

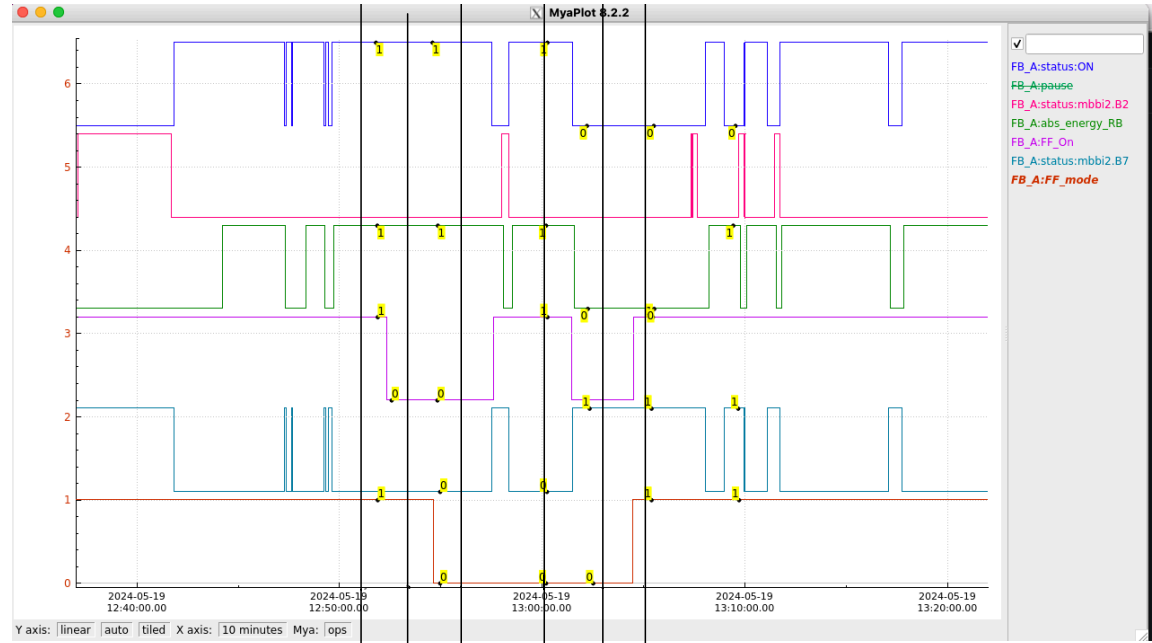
May beam test, FFT and width

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<https://logbooks.jlab.org/entry/4308214>

Strip chart for beam test

- Based on the start times of the test and the ch_scandata1 results, I drew a straight line to indicate when a different setup was initiated. The six black vertical lines on the strip chart represent the moments when each new setup began. By analyzing the on-off patterns in the strip chart, we can identify that FB_A:status:on corresponds to FFB, FF_on indicates FF, and FF_mode represents FF_DAC. This confirms that the setup is functioning as we designed.

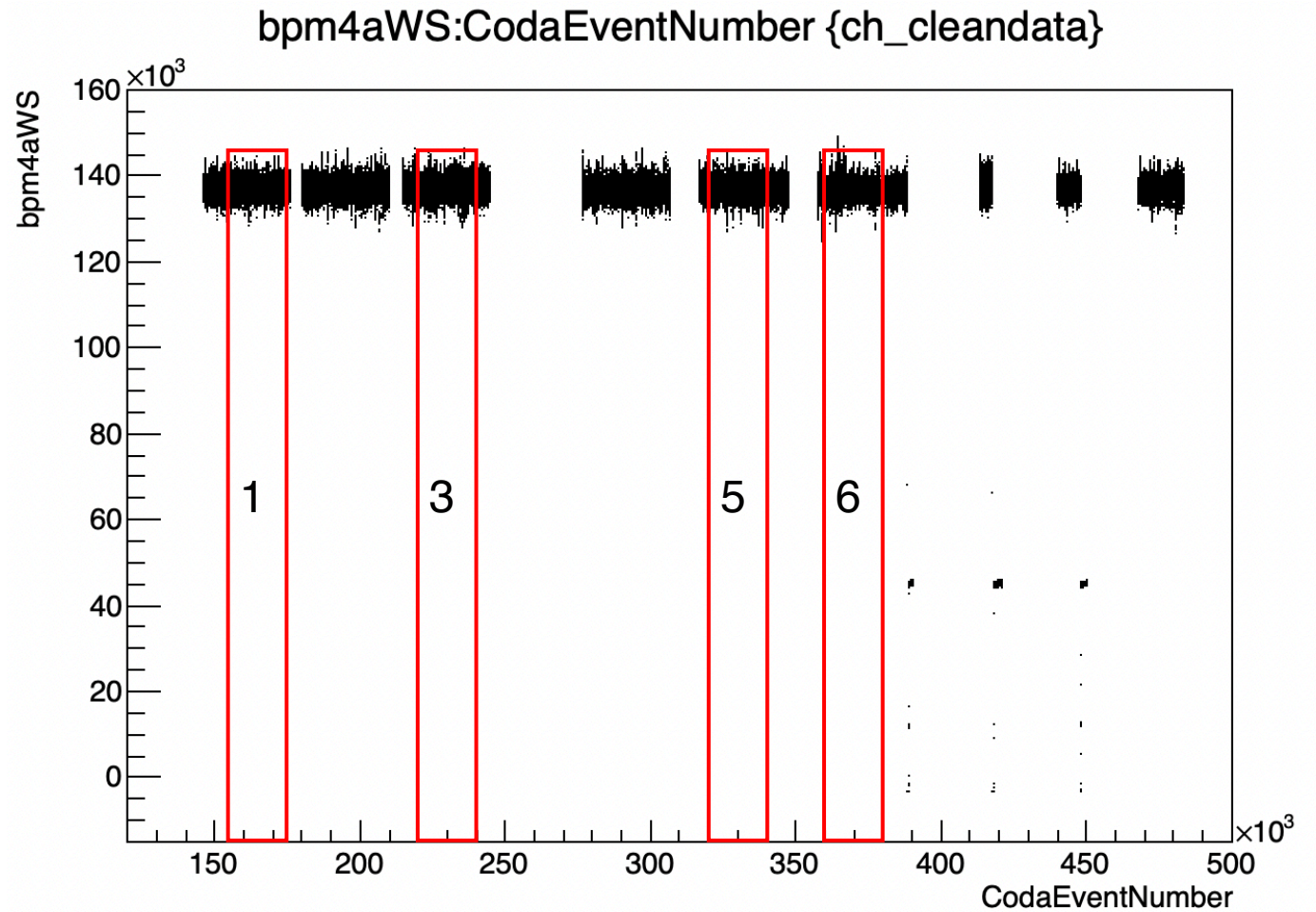


Scandata: 1 → 2 → 3 → 4 → 5 → 6 →

	1	2	3	4	5	6	
FB_A:status:on	1	1	1	1	0	0	✓
mbbi2:B2	0	0	0	0	0	0	
abs_energy_RB	1	1	1	1	0	0	
FF_on	1	0	0	1	0	1	✓
mbbi2:B7	0	0	0	0	1	1	
FF_mode	1	1	0	0	0	1	✓

Based on the table we can see FB_A:status:on is FFB
 FF_on is FF
 FF_mode is FF_DAC

For all the plots on the following slides, I used $4166.65 \mu\text{s}$ as the event period. To select the appropriate time range, I utilized bpm4aWS to ensure that the data collected was accurate. The red rectangles represent different time period for the FFT plots.



Run 16660 Mean and RMS results for Helicity_corrected pairs results

Based on run 16659, I did the calibration for FFB/FF tests in hall A. 20 uA in hall A, two minutes in each configuration. The helicity board is 240 Hz: Tstable = 4066.65 us, Tsettle= 100us, octet, 16 windows delay.

