0.02948 ± 0.00303
diff X position
scandata1

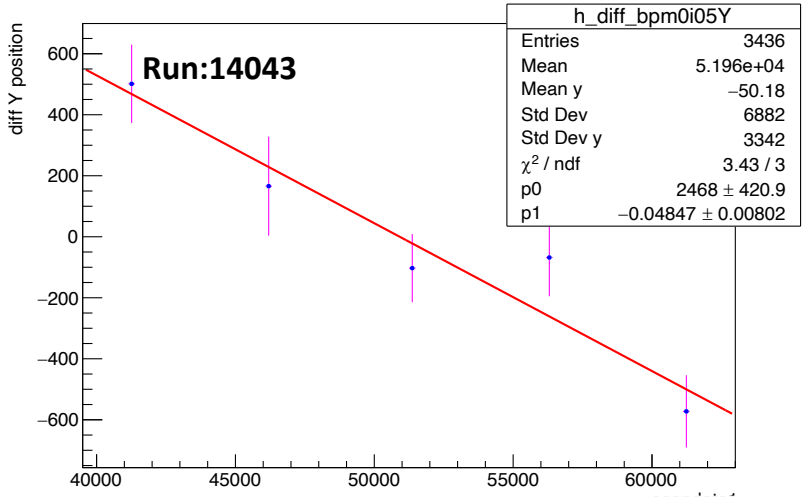

Run:14054
h_diff_bpm2i00X
Entries 2630
Mean 5.108e+04
Mean y 64.95
Std Dev 6638
Std Dev y 802.2
χ² / ndf 0.04431 / 1
p0 967.5 ± 119.2
p1 −0.01766 ± 0.00233
diff X position
scandata1

