Testing of the Helicity Board

Parity DAQ run summary for "Checking Helicity Board New Settings with Beam, 28feb"

Lognumber 4258232. Submitted by pking on Wed, 02/28/2024 - 13:11.

Last updated on Wed, 02/28/2024 - 13:31

Logbooks:	POLOG
Entry Makers:	pking, asen, bruker

Injector runs 14916-14926 are various tests at 30Hz and 240Hz with the number of samples and HAPTB settings, but we were having trouble getting the HAPTB ramp scan function to work properly. Eventually reboot the DAQ crate.

* Helicity board is set for 240 Hz: Tsettle==100us, Tstable==4066.67us

Run 14927: This is a ramp delay scan with 500 samples per block. We see the leading edge of the TStable at a delay of ~25. Don't see the trailing edge of the TStable, so we should increase the number of VQWK samples.

Run 14928: This is a ramp delay scan with 510 samples per block. We see the leading edge of the TStable at a delay of ~25 and the trailing edge of the TStable at delay of ~18. We don't have an overlap, so we have too many samples. Want to shift the trailing edge to about 35, which is 17 steps of 2.5us or 42.5us. That would be about 21 VQWK samples, so we want to reduce the samples per block by 5.

Run 14929: This is a ramp delay scan with 505 samples per block.

Run 14930: These are the good injector DAQ settings for 240Hz: VQWK samples per block == 505, HAPTB ramp delay ==30.

* The following runs have 10uA of beam from the Hall C laser terminating at FC1.

Run 14931: Hall C IA scan at 240 Hz, with quartets and delay by 8. IA settings 11665, 16665, 6665, 11665.

Run 14932: Hall C IA scan at 240 Hz, with Thue-Morse-64 and delay by 128. IA settings 11665, 16665, 6665, 11665.

Run 14933: Hall C IA scan at 240 Hz, with 16-Quad and delay by 128. IA settings 11665, 16665, 6665, 11665.

Run 14934: Hall C IA scan at 240 Hz, with 32-Pair and delay by 128. IA settings 11665, 16665, 6665, 11665.

Run 14935: Hall C IA scan at 240 Hz, with Quartet and delay by 128. IA settings 11665, 16665, 6665, 11665.

Run 14936: Hall C IA scan at 240 Hz, with Quartet and no delay. IA settings 11665, 16665, 6665, 11665.

Run 14937: Hall C IA scan at 240 Hz, with Thue-Morse-64 and no delay. IA settings 11665, 16665, 6665, 11665.

Run 14938: BPM pedestal run with "gains off". Quartet and delay 8. FC1 current 8.3uA (scandata1 was 10 then 8), 5.9uA (scandata1 6), 10.1uA (scandata1 10).

* Reset helicity board to 30Hz quartets with delay 8

Run 14939: Test run at 30Hz after resetting the DAQ settings for 30 Hz mode.

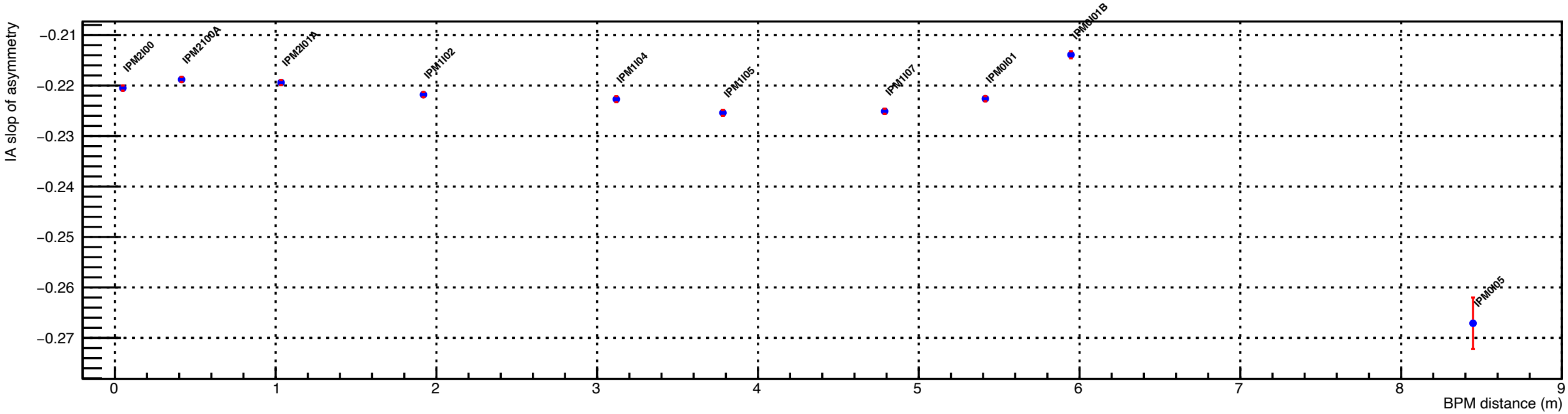
Run 14940: Hall C IA scan at 30 Hz, with quartets and delay by 8. IA settings 11665, 16665, 6665, 11665.