Scandata1	FFB	FF	FFDAC	mean (micron) 4eX	rms (micron) 4eX	mean (micron) 4eY	rms (micron) 4eY
1	on	on	on	0.26 ± 0.09	16.12	1.96 ± 0.24	43.53
2	on	off	on	0.12 ± 0.11	13.89	0.89 ± 0.34	41.77
3	on	off	off	0.87 ± 0.11	13.41	4.23 ± 0.36	43.34
4	on	on	off	0.39 ± 0.12	14.69	1.97 ± 0.36	44.58
5	off	off	off	1.76 ± 0.23	28.26	7.72 ± 0.30	37.35
6	off	on	on	0.68 ± 0.13	16.87	2.71 ± 0.21	27.36

Here we can see for X the rms
reduce when we open FFB

But for Y the rms increase
when we open FFB

More results for Helicity-corrected pairs

Scandata1	FFB	FF	FFDAC	mean (micron) 4aX	rms (micron) 4aX	mean (micron) 4aY	rms (micron) 4aY
1	on	on	on	0.11 ± 0.08	13.51	1.43 ± 0.23	40.62
2	on	off	on	0.08 ± 0.09	11.50	0.76 ± 0.31	37.69
3	on	off	off	0.67 ± 0.09	11.10	3.47 ± 0.32	39.13
4	on	on	off	0.26 ± 0.10	12.07	0.98 ± 0.33	40.38
5	off	off	off	1.32 ± 0.17	20.63	5.50 ± 0.26	32.12
6	off	on	on	0.55 ± 0.10	13.33	1.17 ± 0.22	28.18

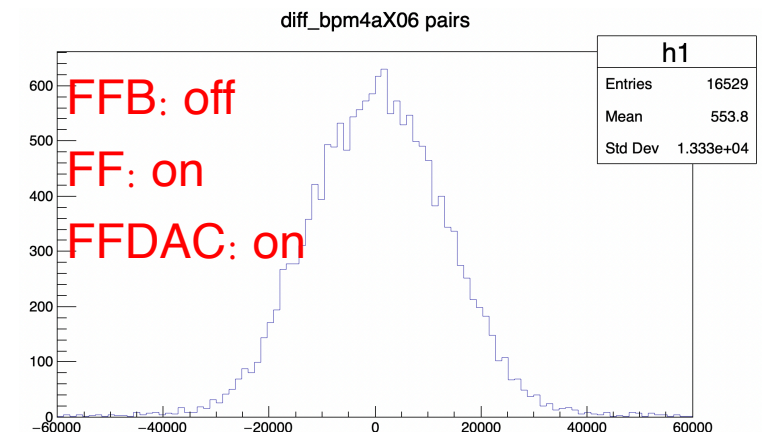
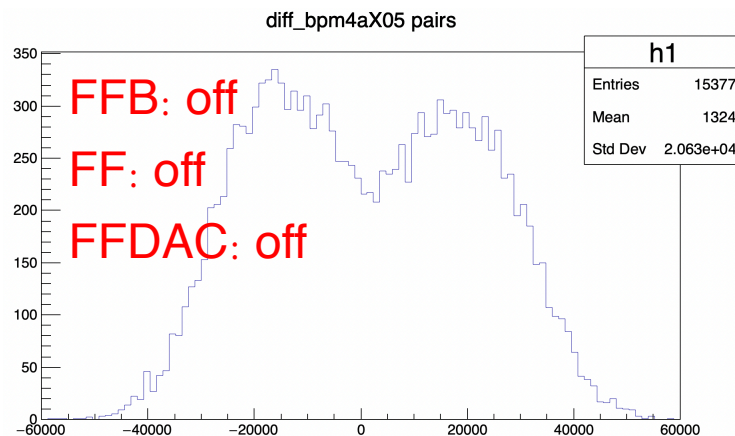
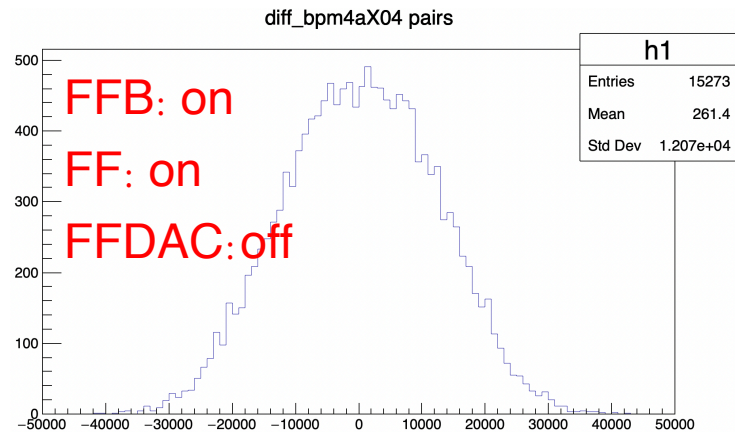
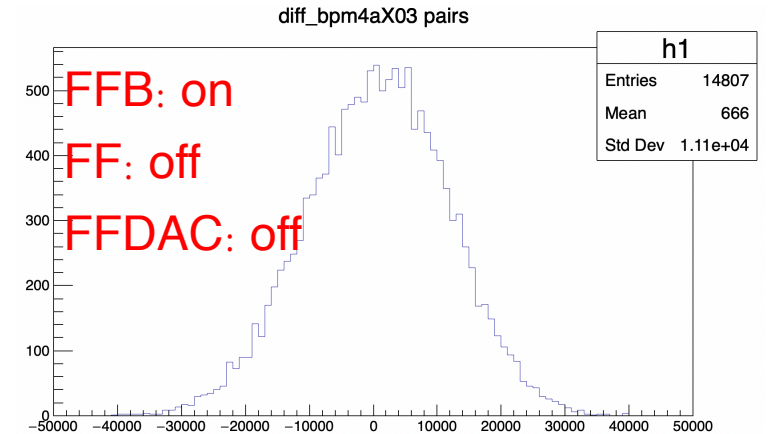
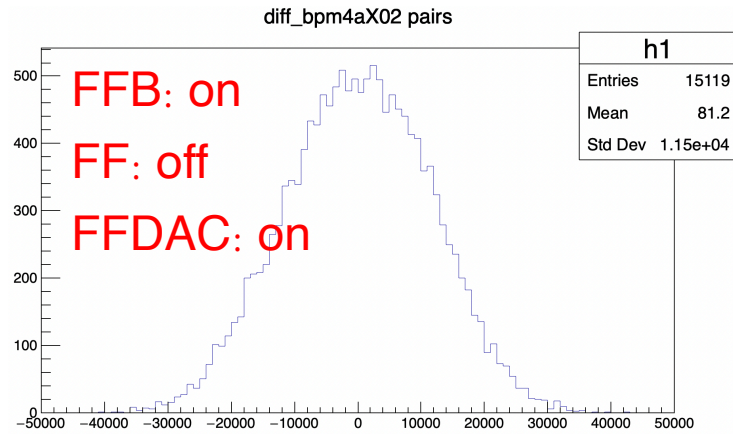
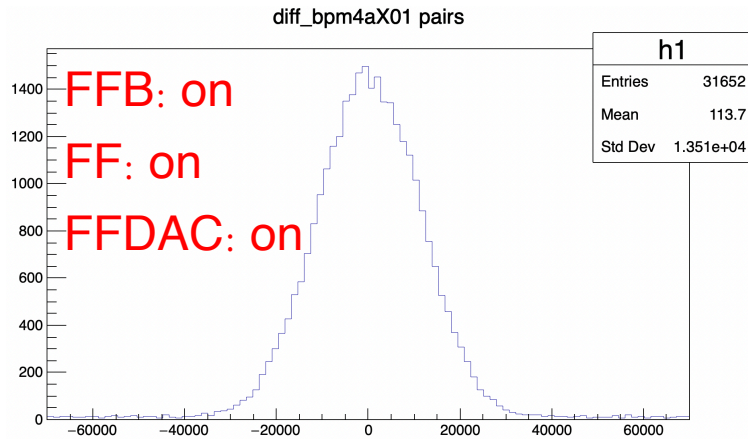