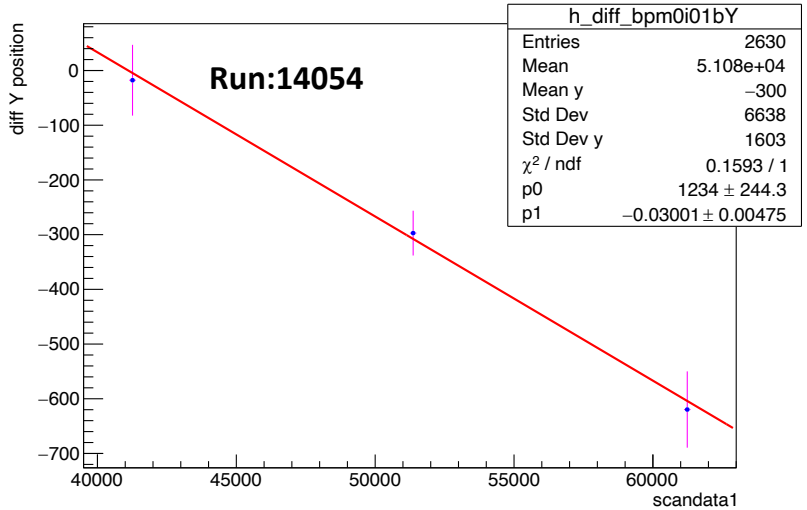
Difference Y Positions

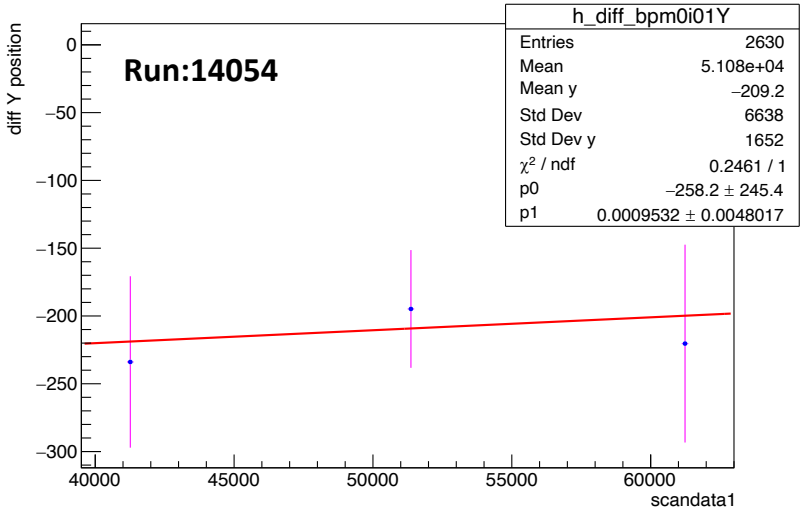
Result

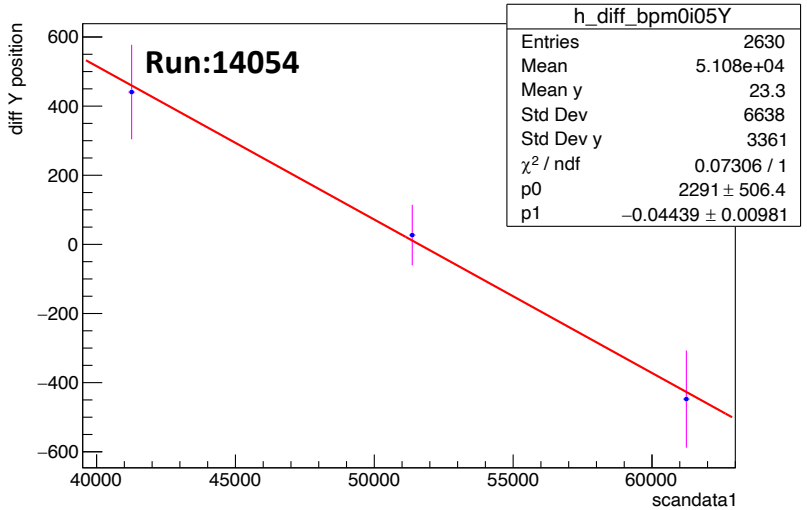

Run:14043
h_diff_bpm0i01bY
Entries 3436
Mean 5.196e+04
Mean y −319.7
Std Dev 6882
Std Dev y 1688
χ² / ndf 1.834 / 3
p0 1364 ± 211.4
p1 −0.03245 ± 0.00406
diff Y position


Run:14043
h_diff_bpm0i01Y
Entries 3436
Mean 5.196e+04
Mean y −178.2
Std Dev 6882
Std Dev y 1693
χ² / ndf 2.619 / 3
p0 −77.24 ± 215.65
p1 −0.001907 ± 0.004112
diff Y position

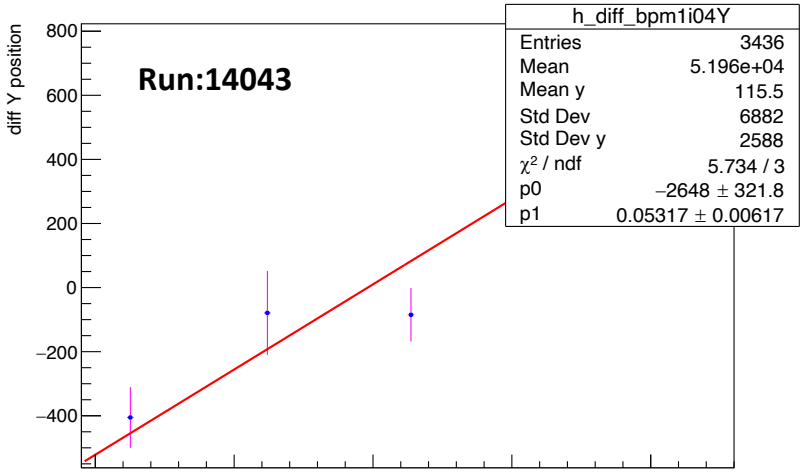

Run:14043
h_diff_bpm0i05Y
Entries 3436
Mean 5.196e+04
Mean y −50.18
Std Dev 6882
Std Dev y 3342
χ² / ndf 3.43 / 3
p0 2468 ± 420.9
p1 −0.04847 ± 0.00802
diff Y position