https://logbooks.jlab.org/entry/4258232
https://logbooks.jlab.org/entry/4258233

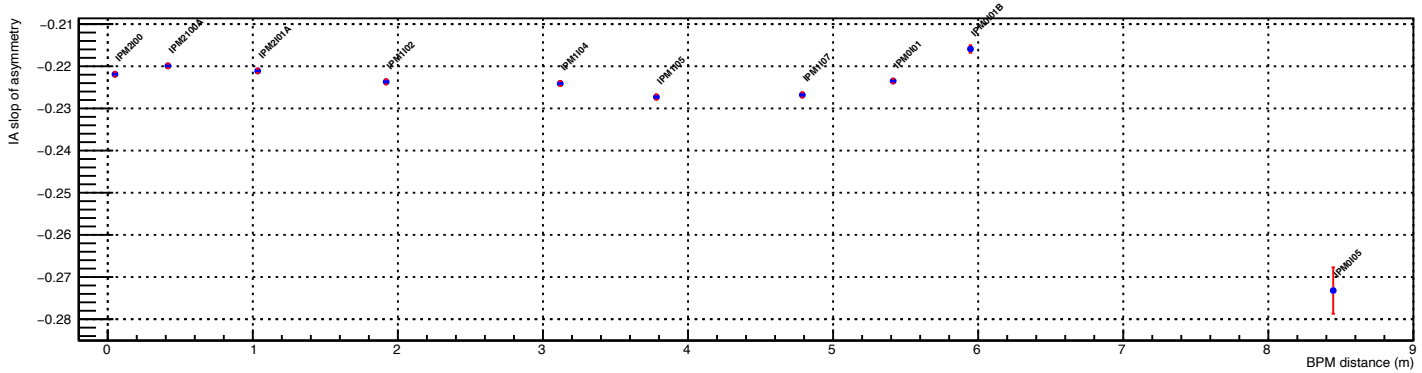
IA slope of Asymmetry

Variable name	14931 Slope	14931 Slope Error	14935 Slope	14935 Slope Error	14936 Slope	14936 Slope Error	14937 Slope	14937 Slope Error
	Quartets and delay by 8		Quartet and delay by 128		Quartet and no delay		Thue-Morse-64 and no delay	
asym_bpm2i00WS	-0.2205	0.0005	-0.2219	0.0005	-0.2208	0.0005	-0.2225	0.0006
asym_bpm2i00aWS	-0.2188	0.0005	-0.2199	0.0005	-0.2188	0.0005	-0.2202	0.0006
asym_bpm2i01aWS	-0.2194	0.0005	-0.2211	0.0005	-0.22	0.0005	-0.2216	0.0006
asym_bpm1i02WS	-0.2218	0.0005	-0.2237	0.0006	-0.2225	0.0005	-0.2242	0.0007
asym_bpm1i04WS	-0.2227	0.0006	-0.2241	0.0006	-0.2225	0.0006	-0.2243	0.0007
asym_bpm1i05WS	-0.2254	0.0006	-0.2273	0.0006	-0.2256	0.0006	-0.2274	0.0007
asym_bpm1i07WS	-0.2251	0.0005	-0.2268	0.0006	-0.2257	0.0006	-0.2269	0.0007
asym_bpm0i01WS	-0.2226	0.0005	-0.2235	0.0005	-0.2224	0.0006	-0.2244	0.0008
asym_bpm0i01bWS	-0.2139	0.0007	-0.2159	0.0009	-0.2148	0.0009	-0.2172	0.0009
asym_bpm0i05WS	-0.2671	0.0051	-0.2732	0.0055	-0.2732	0.0057	-0.2754	0.0033

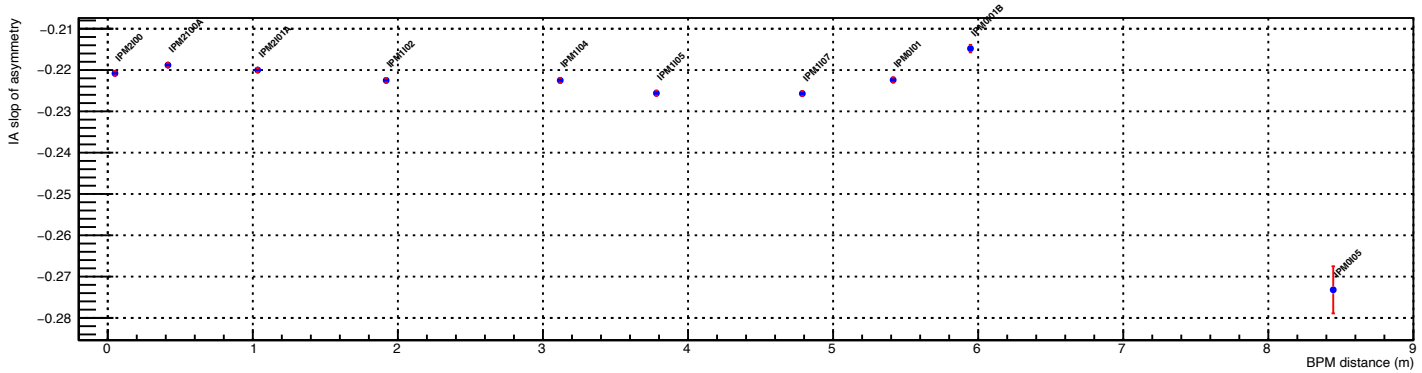
Run = 14931


IA slop of asymmetry
−0.21
−0.22
−0.23
−0.24
−0.25
−0.26
−0.27
IPM2I00
IPM2I00A
IPM2I01A
IPM1I02
IPM1I04
IPM1I05
IPM1I07
IPM0I01
IPM0I01B
IPM0I05
0
1
2
3
4
5
6
7
8
9
BPM distance (m)

