

Physics Energy distribution(5)

2019 Summer Work

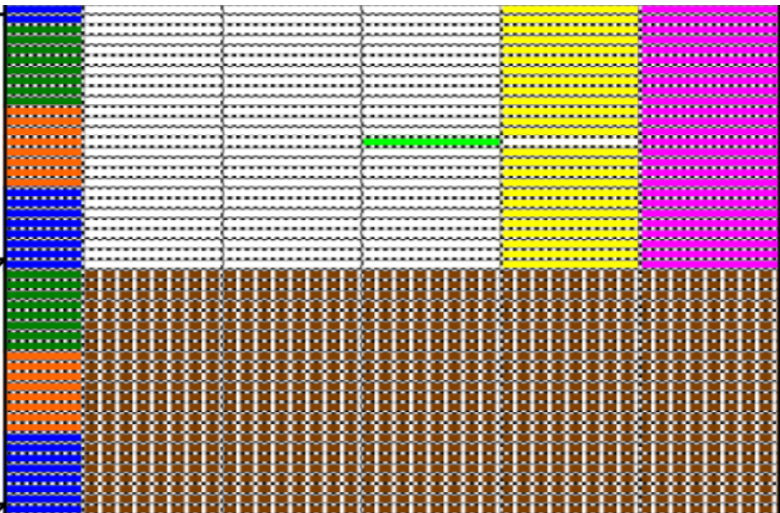
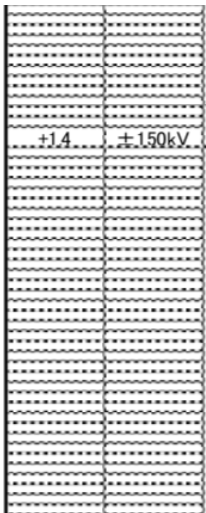
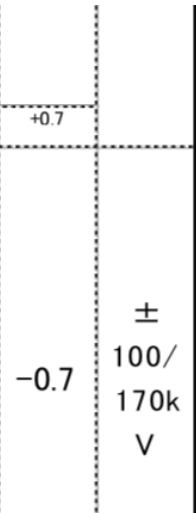
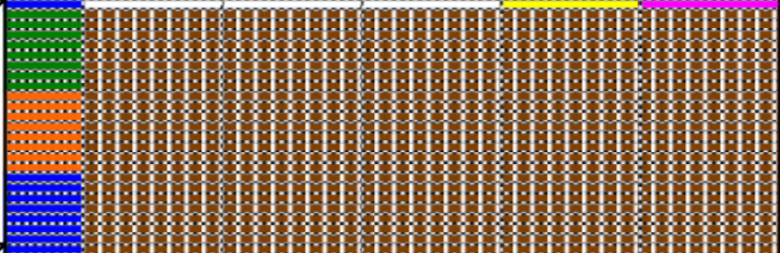
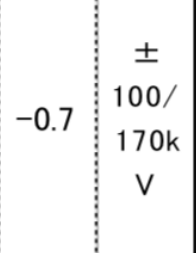
FEB.

13	Wed	MLF/HD	50mA, 0.2–0.5ms, 50–489ns, 1–shot, 25Hz/5.2s	Cooling water trouble 16:14 – 22:21 [6h]	K1.8→K1.8BR 9:02 K1.8BR→K1.8 16:14	There is no good run.				±150kV	±	100/170k
14	Thu	Maintenance	50mA, 0.05–0.5ms, 50–489ns, 1–shot, 0.2Hz/1Hz/2.5Hz/25Hz/5.2s	maintenance 9:00–						±150kV		
15	Fri	MR/MLF/HD	50mA, 0.2–0.5ms, 50–489ns, 1–shot, 25Hz/5.2s	maintenance /Acc tuning 6:57 – 10:07	HD tuning 10:07 – 11:11						±	100/170k
16	Sat	MLF/HD	50mA, 0.2–0.5ms, 50–489ns, 1–shot, 25Hz/5.2s	SDB 12:22 – 16:11[4h] SDB 23:58 –	K1.8BR→K1.8 0:07							

MARCH

8	Fri	MLF/HD	50mA, 0.2–0.5ms, 50–489ns, 1–shot, 25Hz/5.2s	Septum board repair – 8:19 /Acc tuning – 10:18	HD tuning 10:18 – 10:46 K1.8BR→K1.8 14:06							
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13	Wed	MLF/HD	50mA, 0.2–0.5ms, 50–489ns, 1–shot, 25Hz/5.2s	klystron6 – 0:27	K1.8→K1.8BR 21:00							
14	Thu	Maintenance	50mA, 0.05–0.5ms, 50–489ns, 1–shot, 0.2Hz/1Hz/2.5Hz/25Hz/5.2s	maintenance /Acc tuning 21:12 – 22:46	HD tuning 22:46 – 23:27						±	100/170k