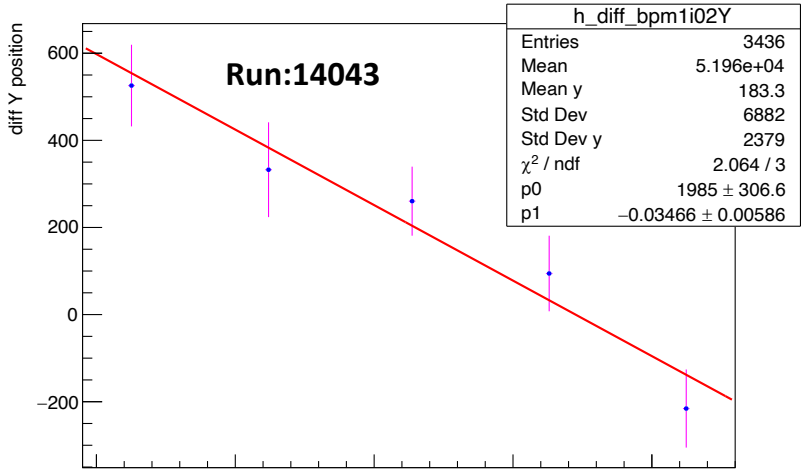

Run:14054
h_diff_bpm0i01bY
Entries 2630
Mean 5.108e+04
Mean y −300
Std Dev 6638
Std Dev y 1603
χ² / ndf 0.1593 / 1
p0 1234 ± 244.3
p1 −0.03001 ± 0.00475
diff Y position
scandata1

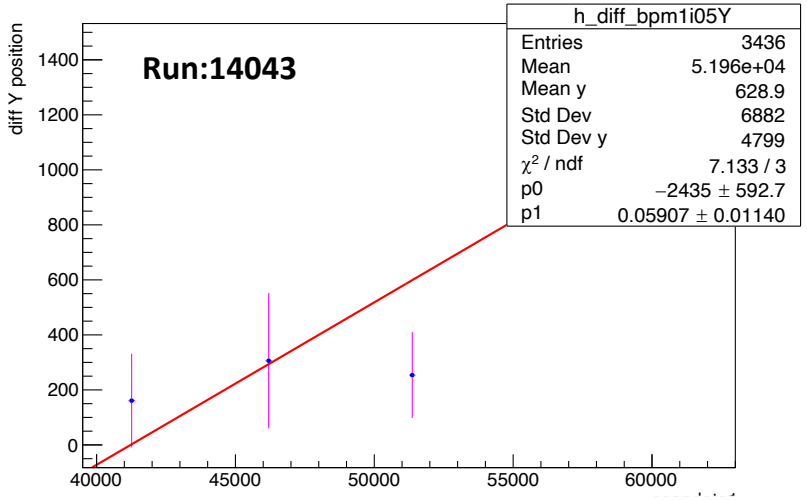

Run:14054
h_diff_bpm0i01Y
Entries 2630
Mean 5.108e+04
Mean y −209.2
Std Dev 6638
Std Dev y 1652
χ² / ndf 0.2461 / 1
p0 −258.2 ± 245.4
p1 0.0009532 ± 0.0048017
diff Y position
scandata1

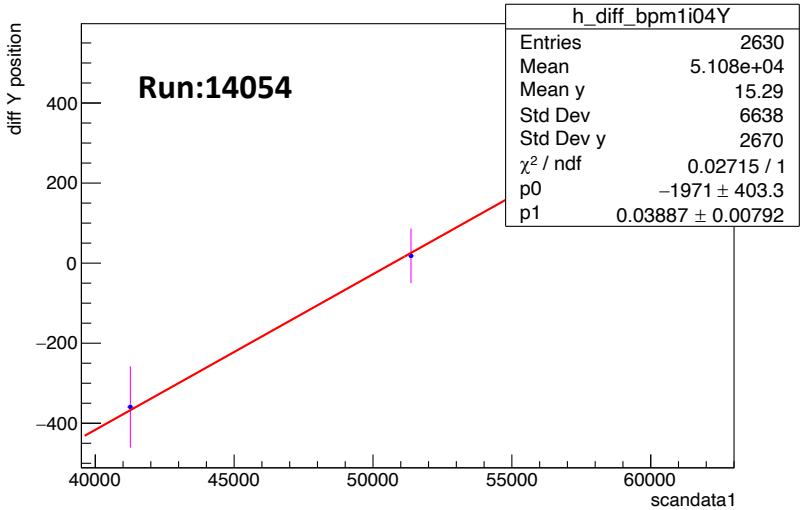

Run:14054
h_diff_bpm0i05Y
Entries 2630
Mean 5.108e+04
Mean y 23.3
Std Dev 6638
Std Dev y 3361
χ² / ndf 0.07306 / 1
p0 2291 ± 506.4
p1 −0.04439 ± 0.00981
diff Y position
scandata1