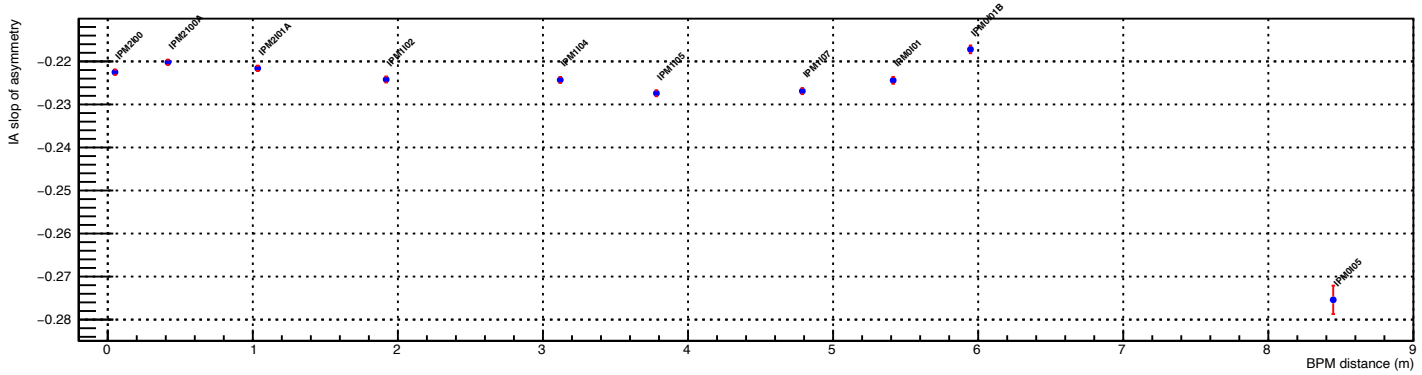
14935



14936



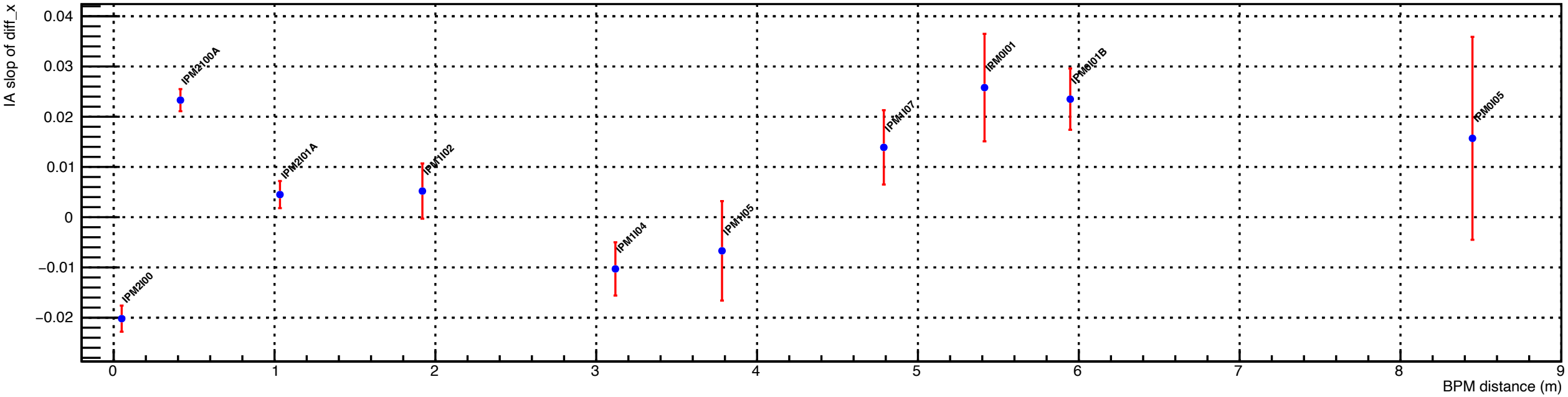
14937



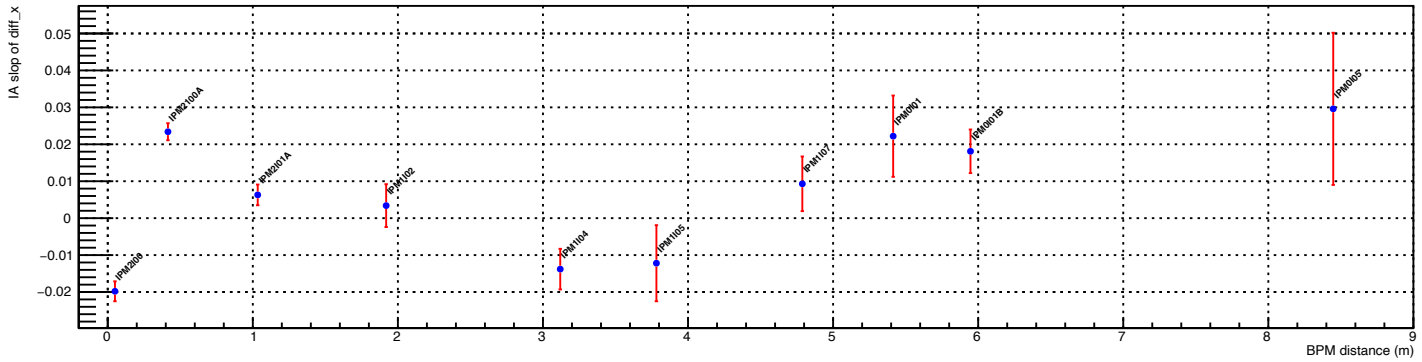
Diff X pos IA slope

Variable name	14931 Slope	14931 Slope Error	14935 Slope	14935 Slope Error	14936 Slope	14936 Slope Error	14937 Slope	14937 Slope Error
	Quartets and delay by 8		Quartet and delay by 128		Quartet and no delay		Thue-Morse-64 and no delay	
diff_bpm2i00X	-0.0202	0.0026	-0.0198	0.0027	-0.0213	0.0026	-0.017	0.002
diff_bpm2i00aX	0.0233	0.0022	0.0234	0.0023	0.0235	0.0022	0.0246	0.0017
diff_bpm2i01aX	0.0045	0.0027	0.0063	0.0028	0.0032	0.0027	0.0021	0.002
diff_bpm1i02X	0.0052	0.0055	0.0034	0.0058	0.0164	0.0055	0.011	0.0014
diff_bpm1i04X	-0.0103	0.0053	-0.0138	0.0055	-0.0047	0.0053	-0.0114	0.0015
diff_bpm1i05X	-0.0067	0.0099	-0.0122	0.0103	0.002	0.0097	-0.0095	0.0056
diff_bpm1i07X	0.0139	0.0074	0.0093	0.0074	0.0099	0.0073	0.0034	0.0065
diff_bpm0i01X	0.0258	0.0107	0.0222	0.011	0.0116	0.0105	0.0222	0.0065
diff_bpm0i01bX	0.0235	0.0061	0.0181	0.0059	0.013	0.0062	0.0172	0.0036
diff_bpm0i05X	0.0157	0.0202	0.0296	0.0206	-0.0151	0.0193	0.0213	0.0117

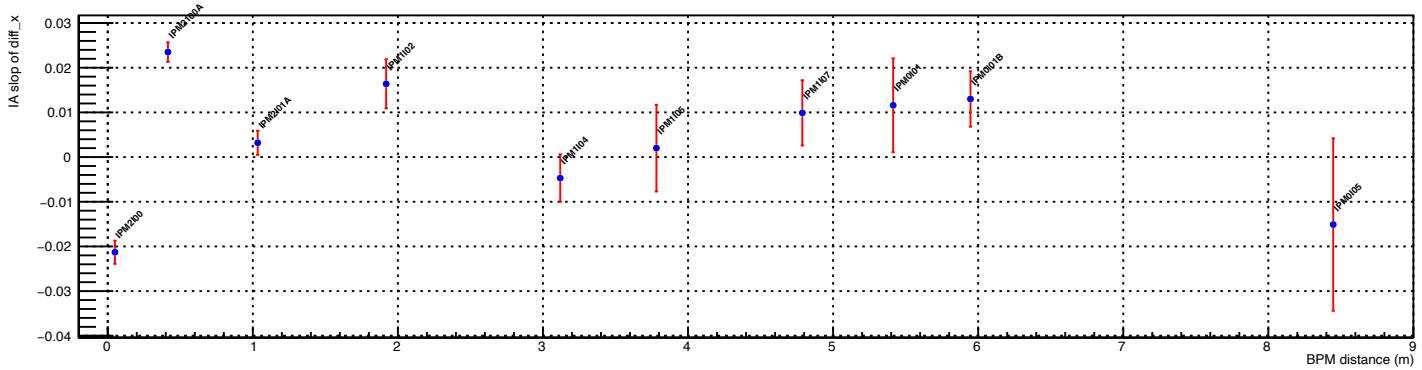
Run = 14931


IA slop of diff_x
0.04
0.03
0.02
0.01
0
−0.01
−0.02
IPM2I00A
IPM2I01A
IPM1I02
IPM1I04
IPM1I05
IPM1I07
IRM0I01
IPM0I01B
IPM0I05
IPM2I00
0
1
2
3
4
5
6
7
8
9
BPM distance (m)