17	Sun	MLF/HD	50mA, 0.2–0.5ms, 50–489ns, 1–shot, 25Hz/5.2s		K1.8BR→K1.8 12:16 K1.8→K1.8BR 13:21 (K1.8 1 hour)			
18	Mon	MLF/HD	50mA, 0.2–0.5ms, 50–489ns, 1–shot, 25Hz/5.2s	B15D trouble 0:54–				

From log note

9:02 Run 30157 stopped $\odot$.

Settings of momentum of K1.8 was done.

Beam will come.

Feb 13

15:52. Run 30172 stopped.

Beam stopped.

K1.8 tuning,

momentum : $0.7 \text{ GeV}/c$

15:56. Run 30173 started.

12:50 Started Run 30231

13:12 Call from HD shift. ^(Sat) K1.8 will change their magnet setting as:
K1.8 $-0.7 \text{ GeV}/c \rightarrow +0.7 \text{ GeV}/c$

13:13 Stopped Run 30231.

Feb 15 13:17 Beam returned.

13:17 Started Run 30231.

13:27 ended.

13:28 start run 30232 (physics)

From log note

1855 < Plug open >>
Run 30247 [Physics] started. → ended 19:42

19:24 BHCV HV I leak @ off spill
| mod 0 2.75kV ~ 0 μ A
| mod 1 2.6kV ~~0.16~~ 0.16 ~ 0.2 μ A
| mod 2 2.75kV ~ 0 μ A

19:42 Call from
HP Shift : K1.8BR will change the momentum.
+0.7 GeV/c → -0.7 GeV/c

19:53 < Plug closed >>
→ try again MUON run w/ cosmic ray counter.

Run 30248 X failed.
• Jay notified the code
in which special treatment
for MUON run was
hard-coded.

19:58 Run 30249 MUON run
20:29 ended.
about delta-veto-pattern.

Feb 16, 2019 (Sat)

00:10 Beam stop to change magnet setting
from 0.7 GeV/c to +1.4 GeV/c

Feb 15

Feb 16

From log note

18:19 Run 30326 started.
 ended
 19:03 Run 30327 started
 ended
 19:31 ended

(Change comment from "Physics - DARTest" to "Physics", but nothing changed in between)

19:13 call from NDSC
 KL.P.D1 param will be changed ~~at~~ ~15 min. later

MD scaler: 2.09M/spill
 IB scaler: 0.91M/spill

[KL.P] 19:31 Beam stopped
 to change KL.P momentum.
 19:36 Beam is back. $+1.4 \text{ GeV/c} \rightarrow +0.65 \text{ GeV/c}$
 19:36 Run 30328 started..

MB scaler: 1.41M/spill
 IB scaler: 0.62M/spill

Feb 16

20:26 Run 30329 started.
 ended
 20:54 300 spills

(call from NDSC
 KL.P.D1 param will be changed
 ~10 min later)

[KL.P] 20:55 Beam stopped to change KL.P momentum
 $+0.65 \text{ GeV/c} \rightarrow +0.6 \text{ GeV/c}$

20:58 Run 30330 started.
 21:44 ended

MB scaler: 1.37M/spill
 IB scaler: 0.62M/spill

From log note

174

Feb 16, 2019 (Sat.)

Physics run
cont'd.

22:02 Beam stopped to change K1.8 momentum
K1.8 $+0.6 \text{ GeV/c} \rightarrow -1.32 \text{ GeV/c}$.

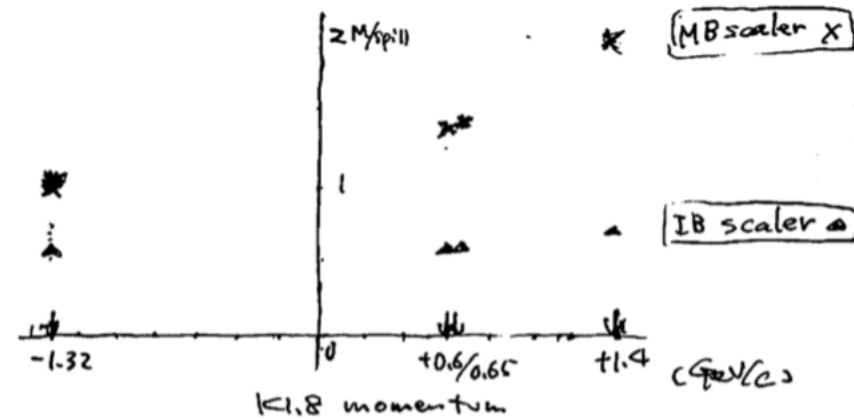
22:07 Beam is back.