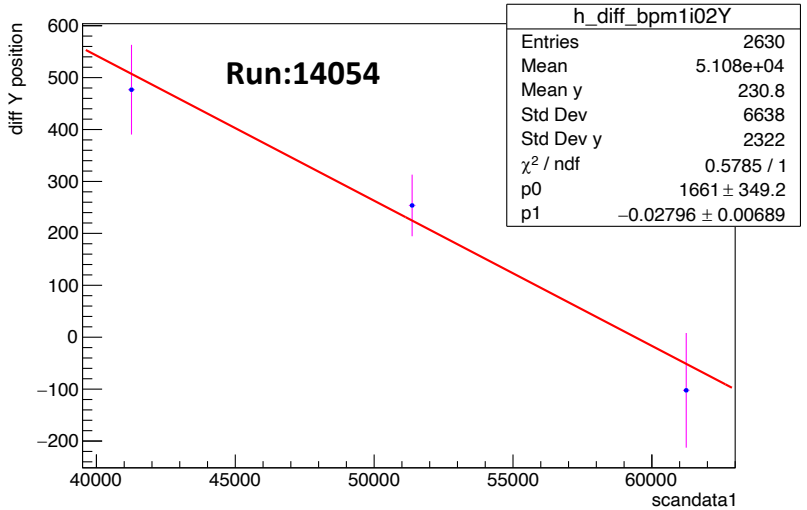
Result

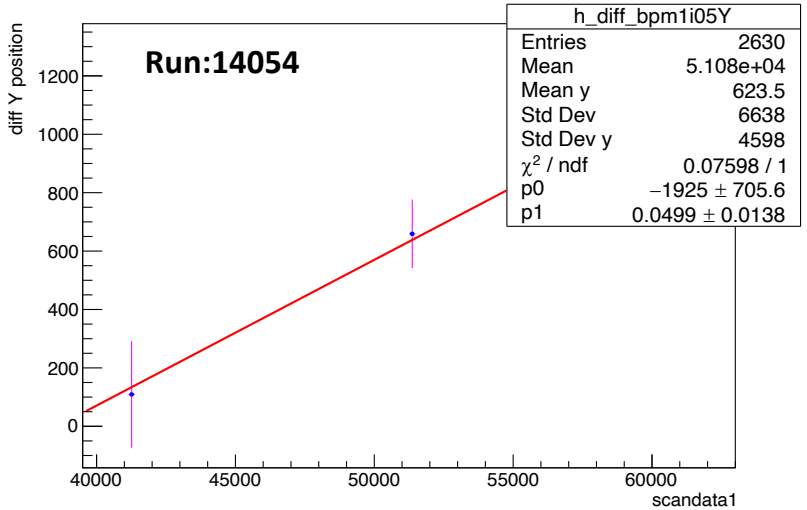

Run:14043
h_diff_bpm1i04Y
Entries 3436
Mean 5.196e+04
Mean y 115.5
Std Dev 6882
Std Dev y 2588
χ² / ndf 5.734 / 3
p0 −2648 ± 321.8
p1 0.05317 ± 0.00617
diff Y position


Run:14043
h_diff_bpm1i02Y
Entries 3436
Mean 5.196e+04
Mean y 183.3
Std Dev 6882
Std Dev y 2379
χ² / ndf 2.064 / 3
p0 1985 ± 306.6
p1 −0.03466 ± 0.00586
diff Y position

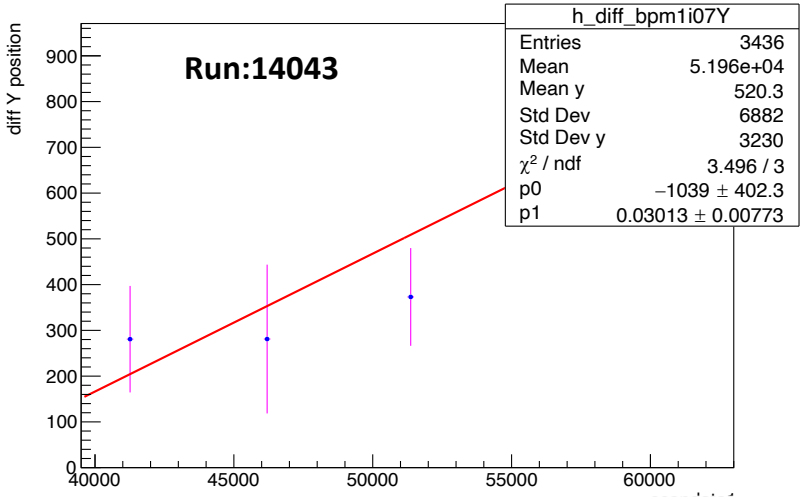

Run:14043
h_diff_bpm1i05Y
Entries 3436
Mean 5.196e+04
Mean y 628.9
Std Dev 6882
Std Dev y 4799
χ² / ndf 7.133 / 3
p0 −2435 ± 592.7
p1 0.05907 ± 0.01140
diff Y position