Here we can see for X the rms reduce when we open FFB

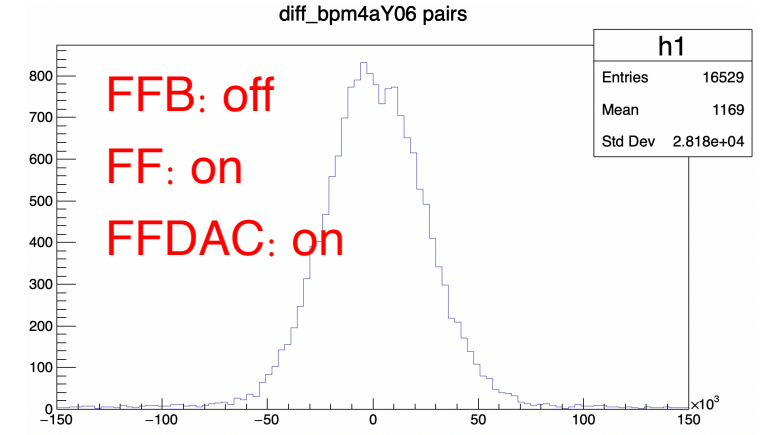
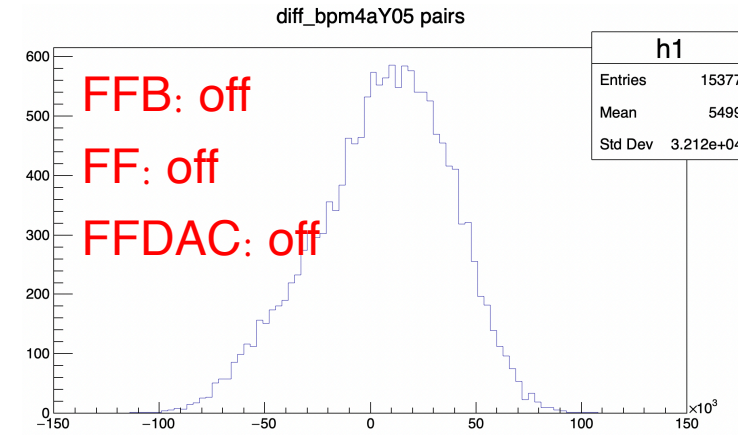
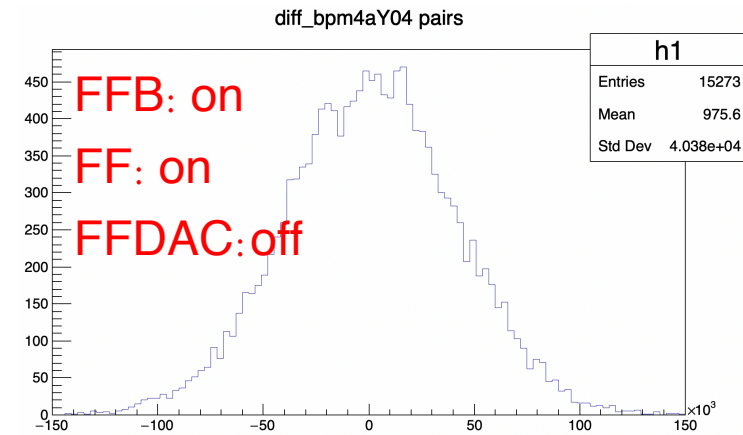
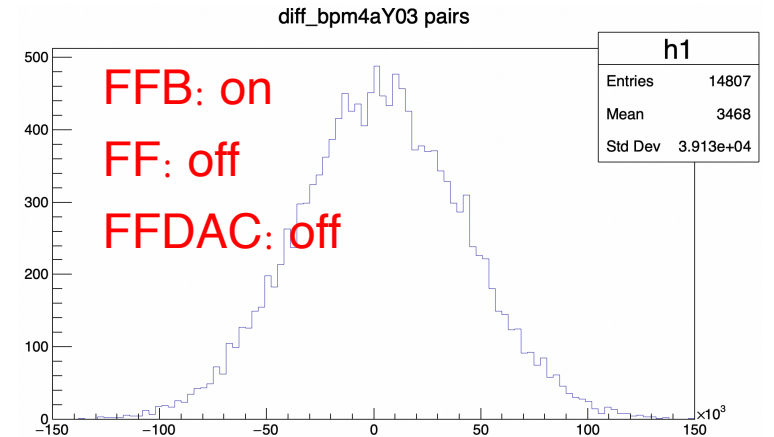
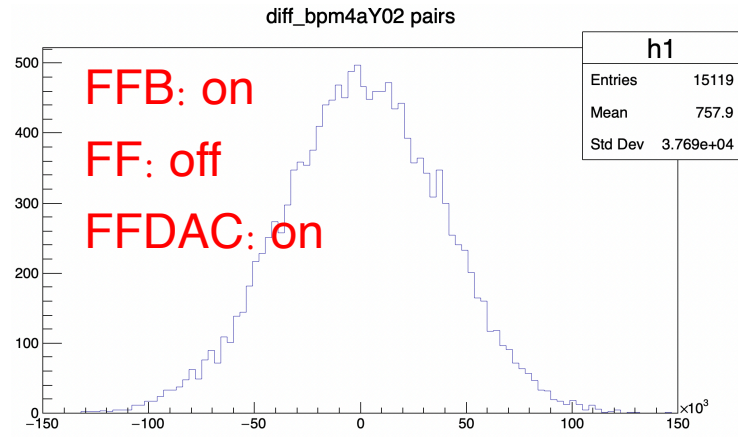
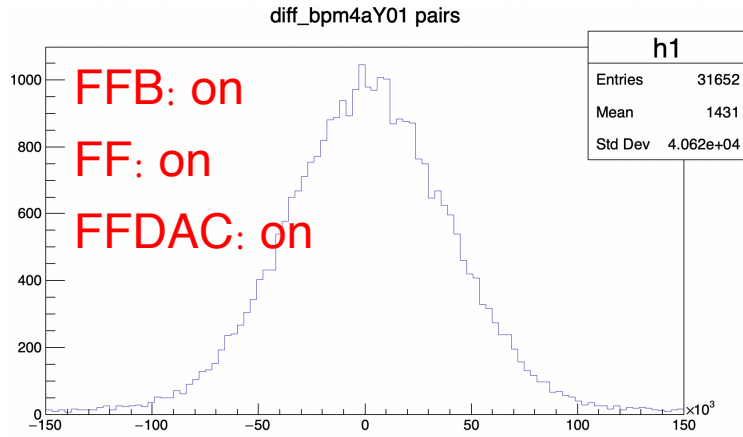


But for Y the rms increase when we open FFB

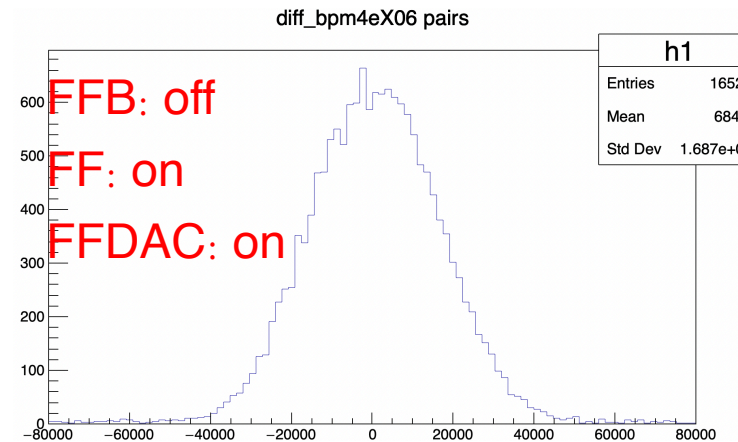
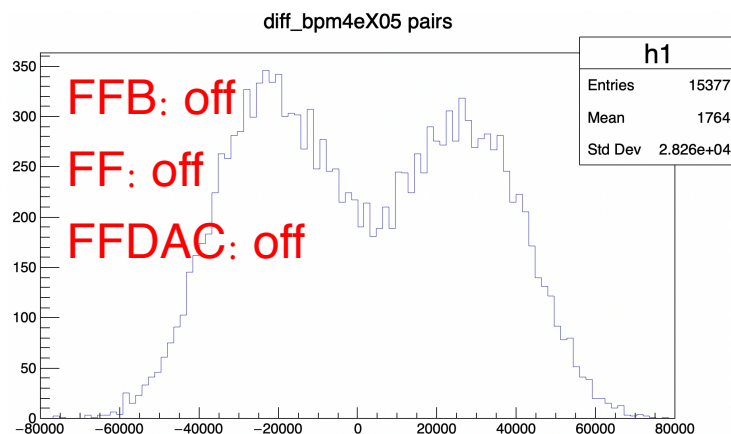
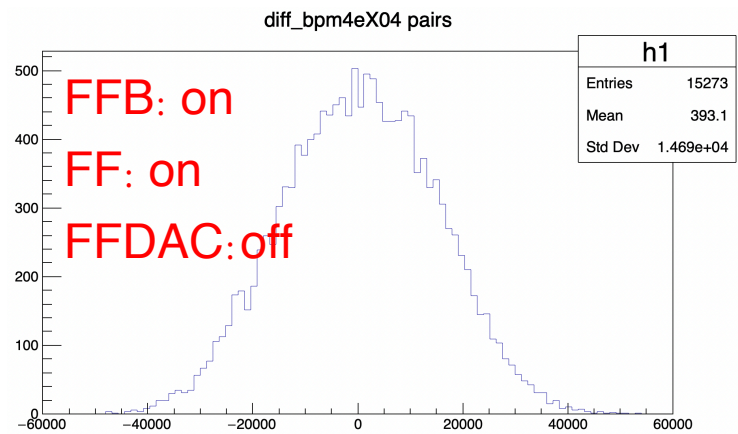
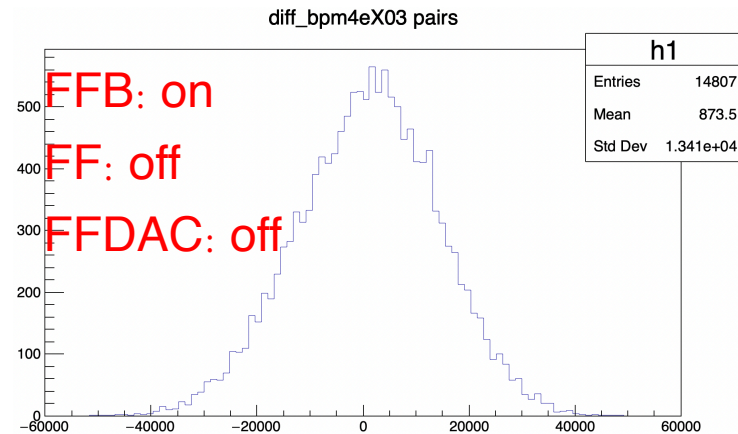
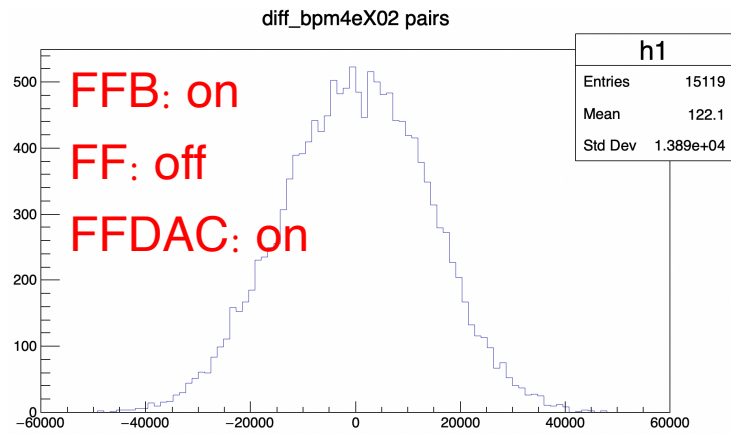
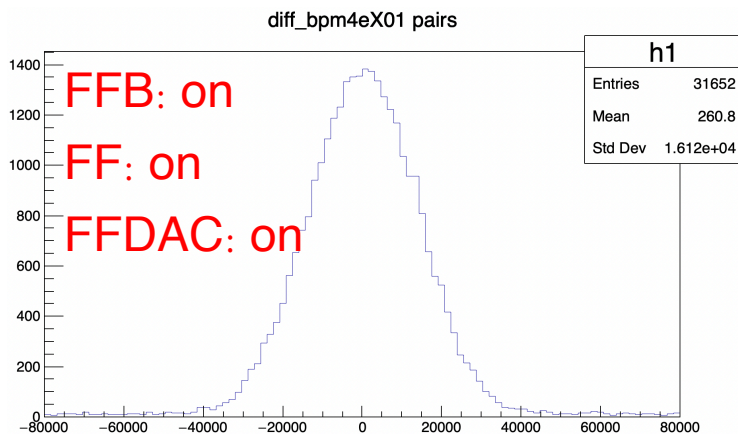
Pairs_corrected results for diff_bpm4aX