22:07 Run 30332 started
22:51 ended

MB scaler: 1.09 M/spill
IB scaler: 0.57 M/spill

		K1.8 momentum			
		+1.4 GeV/c	+0.65	+0.60	-1.32
MB scaler	2.00	1.41	1.37	1.09	M/spill
IB scaler	0.71	0.62	0.62	0.57	
	Run 30329	Run 30328	Run 30330	Run 30332	

Feb 16



22:52 Run 30333 started
23:36 ended

From log note

Feb 19

17:30 run 30436 started

Shift meeting

meeting
K1.8 magnet configuration : -1.32 GeV/c ~~when~~ ^{before} will be mainly used ~~at~~ middle of March
will change ^{positive} ~~pos~~ momentum 6-8 hours just ~~before~~ the next maintenance
will ~~also~~ use $\approx$ 3 hours just after every maintenance then.
will use positive ^{momentum} configuration from middle of March

Feb 21

Cosmic data taking

Q=14 Run 30501 started.

9.24 KL D1 magnet off. 9.24'
(T. N. 2000)

9:32 Run 30501 stopped

 $a = 15$

- KL area open
- Fence door open
(T. Nommally)

CAEN ~~note~~
Crate 4 unreachable.
(from Zam)
(Mani)

From log note

Feb 22

2/22/2019

19:05 BHCV module 1: High current alarm.

Lowered HV to 1.5 kV.

19:28
25

D1 magnet was turned on. (Shiomi + Kotera)

2/22/2019

20:00

Started Run 30551

~~Beam~~ Downstream: Same as ~~before~~ yesterday

14.8 -1.32 GeV

DAQ does not work.

From log note

Feb 22

224

2/22/2019

HD will set downstream magnet setting to new parameters, and ~~set~~ ^{try} K1.8 ~~map~~ settings to check that protons hit the beam dump

20:34 runDBCapture.sh
pll-reset

crate 8 has error

pll-reset on crate 8 only

no error, but ET OFC alignment error

20:44 pll-reset: top CDT only.
crate 6 and 7.

pll-reset crates 6 & 7.

20:43 Jay came in.

Still, ET OFC alignment error

lds/
tcdt-lds-rx-debug.sh

4099

20:50 Call from Nomura. Continuous beam for users starts.
K1.8: +1.46 GeV/c.

21:25 Jay + Kotera will go downstairs.

21:43 Call from HD. K1.8 will change the momentum in ~10 min.

22:02 K1.8 will change to +0.65 GeV/c

22:05 Beam returned

23:05 Jay came back.

Call from HD.

~15 min

Primary BL $\odot$ magnet parameters
(downstream of T1 target)
[2.185 GeV] (2.19 Feb by yesterday) [This time]

Q1B	810A	418A	827A
Q1C	742A	491A	942A
Q1D	529A	418A	529A

Steering magnet parameters are
(H18, V19) all same
* H18 depends on K1.8 momentum

225

2/22/2019

23:15 Started Run 30560

Stopped

TMON

bypassing crate ϕ & 10, to see scalar rates w/ K1.8 = 0.65 GeV/c

, took scalar rates. $\rightarrow$ p.221

23:20 Opened beam plug

23:20 Started Run 30561 Physics

23:23: Call from HD. K1.8 will change p from +0.65 GeV/c to +0.60 GeV/c

23:23 Beam ~~was~~ is stopped.

23:25 Beam returned

23:27 Started Run 30562, physics, bypass crates 0 and 10
scalar rates (partial) $\rightarrow$ p.221

23:33 Closed beam plug

23:33 Started Run 30562

scalar rates $\rightarrow$ p.221

23:37 DAQ debugging started.

Feb. 23, 2019

0:05 Jay and Taku go to EL area and try to

- re-download firmware to ADCs crate 0, slot 4
crate 10, slot 3
- if not solved, replace them

0:29 K1.8 momentum
+0.60 $\rightarrow$ -1.32 GeV/c

0:44 Jay & Taku returned.

+0.65 GeV/c to +0.60 GeV/c

From log note

Feb 24

17:00 Nomura san went to HD hall and would
try to close KL area, and ~~to~~ turn on KL D₁
magnet.