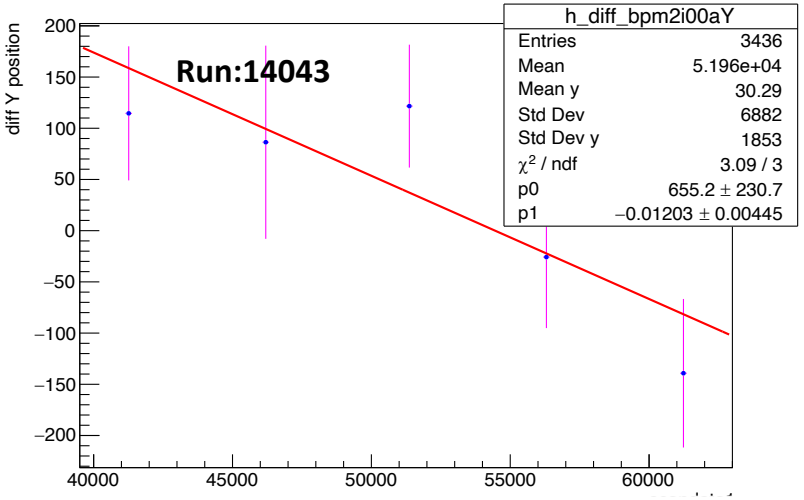

Run:14054
h_diff_bpm1i04Y
Entries 2630
Mean 5.108e+04
Mean y 15.29
Std Dev 6638
Std Dev y 2670
χ² / ndf 0.02715 / 1
p0 −1971 ± 403.3
p1 0.03887 ± 0.00792
diff Y position
scandata1

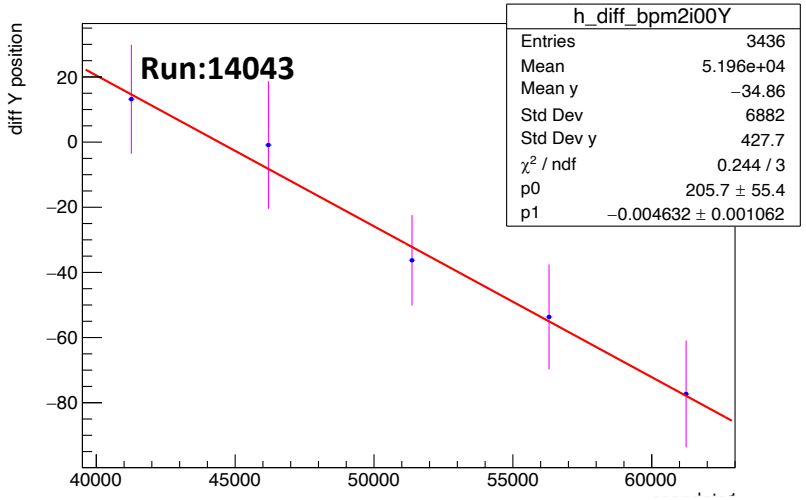

Run:14054
h_diff_bpm1i02Y
Entries 2630
Mean 5.108e+04
Mean y 230.8
Std Dev 6638
Std Dev y 2322
χ² / ndf 0.5785 / 1
p0 1661 ± 349.2
p1 −0.02796 ± 0.00689
diff Y position
scandata1