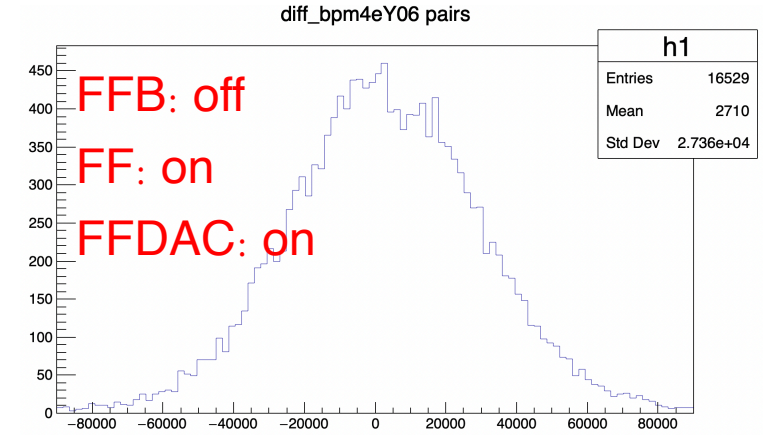
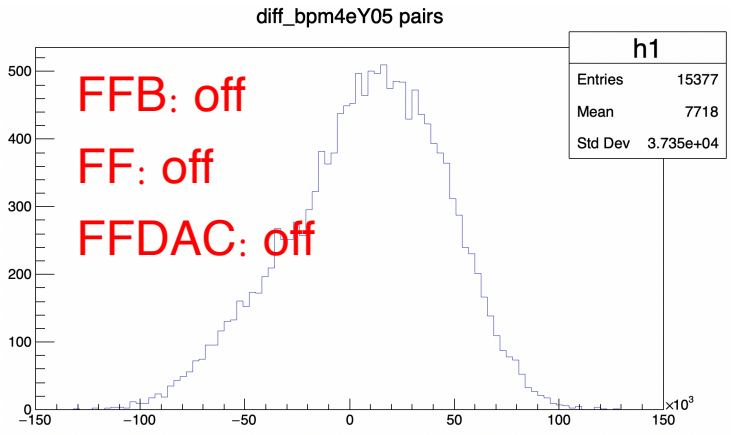
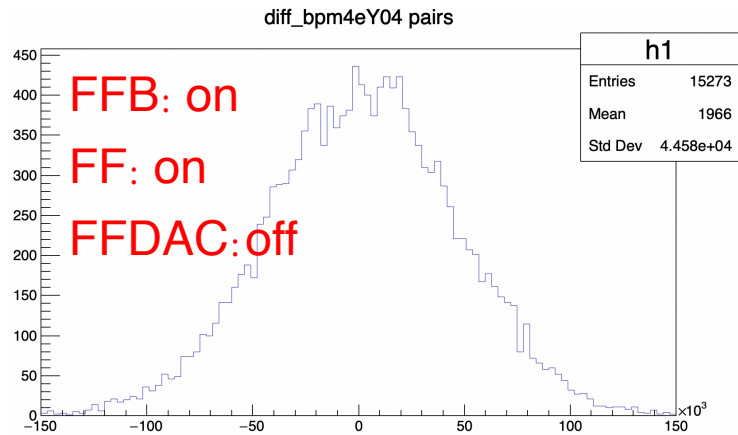
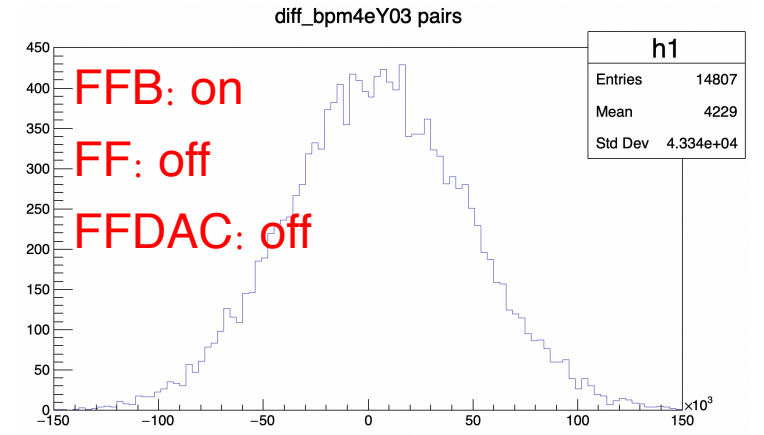
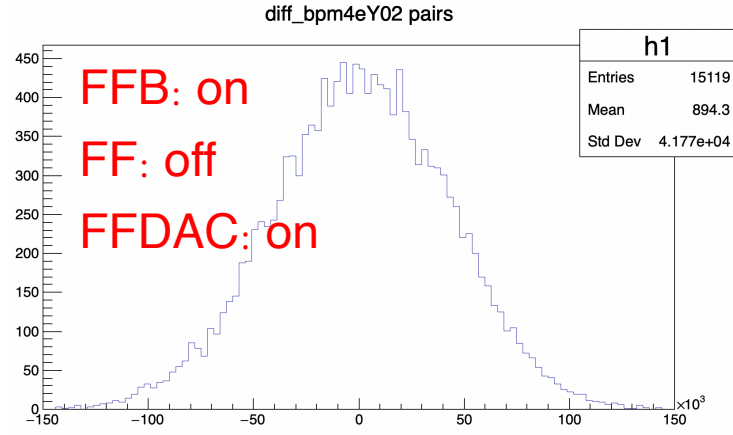
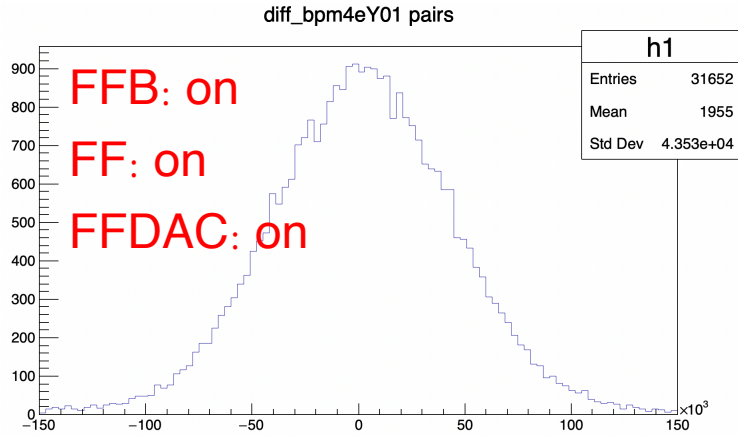
Pairs_corrected results for diff_bpm4aY