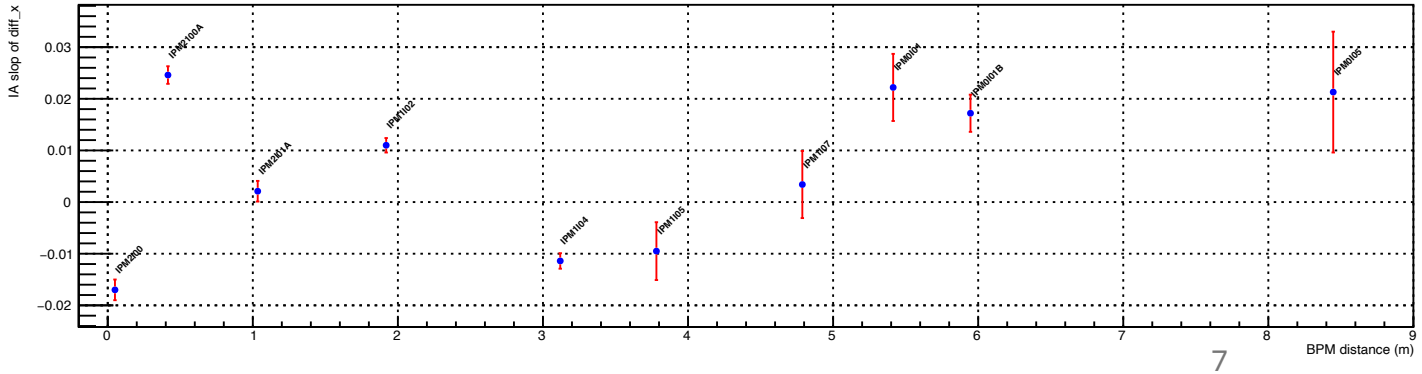
14935



14936



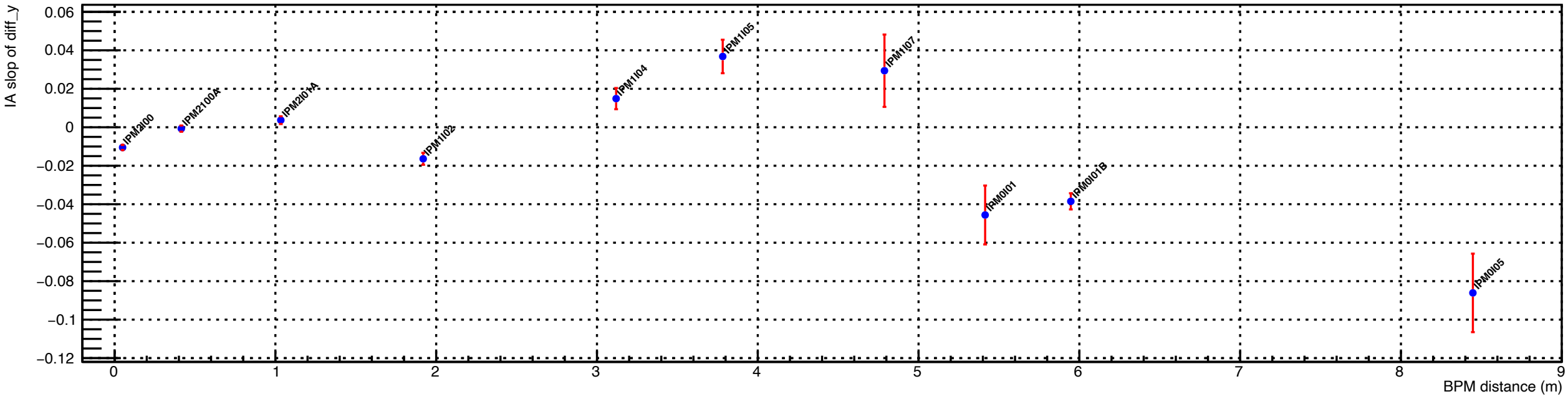
14937



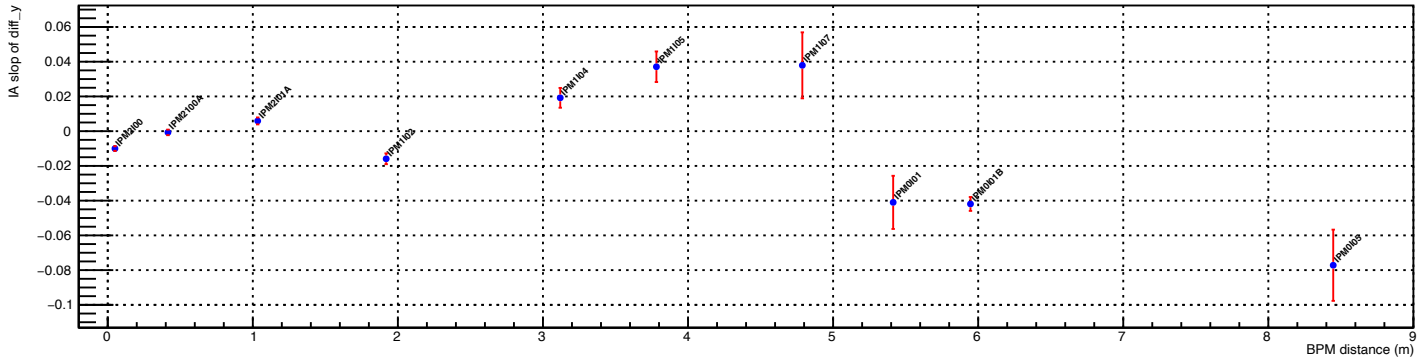
Diff Y pos IA slope

Variable name	14931 Slope	14931 Slope Error	14935 Slope	14935 Slope Error	14936 Slope	14936 Slope Error	14937 Slope	14937 Slope Error
	Quartets and delay by 8		Quartet and delay by 128		Quartet and no delay		Thue-Morse-64 and no delay	
diff_bpm2i00Y	-0.0105	0.0013	-0.01	0.0013	-0.0088	0.0013	-0.0087	0.0013
diff_bpm2i00aY	-0.0007	0.0016	-0.0007	0.0016	0	0.0016	0.0009	0.0016
diff_bpm2i01aY	0.0037	0.002	0.0059	0.002	0.0006	0.002	0.0043	0.0017
diff_bpm1i02Y	-0.0164	0.0031	-0.0159	0.0031	-0.0161	0.0032	-0.0128	0.0018
diff_bpm1i04Y	0.0149	0.0055	0.0192	0.0057	0.0133	0.0053	0.0156	0.0031
diff_bpm1i05Y	0.0368	0.0087	0.0371	0.0088	0.0332	0.0084	0.038	0.0062
diff_bpm1i07Y	0.0294	0.0188	0.0379	0.019	0.0191	0.0181	0.04	0.0117
diff_bpm0i01Y	-0.0456	0.0153	-0.041	0.0153	-0.0522	0.0149	-0.04	0.0102
diff_bpm0i01bY	-0.0385	0.0042	-0.0419	0.004	-0.0432	0.0042	-0.0402	0.0025
diff_bpm0i05Y	-0.0861	0.0204	-0.0772	0.0205	-0.098	0.0193	-0.0759	0.0148