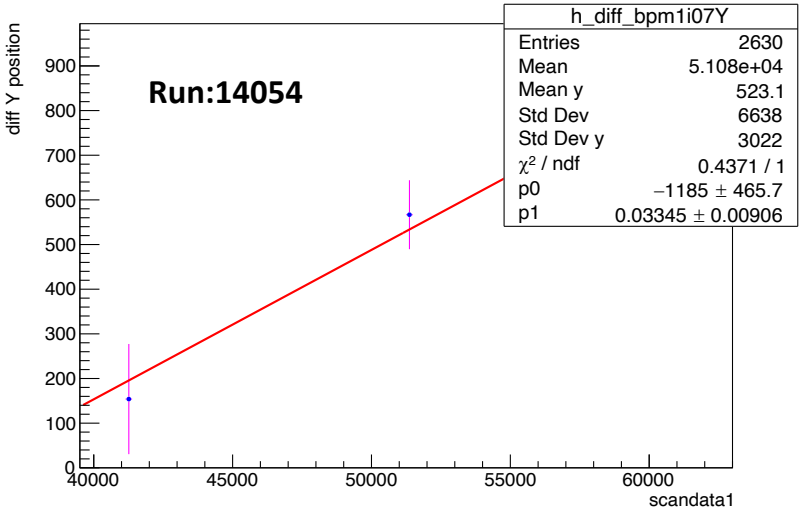

Run:14054
h_diff_bpm1i05Y
Entries 2630
Mean 5.108e+04
Mean y 623.5
Std Dev 6638
Std Dev y 4598
χ² / ndf 0.07598 / 1
p0 −1925 ± 705.6
p1 0.0499 ± 0.0138
diff Y position
scandata1