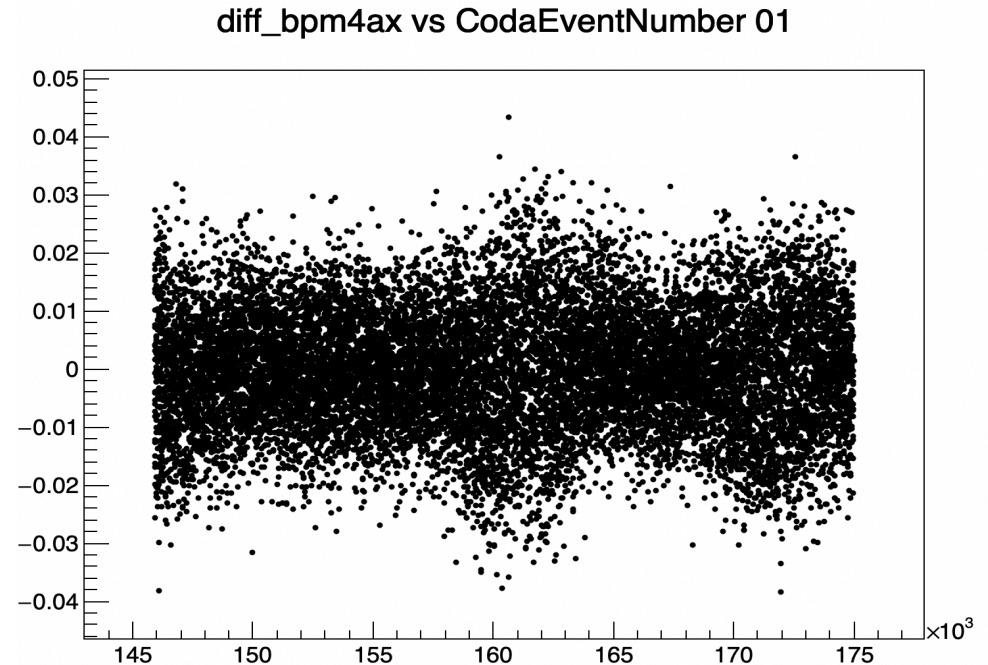
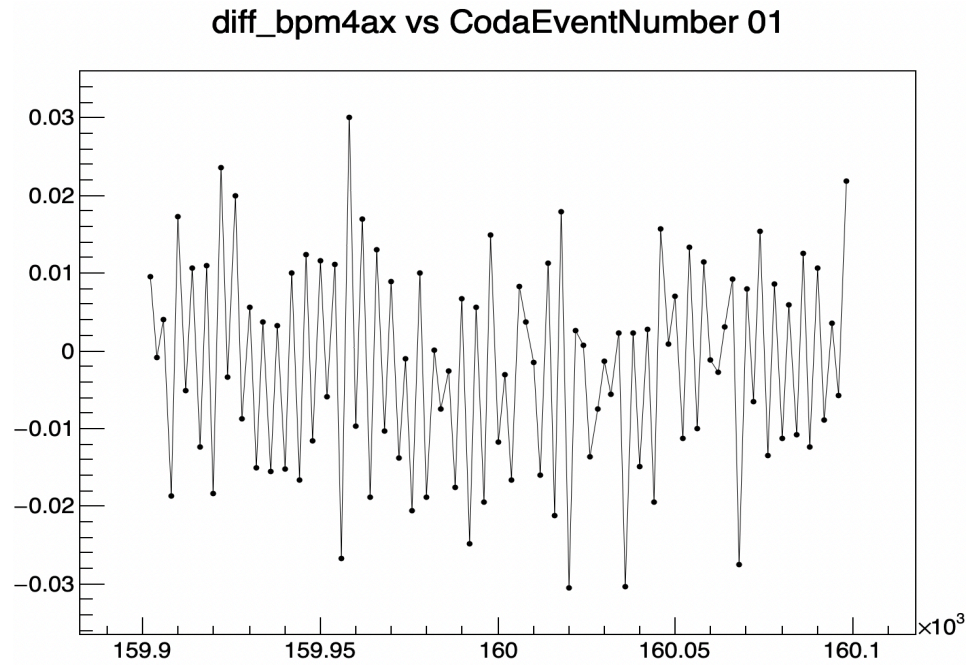
Pairs_corrected results for diff_bpm4eX



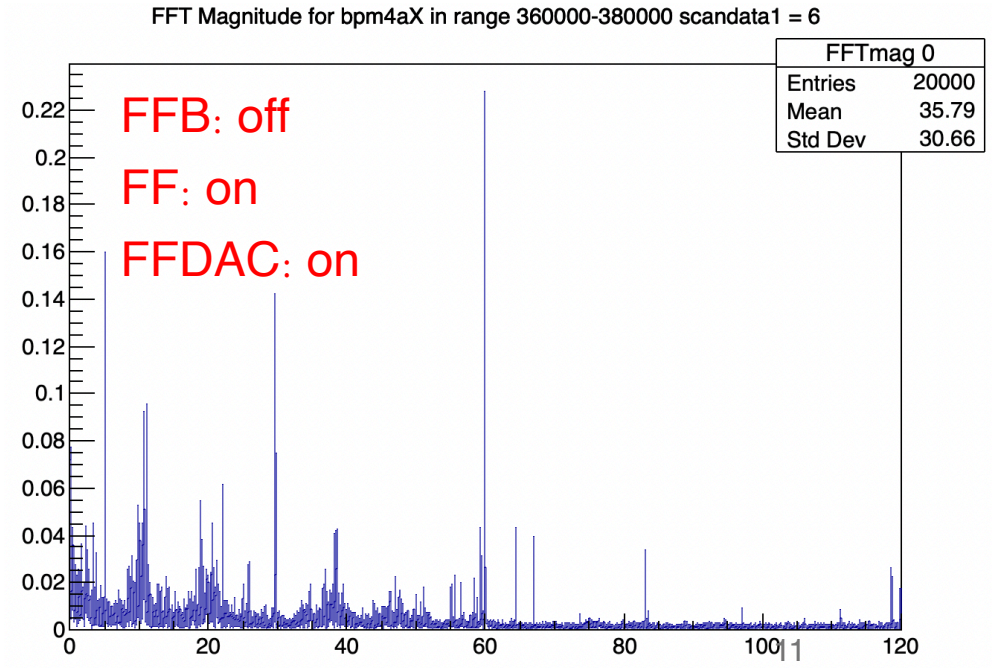
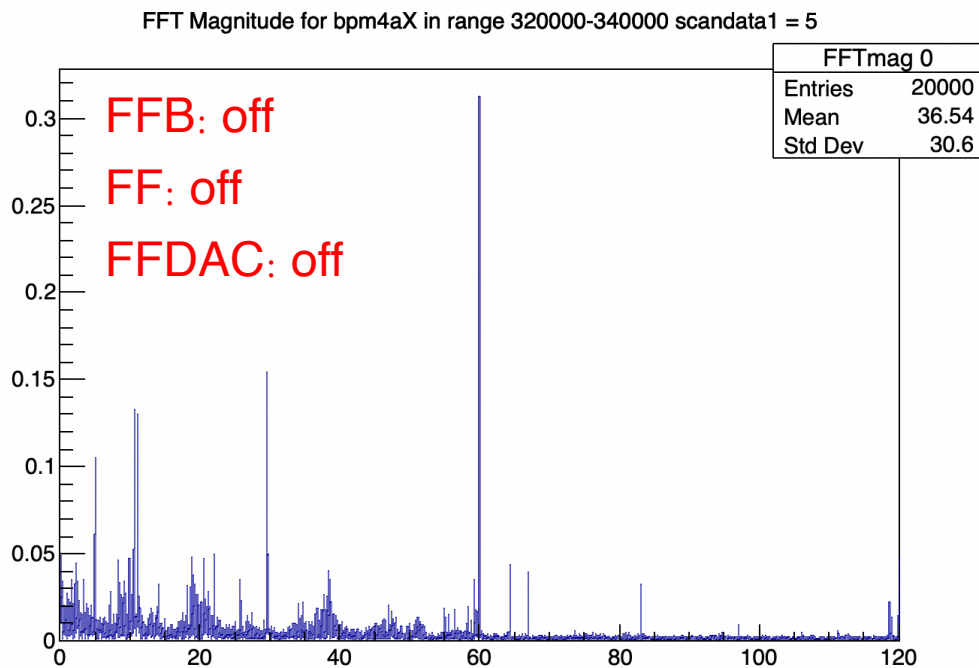
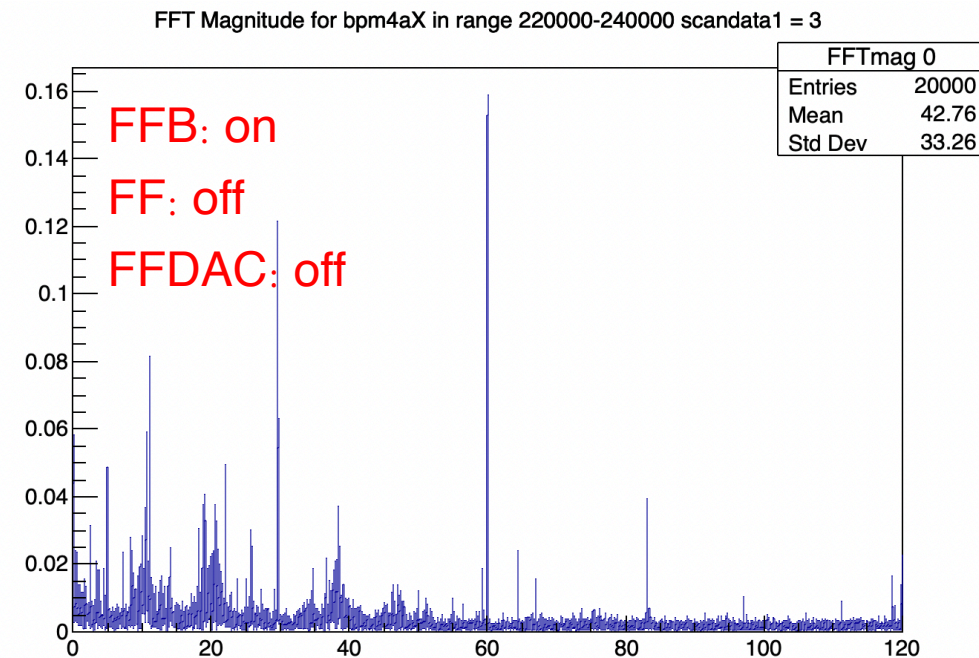
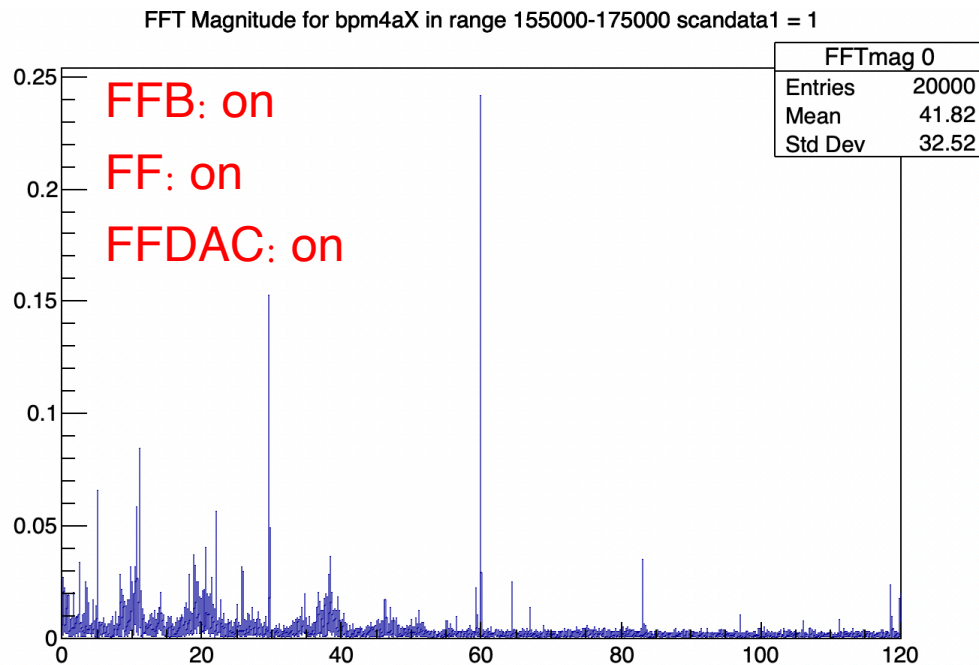
Pairs_corrected results for diff_bpm4eY