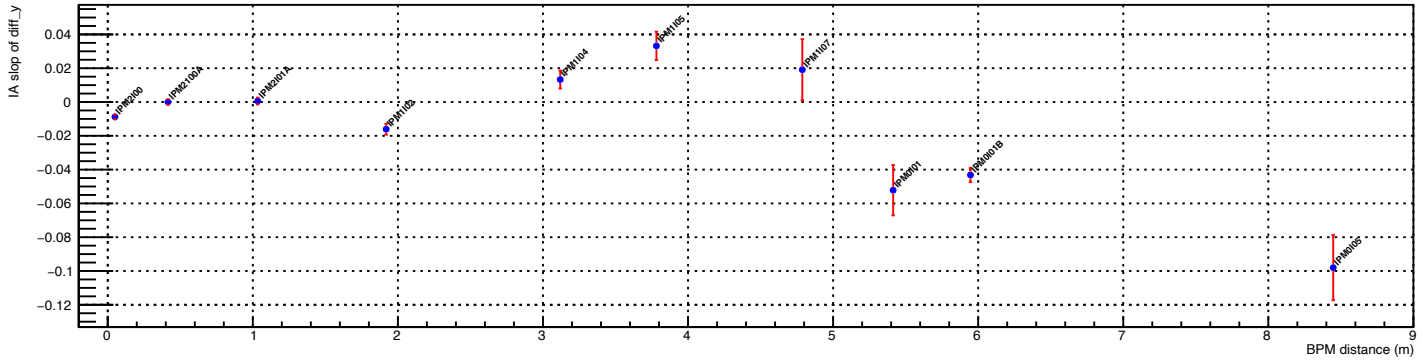
Run = 14931


IA slop of diff_y
0.06
0.04
0.02
0
−0.02
−0.04
−0.06
−0.08
−0.1
−0.12
0
1
2
3
4
5
6
7
8
9
BPM distance (m)
IPM2I00
IPM2100A
IPM2I01A
IPM1I02
IPM1I04
IPM1I05
IPM1I07
IPM0I01
IPM0I01B
IPM0I05