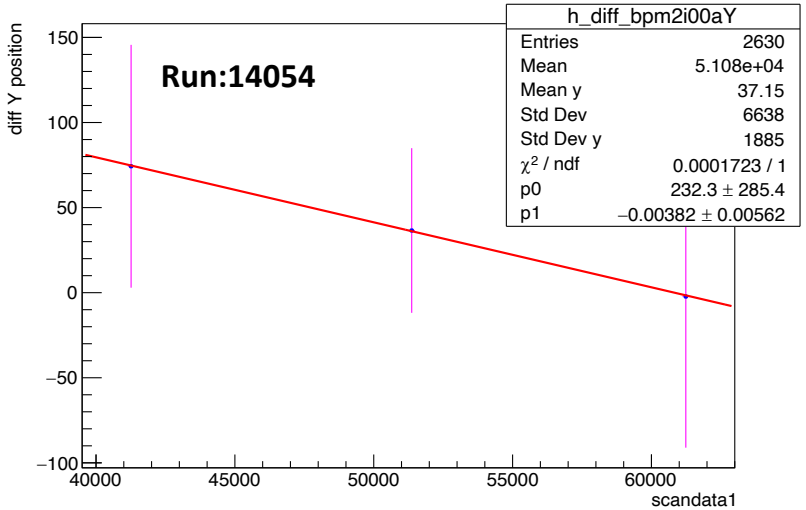
Result

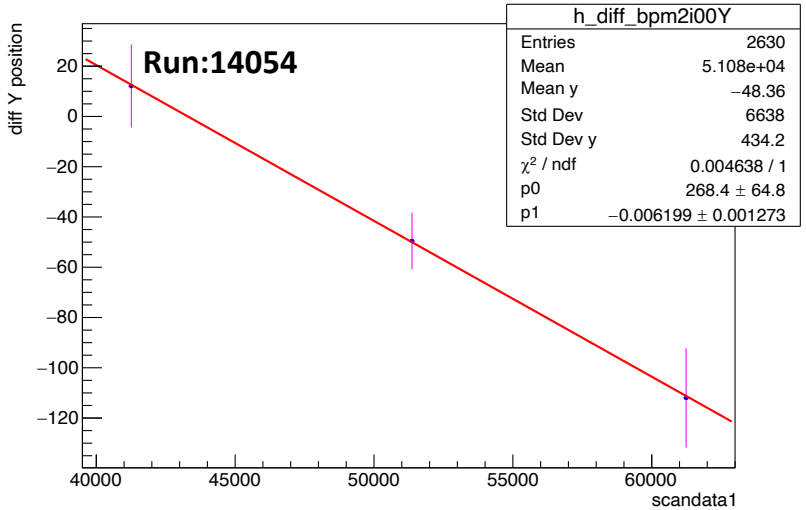
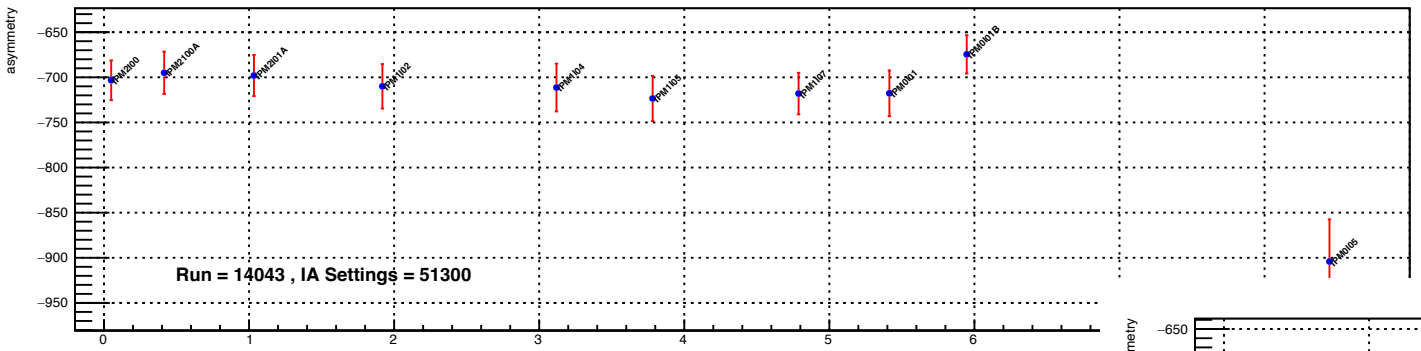
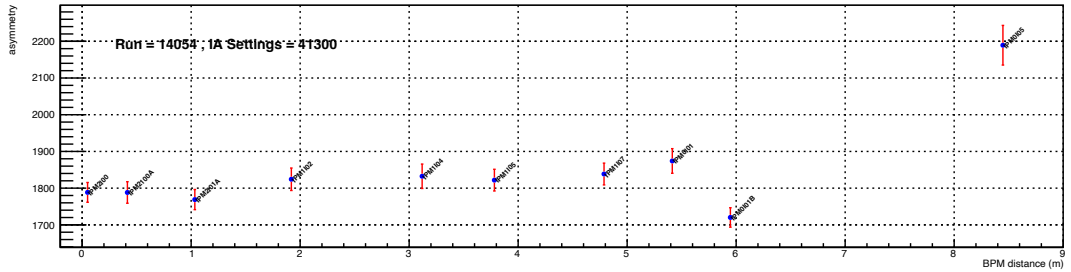
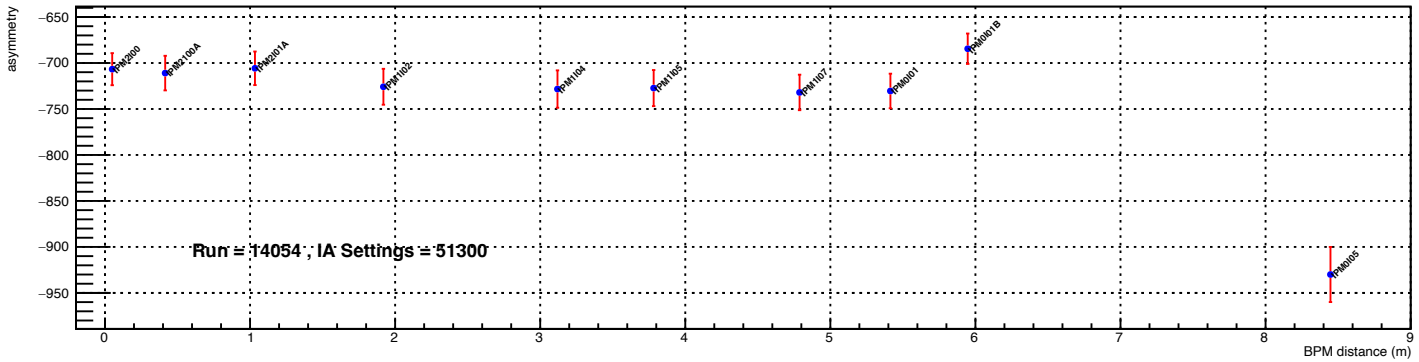
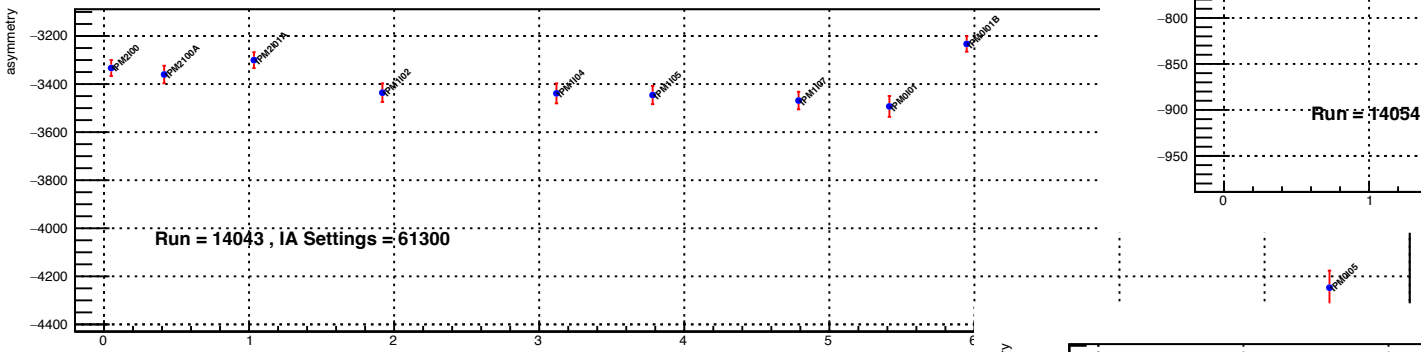
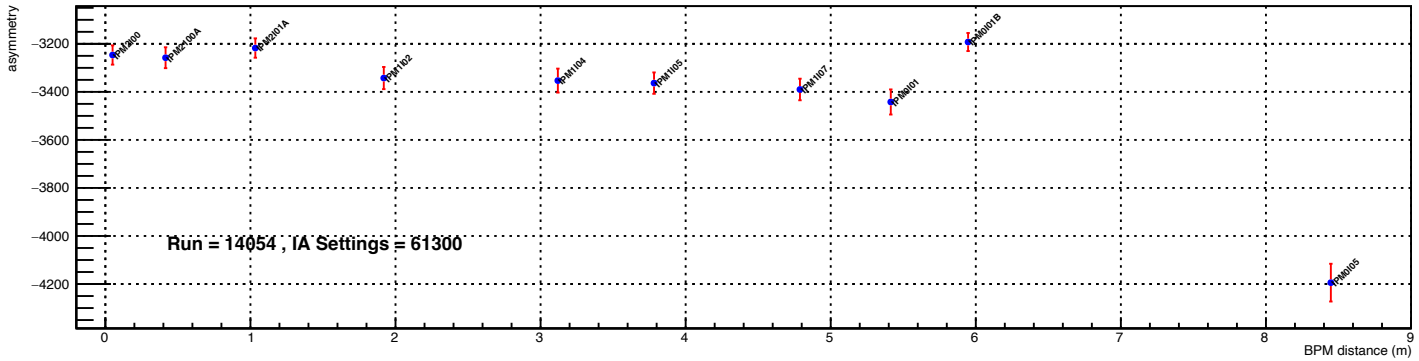

