SciFi Runlist

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2019-05-16

1 Timing tests with beam

1.1 Early timing test

2019-02-12

Run 3816 using ps5=1 (RHRS trigger), RHRS latency of 150 (and width), (LHRS has lat 205), taken with threshold mode on.

Run 3830 using ps1=ps2=1 (LHRS triggers), with LHRS latency of 205, width 100, (RHRS has lat 150), taken with threshold mode on.

These runs were had suggestive peaks for the respective arms tested, as is catalogued in logentry:

`https://logbooks.jlab.org/entry/3652013`

Both of these runs taken with HV = -750V for SciFi.

sieve slits were inserted.

Run_number	Left-Lat (wid)	Right-Lat (wid)	Triggers	Comment
3816	205	150 (150)	ps5=1	Threhold mode
3830	205 (100)	150 (150)	ps1=ps2=1	

1.2 Follow up test (trigger timing for both arms changed slighlty)

2019-02-17

Run 4119 with ps1=ps2=ps3=ps4=ps5=ps6=1

Run 4120 with ps2=ps5=1

No Clear timing peak seen for either arm. Not ran in threshold mode, with all samples being taken.

LHRS latency = 205, LHRS wid = 100, RHRS latency = 150, RHRS wid = 100

Sieve OUT

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Documented in logbook:
`https://logbooks.jlab.org/entry/3655221`

Run_number	Left-Lat (wid)	Right-Lat (wid)	Triggers	Comment
4119	205 (100)	150 (150)	ps1,2,3,4,5,6=1	
4120	205 (100)	150 (100)	ps1=ps2=1	

1.3 First check with S0 connected to SciFi input (LHRS)

2019-02-18

These tests were taken with cosmics as the idea was to test the propogation of signals from where they were read out (shieling hut) to the SciFi detector's location (next to the target).

First test: connected S0 channels to SciFi slot 10, channels 14 and 15, with S2 trigger. LHRS latency set to 201 and signals detected / 12 samples in. Run 4138.

Documented here:
`https://logbooks.jlab.org/entry/3655544`

Second test: S0 signal sent down towards location of SciFi to test time of propogation of signal from SciFi to shielding hut (where DAQ set-up is). LHRS SciFi now with latency of 96. Signal seen at / sample 14. This was run 4141 (S0 channels still connected to same SciFi slots as above). (Runs 4139 and 4140 were taken under the same conditions but run 4139 had LHRS lat = 64, and run 4140 has lHRS lat = 84 and neither saw signals from the S0 channels.)

Documented here:

`https://logbooks.jlab.org/entry/3655567`

A prediction for SciFi timing was then made with the difference between SciFi and S0 signals determined to be 89ns/ 22 samples, and the new latency for the left SciFi as 180. Run 4141 (run 4139 had LHRS lat = 64, and run 4140 has lHRS lat = 84 but neither saw signals from the S0 channels). 4

Documented here:

`https://logbooks.jlab.org/entry/3655586`

Run_number	Left-Lat (wid)	Right-Lat (wid)	Triggers	Comment
4138	201	150 (150)	ps1,2,3,4,5,6=1	S0 $\rightarrow$ L-SF s10:ch14,15
4141	205 (100)	150 (100)	ps1=ps2=1	S0 $\rightarrow$ L-SF s10:ch14,15

1.4 Timing test with new latency (for LHRS = 180)

2019-02-21

New run taken whilst only LHRS dipole was operational with LHRS SciFi latency of 180. This was taken in 'raw mode' and replayed with different levels of 'threshold' in order to find timing. A suggested peak was found at $\sim$ 6 samples, or 24 ns but was not clearly present in all channels. Run 4177

This was documented here:

`https://logbooks.jlab.org/entry/3657285`
`https://logbooks.jlab.org/entry/3657354`

Run_number	Left-Lat (wid)	Right-Lat (wid)	Triggers	Comment
4177	-	180	-	-

1.5 Set of timing tests for left arm (with beam)

2019-03-08

Multiple runs described well in log entry below. Runs with sieve in, designed to scan latency to find peak. Run 4640 found suggested peak with latency 300 (and width 200) at $\sim$ 180 samples such that runs 4641 - 4644 were taken with latency 192, width 40.

All of these runs were taken with target V1, x = 2.2 (beam position), 2*2 raster and ps1 = 1. Current was varied and documented in logbook below.

`https://logbooks.jlab.org/entry/3664676`

Run_number	Left-Lat (wid)	Right-Lat (wid)	Triggers	Comment
4640	300	108	ps1=1	
4641	192	108	ps1=1	
4642	192	108	ps1=1	
4643	192	108	ps1=1	
4644	192	108	ps1=1	

1.6 Comparison of Left and Right arm SciFi cosmics timing

Comparing cosmics run 4623 and 4624 to find timing difference between arms is $\sim$ 78 samples/ 313 samples. Documented here:

`https://logbooks.jlab.org/entry/3666210`

Run_number	Left-Lat (wid)	Right-Lat (wid)	Triggers	Comment
4623	130	150	ps7=1	Long cosmics run
4624	130	150	ps7=1	Long cosmics run

1.7 Test of Right arm timing

2019-03-11

4778. RHRS SciFi timing test taken with Latency 150, width 100 and a prediction of peak at $\sim$ 55 channels in that was unfound (no peak found).

V1 target with x = 2.7, y = 1.8, raster = 1.5*1.5,I = 1 A, sieve OUT, SciFi HV = -700V,

Documented in the logbook:

`https://logbooks.jlab.org/entry/3666438`

Run_number	Left-Lat (wid)	Right-Lat (wid)	Triggers	Comment
4778	192	150 (100)	ps4=1	

1.8 Comparison of Left and Right arm timing (with idea that LHRS peak was found)

2019-03-14

Using two methods to try and deduce the correct latency for the RHRS SciFi.

- Firstly using the difference in the timing peaks for cosmics (4623 & 4624, detailed in 1.6) and with beam (as in 4662) for the LHRS (supposedly established) and the established timing peak for cosmics in the RHRS (again 4623 & 4624) to deduce the correct timing and latency for runs with beam in the RHRS (as in 4778, detailed in 1.7), this results in a timing peak of 35/36 samples if 150 latency is used.

- Second method uses earlier results with threshold (as in 1.1) which are similar to later established left-arm results, with idea this will be true for RHRS SciFi also. This results in a signal in sample 36 if latency of 150 is used.

Documented here:

https://logbooks.jlab.org/entry/3667752

1.9 Final testing of right-arm timing

2019-03-17

Runs 4967 and 4968 taken with latency 300 (4968 hv was off, results invalid).

Latency set to 150 for runs 4969-4971. All runs had sieve out and HV = 700V.

No clear timing peak was found, results and specifics of runs are catalogued in logbook:

https://logbooks.jlab.org/entry/3669014
https://logbooks.jlab.org/entry/3668987

Run_number	Left-Lat (wid)	Right-Lat (wid)	Triggers	Comment
4967	192	300	ps4=1	Long cosmics run
4968	192	300	ps4=1	Long cosmics run
4969	192	150	ps4=1	Long cosmics run
4970	192	150	ps4=1	Long cosmics run
4971	192	150	ps4=1	Long cosmics run