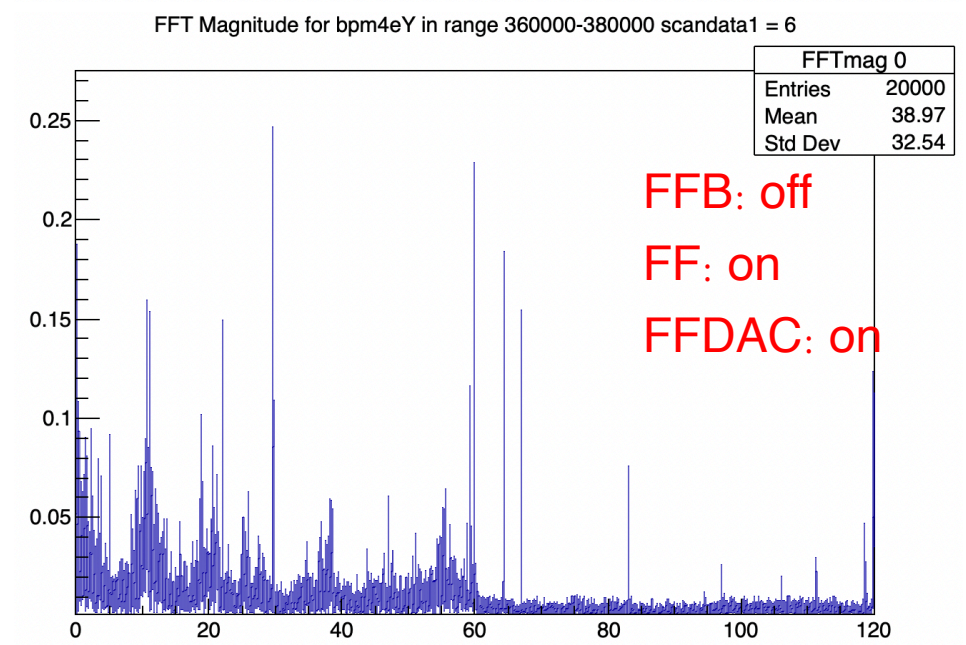
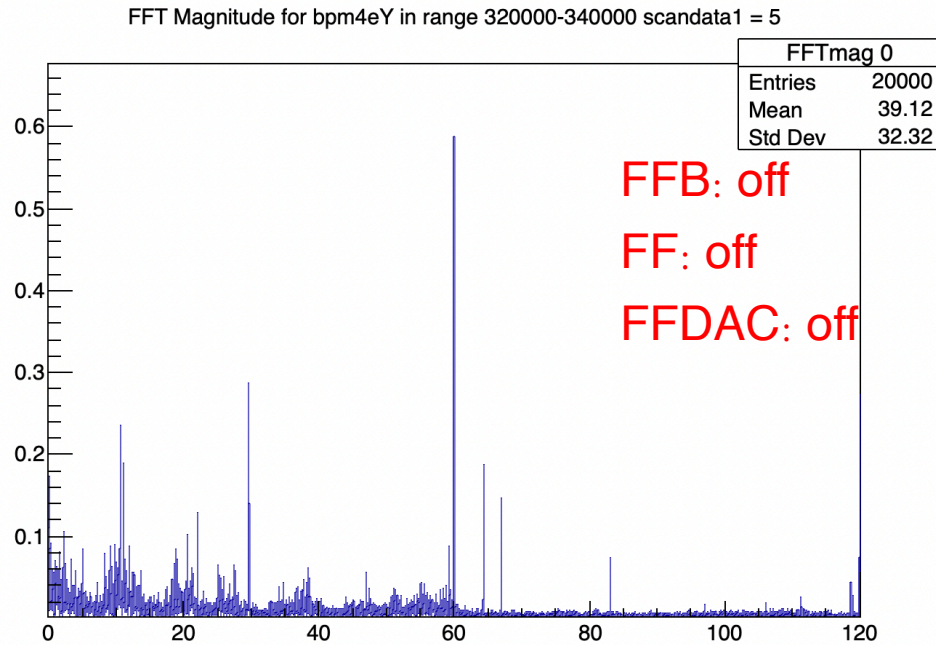
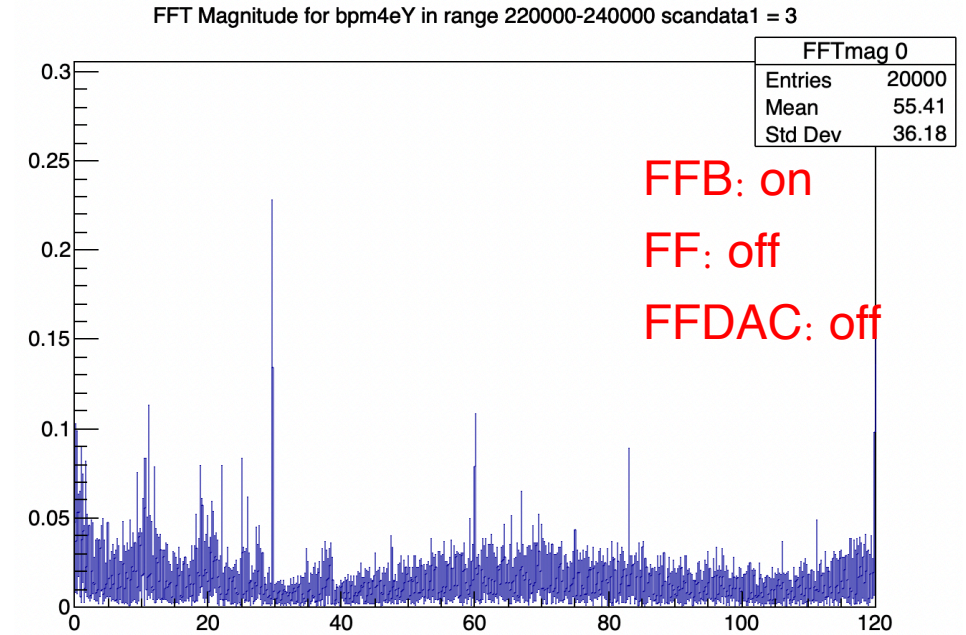
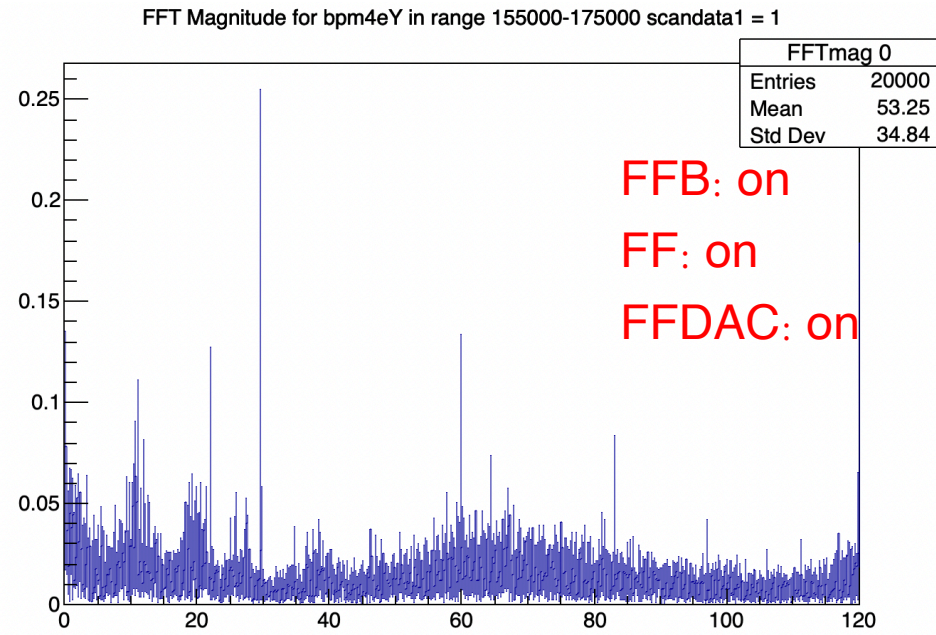
Here are plots for the pair-wise diff_bpm4aX_(1-2.0*actual_helicity) results vs CodaEventNumber with FFB on FF on and FFDAC on which can tell us the frequency is around 240 Hz but we can see in the left plot there are some points didn't follow the pattern