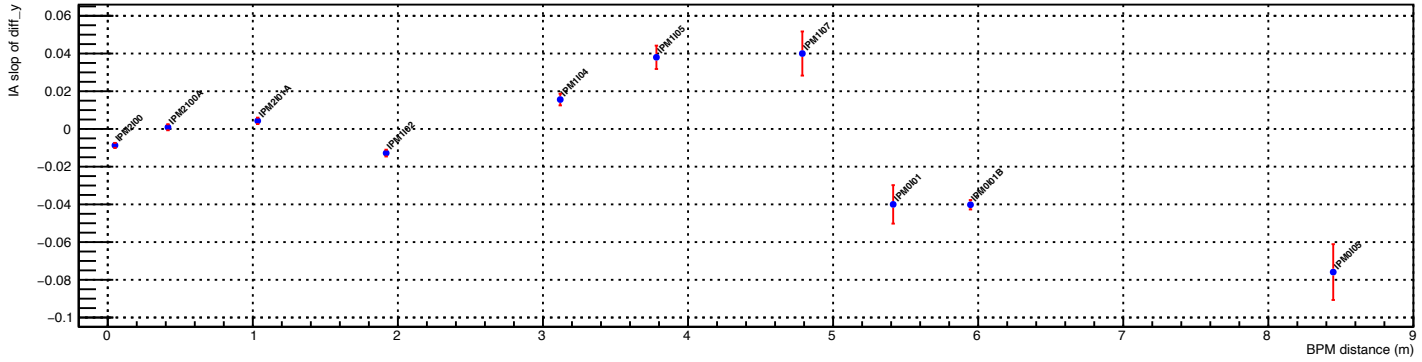
14935



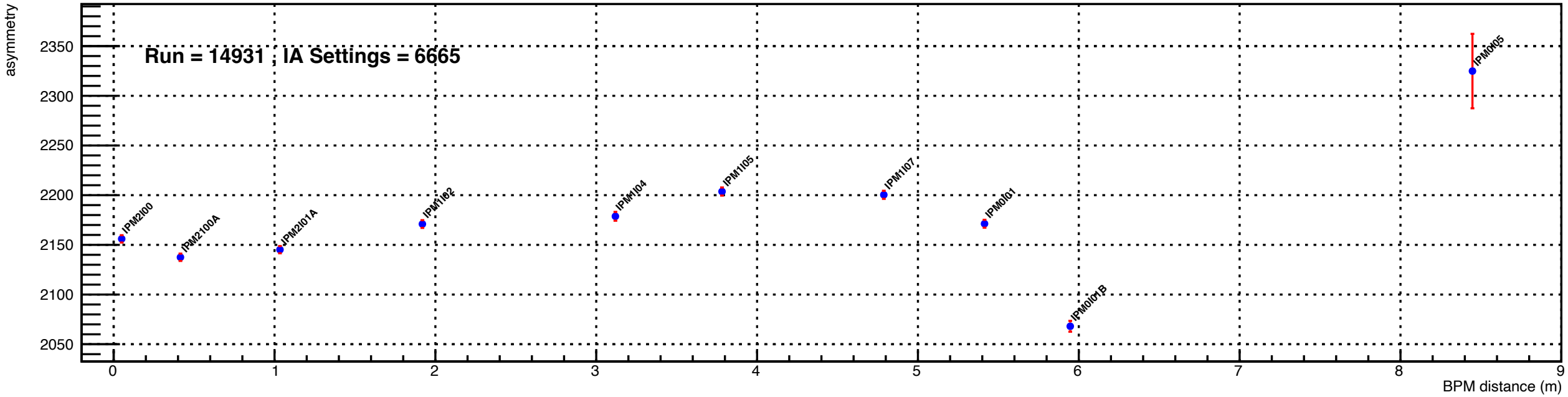
14936



14937



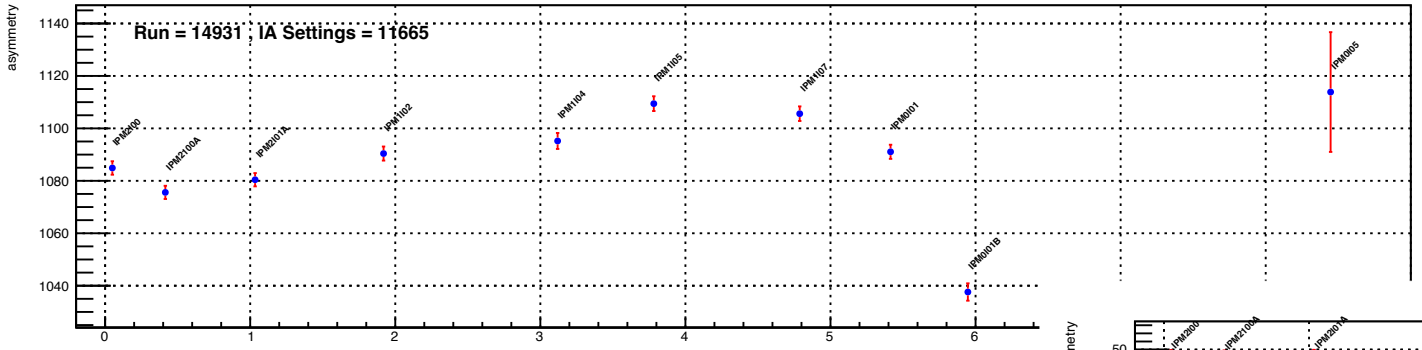
Run = 14931, IA Settings = 6665

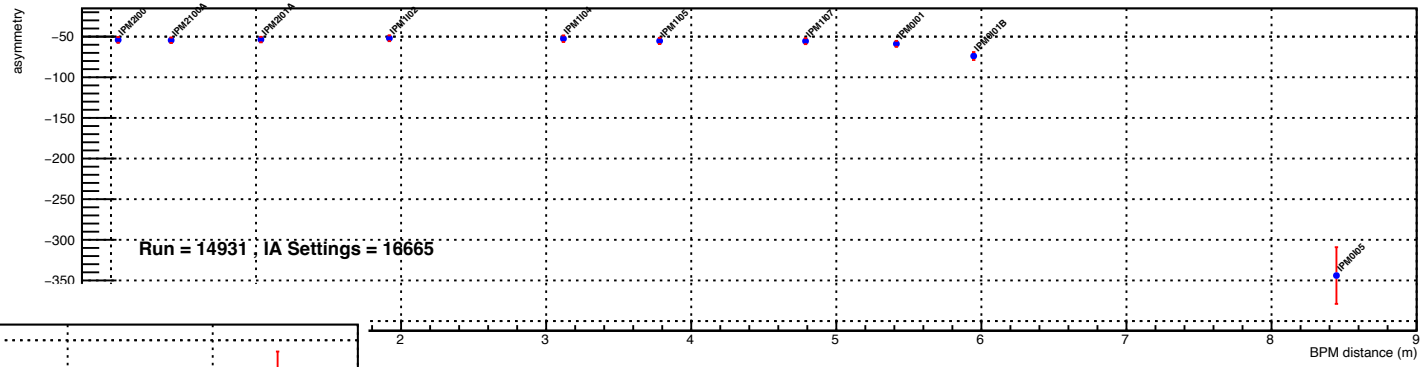


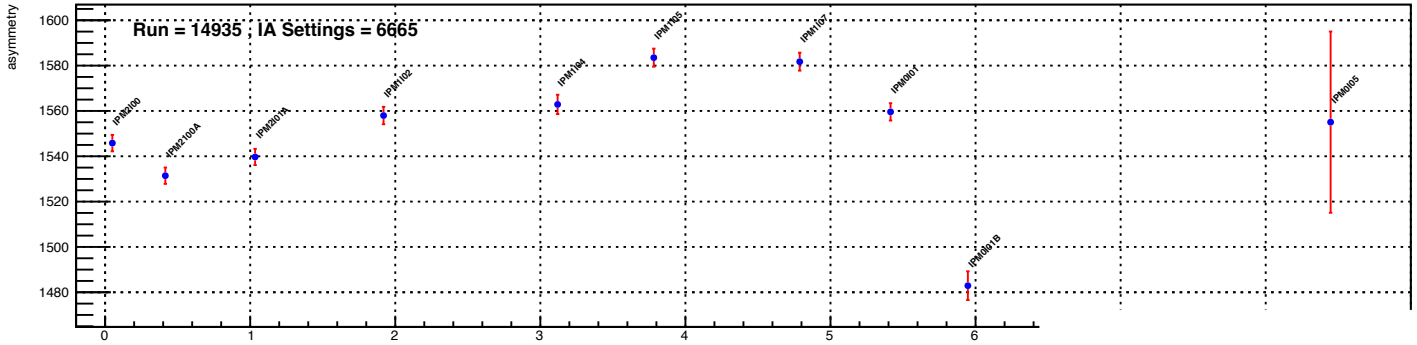
Summary

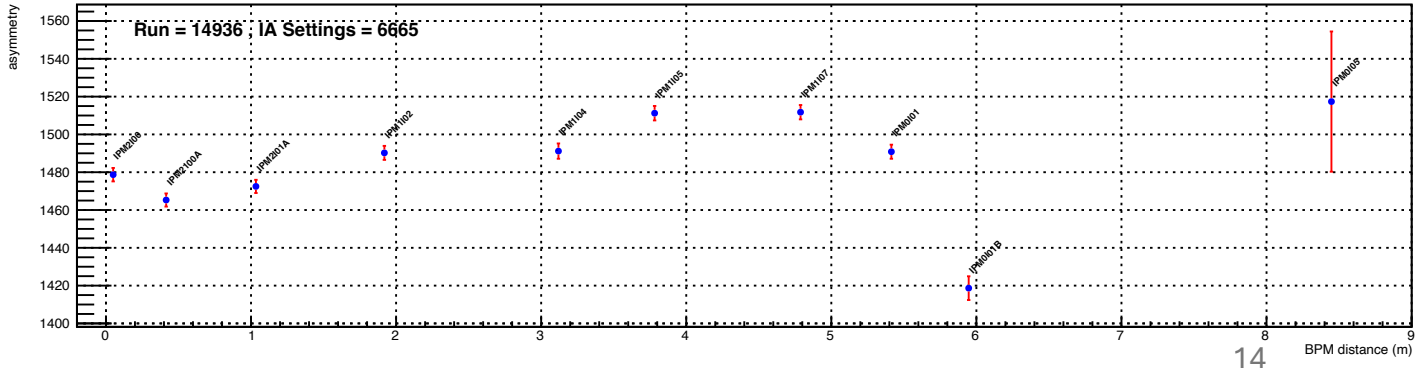
- Data taken up to Faraday cup 1.
- 240 Hz settings worked as expected.