Run:14043
h_diff_bpm1i07Y
Entries 3436
Mean 5.196e+04
Mean y 520.3
Std Dev 6882
Std Dev y 3230
χ² / ndf 3.496 / 3
p0 −1039 ± 402.3
p1 0.03013 ± 0.00773
diff Y position


Run:14043
h_diff_bpm2i00aY
Entries 3436
Mean 5.196e+04
Mean y 30.29
Std Dev 6882
Std Dev y 1853
χ² / ndf 3.09 / 3
p0 655.2 ± 230.7
p1 −0.01203 ± 0.00445
diff Y position


Run:14043
h_diff_bpm2i00Y
Entries 3436
Mean 5.196e+04
Mean y −34.86
Std Dev 6882
Std Dev y 427.7
χ² / ndf 0.244 / 3
p0 205.7 ± 55.4
p1 −0.004632 ± 0.001062
diff Y position


Run:14054
h_diff_bpm1i07Y
Entries 2630
Mean 5.108e+04
Mean y 523.1
Std Dev 6638
Std Dev y 3022
χ² / ndf 0.4371 / 1
p0 −1185 ± 465.7
p1 0.03345 ± 0.00906
diff Y position
scandata1


Run:14054
h_diff_bpm2i00aY
Entries 2630
Mean 5.108e+04
Mean y 37.15
Std Dev 6638
Std Dev y 1885
χ² / ndf 0.0001723 / 1
p0 232.3 ± 285.4
p1 −0.00382 ± 0.00562
diff Y position
scandata1


Run:14054
h_diff_bpm2i00Y
Entries 2630
Mean 5.108e+04
Mean y −48.36
Std Dev 6638
Std Dev y 434.2
χ² / ndf 0.004638 / 1
p0 268.4 ± 64.8
p1 −0.006199 ± 0.001273
diff Y position
scandata1

Asymmetry vs bpm positions