FFT histograms for bpm4aX

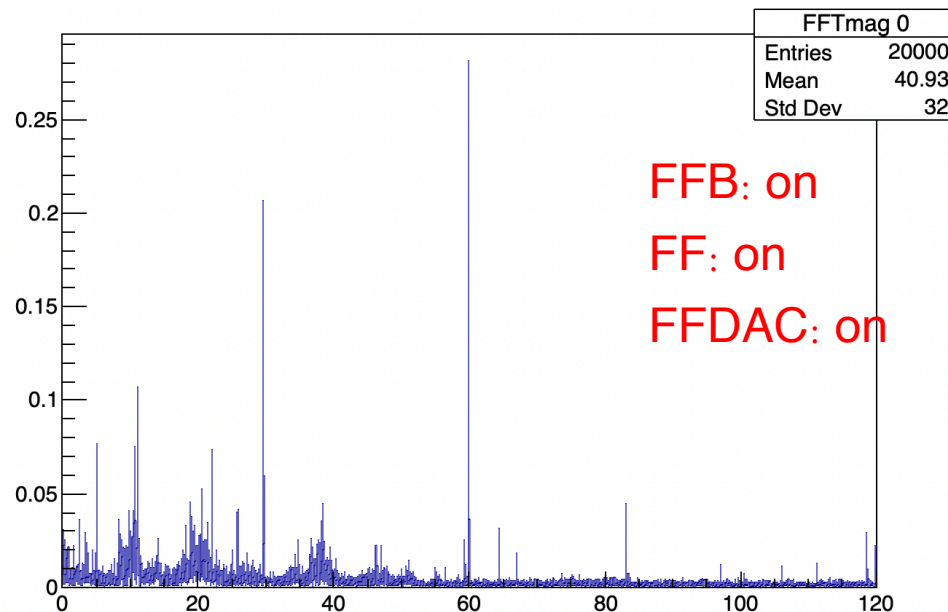


FFT histograms for bpm4eY

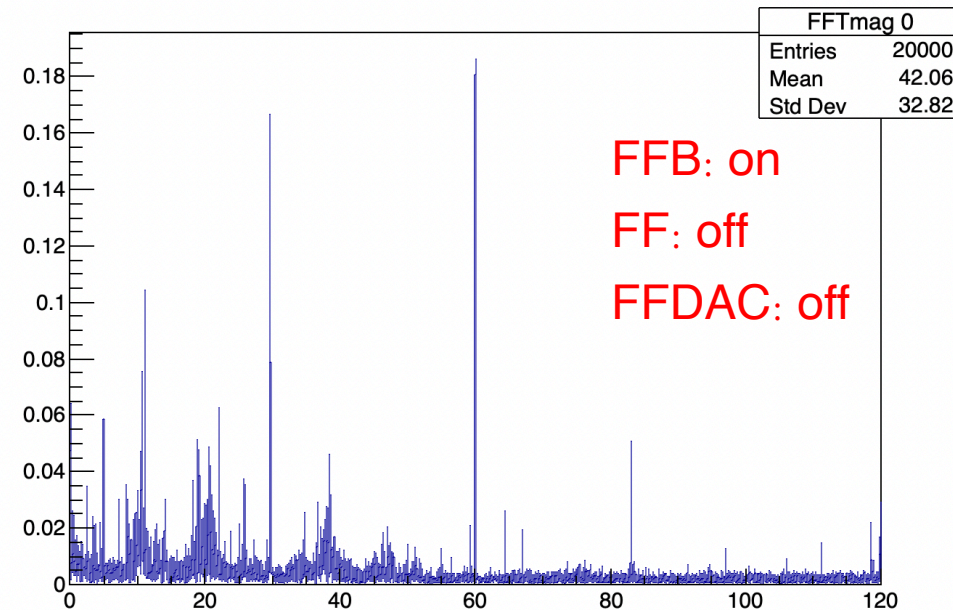


FFT histograms for bpm4eX

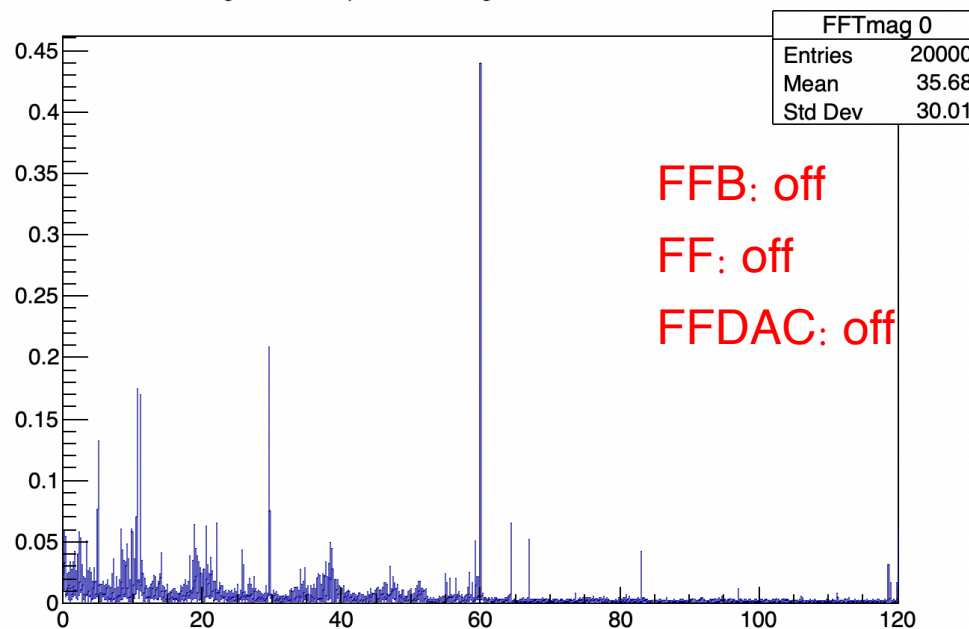
FFT Magnitude for bpm4eX in range 155000-175000 scandata1 = 1