- Slopes of the asymmetry, Diff X and Diff Y looks consistent.
- IPM0I05 shows deflection of values, may be due to A2 and Chopper.
- IPM0I05 has large error bars.

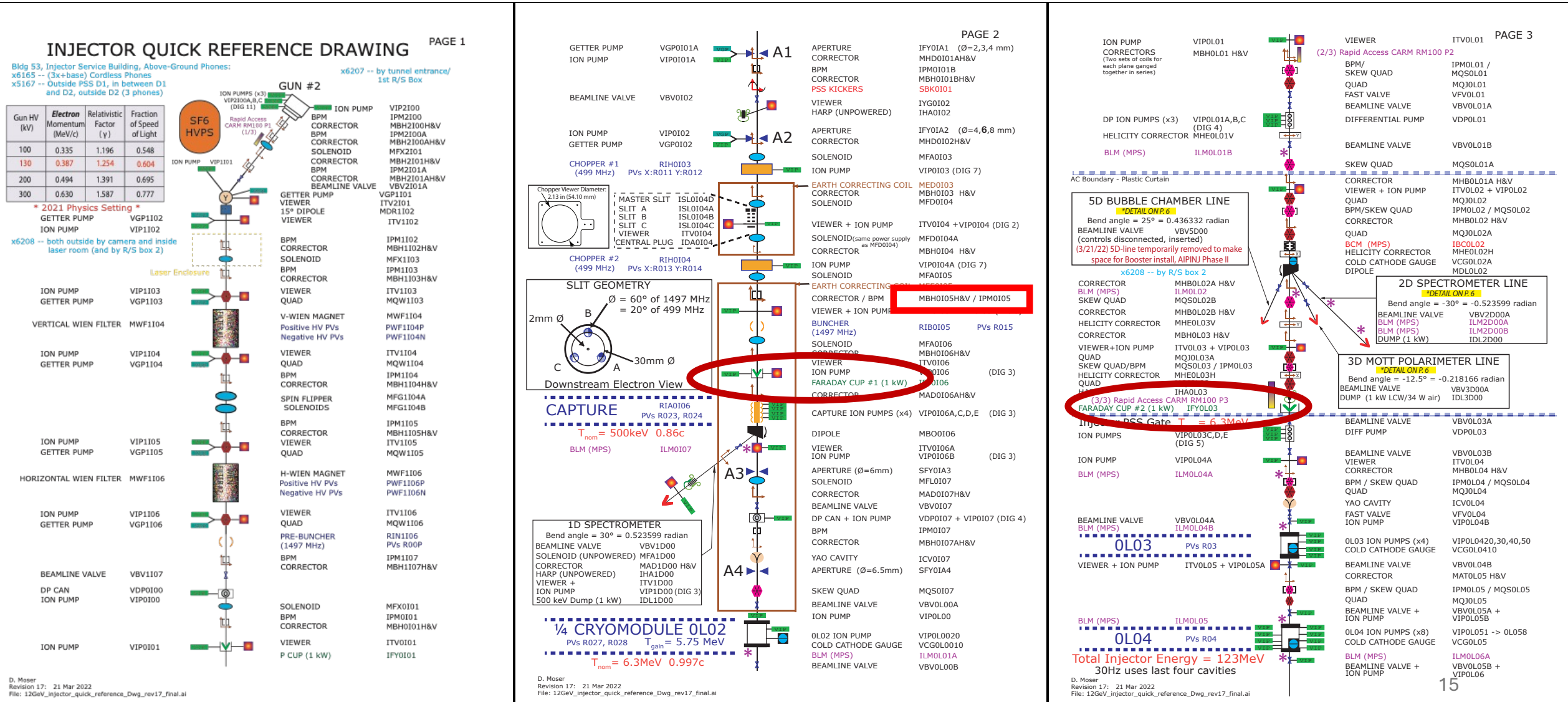
Backup


Run = 14931 , IA Settings = 11665
asymmetry
IPM2100
IPM2100A
IPM2101A
IPM1102
IPM1104
IPM1105
IPM1107
IPM0101
IPM0101B
IPM0105


Run = 14931 , IA Settings = 16665
asymmetry
IPM2100
IPM2100A
IPM2101A
IPM1102
IPM1104
IPM1105
IPM1107
IPM0101
IPM0101B
IPM0105
BPM distance (m)


Run = 14935 , IA Settings = 6665
asymmetry
IPM2100
IPM2100A
IPM2101A
IPM1102
IPM1104
IPM1105
IPM1107
IPM0101
IPM0101B
IPM0105


Run = 14936 , IA Settings = 6665
asymmetry
IPM2100
IPM2100A
IPM2101A
IPM1102
IPM1104
IPM1105
IPM1107
IPM0101
IPM0101B
IPM0105
BPM distance (m)

Injector layout

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