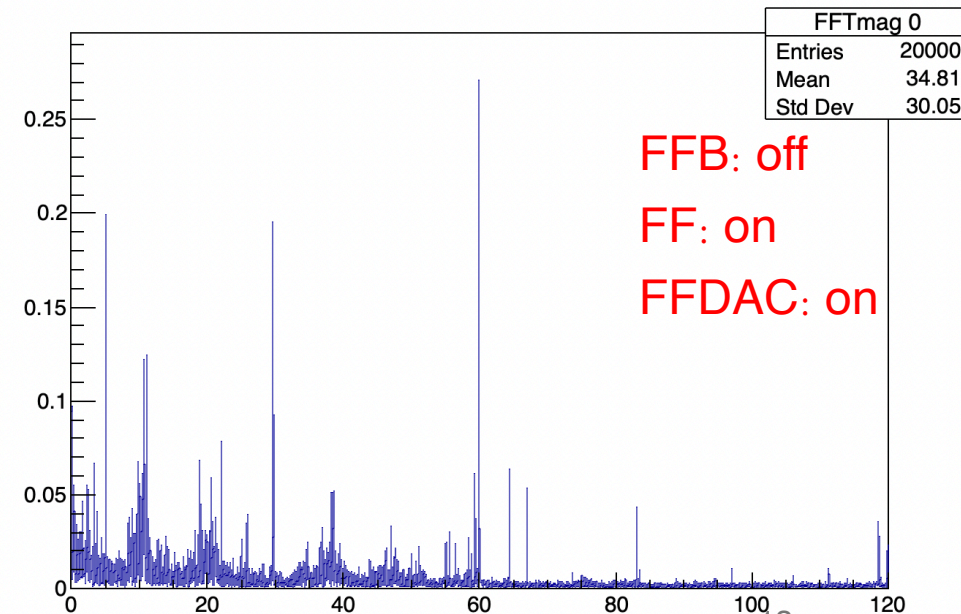
FFT Magnitude for bpm4eX in range 220000-240000 scandata1 = 3



FFT Magnitude for bpm4eX in range 320000-340000 scandata1 = 5

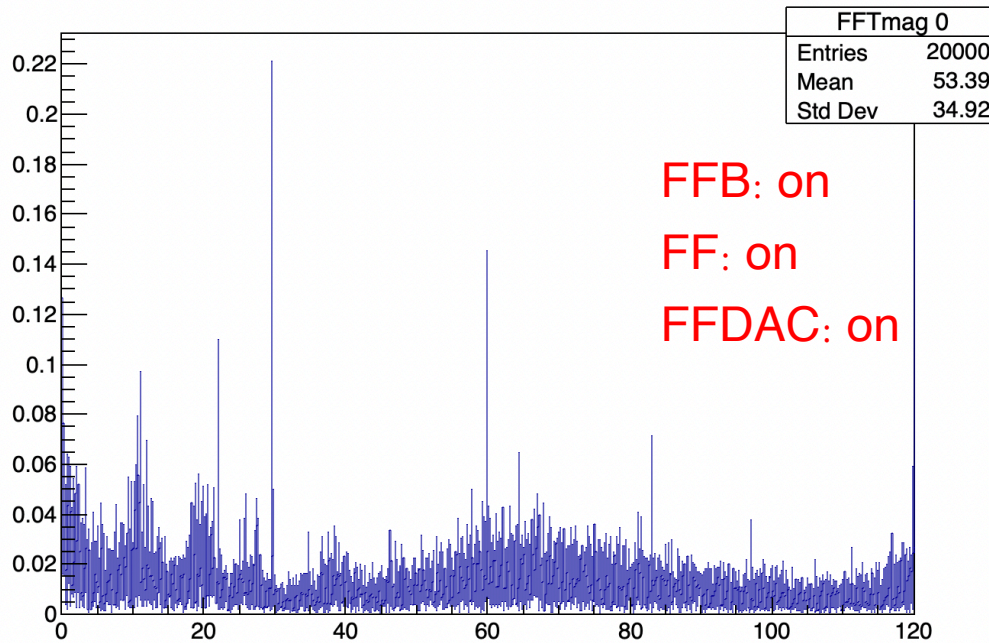


FFT Magnitude for bpm4eX in range 360000-380000 scandata1 = 6

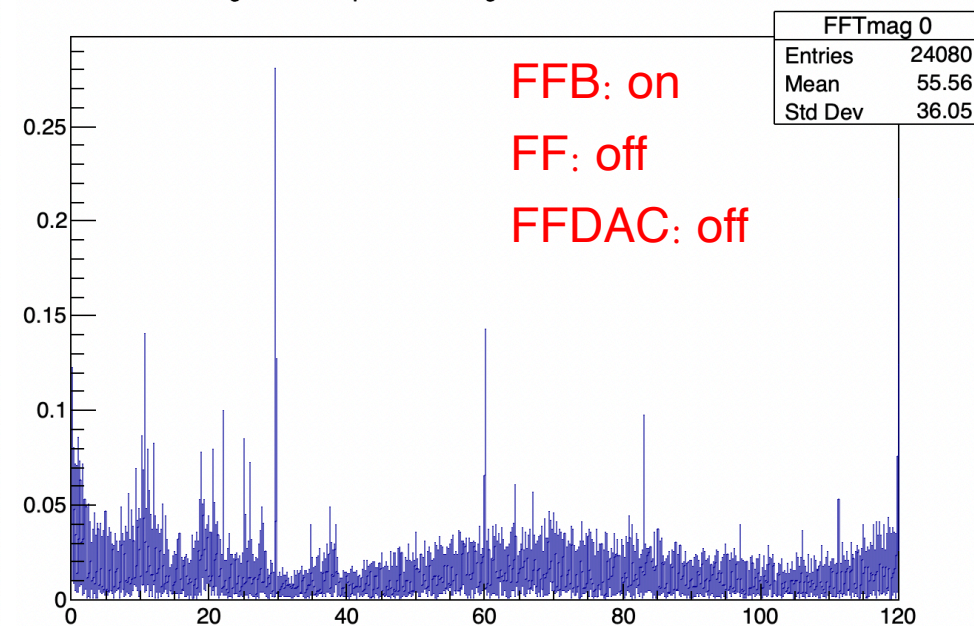


FFT histogram s for bpm4aY

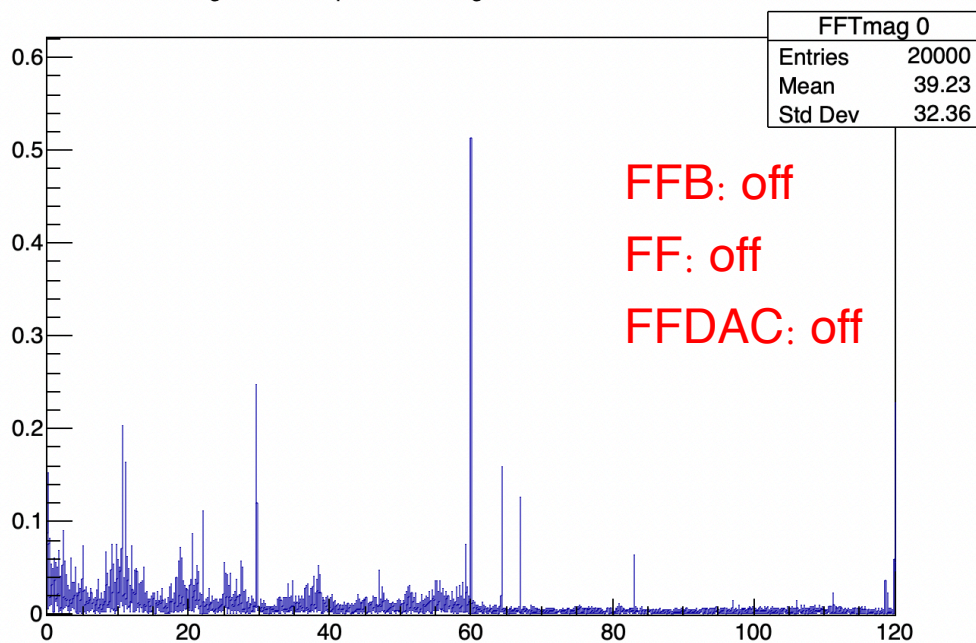
FFT Magnitude for bpm4aY in range 155000-175000 scandata1 = 1



FFT Magnitude for bpm4aY in range 220000-280000 scandata1 = 3



FFT Magnitude for bpm4aY in range 320000-340000 scandata1 = 5



FFT Magnitude for bpm4aY in range 360000-380000 scandata1 = 6