17:09 Turn on KL D₁

Mar 1 2019 / 3 / 1

9:32 Phone call from Watanabe

Momentum setup of K_LS : +0.65 GeV/c
Targeting was finished

9:35 DI on. (Nomura)

1. 9:35 User beam started

From log note

2019 / 3 / 1

K1.8 momentum: $+0.65 \rightarrow +0.6 \text{ GeV/c}$.

Mar 1

11:10 HD Beam started

11:10 Run 30791 started (DVU)

11:55 Run 30792 started (DVU)

12:23 Call from HD: K1.8 momentum setup will be changed after 10 min.

12:27 Run 30792 stopped To change magnet setting for K1.8

10:34 $+0.6 \text{ GeV/c} \rightarrow -1.32 \text{ GeV/c}$ for K1.8

10:34 User Beam re-started

10:34 Run 30793 started (DVU)

Mar 8

14:19: ^{K1.8} plan
~~plan~~ ~~plan~~ $+0.6 \rightarrow +0.65$
magnet momentum; $+0.65 \rightarrow +0.6 \text{ GeV/c}$

From log note

Mar 8 15:21 KL1.8 change P to 0.6 GeV/c

Beam stops

run 31043 stops

15:24 run 31044 starts.

16:27 Call from Had. Shift
KLS will change beam momentum from in 5 min
+0.6 $\rightarrow$ -1.32 GeV

16:28 Beam stopped

16:28 stopped Run 31045.

Mar 13

20:51 Run 31213 started
21:02 ended 109 spills

21:02 KL1.8 $\xrightarrow{+0.9 \text{ GeV/c}}$ KL1.8 BR (+0.9 GeV/c)
- 21:16 ($\leftarrow 1.32 \text{ GeV/c}$) The beam stopped to switch the beam line

21:17 Run 31214 started
MB rate ~

From log note

Mar 13

22:06

22:45

Run 31215 started

stopped 418 spills

22:49

- 22:49

Beam stopped to change K1.8 BR momentum
+0.9 $\rightarrow$ -0.9 GeV/c

22:49

Run 31216 started

stopped 85 spills

(MB rate)

Mar 14

2:08

Run 31221 started

K1.8 people try to change magnet settings

-0.9 GeV/c $\rightarrow$ +0.7 GeV/c

2:50

Run 31221 stopped

2:54

Run 31222 started

5:00

Run 31225 stopped because K1.8 BR will
change momentum

5:04

K1.8 BR momentum +0.7 $\rightarrow$ -0.7 GeV/c

5:05

Run 31226 started

MB 500 k/spill

From log note

Mar 14 13:22 Run 31238 starts

14:11 Run 31238 ends

14:12 Run 31239 starts

14:53 Found Kc DI was down due to over current. (The time when Kc DI was down was unknown.)

Later, expert
in HPBL group
checked the P.S.
and
no problem
was found
(19:40)
↓
we can
~~turn it~~
turn it
ON.

15:03 Run 31239 ends

15:04 Run 31240
~~Run 31239~~ starts

From log note

Mar 14

150

(March 14, 2019 (Thu))

20:12. Run 31245 stops

20:13 Run 31246 starts (cosmic)

20:15 CAEN crate 4 reset (T. Nomura)

IB101 indicated "trip"
→ No problem in online plots
→ waited for next update → "trip" disappeared.

21:05 Run 31247 started

21:15 KL DI ON

21:28. The detector bit assignment is now set for (Jay) the "Rate study". It will be valid for next run.

21:57 Run 31247 ends.

21:58 prepare rate study = DAQ test.

Run 31248 start (DAQ test)

22:00 Run 31248 ends. looks okay.

comment for rate study: "Magnet setting rate study"

22:12 DAQ spill: dummy → Beam.

22:55 (Beam) call from HDSE
HD Targeting completed.

plug is closed

Study of downstream magnet starts

22:55 Run 31249 Rate study
K1.8 DI 53A 1.4 GeV/c
10 shots

23:00 23:01 23:02 23:03 23:04 23:05
23:06 23:07 23:08 23:09 23:10 23:11

March 14, 2019

23:09 @ H18 +150A

FB		MB				IB		10 shots
ch.0	ch.16	ch.0	ch.16	ch.32	ch.48	ch.0	ch.16	
11650	8616	3122	774	8297	1126	2518	2045	

23:13 @ H18 +100A again

FB		MB				IB	
ch.0	ch.16	ch.0	ch.16	ch.32	ch.48	ch.0	ch.16
11749	8644	3233	845	8285	1129	2594	1970

23:17 setting for
K1.8 DI -0.7 GeV/c.
[K1.8 DI -258A
H18 -150A

23:25 User beam started.

FB		MB				IB		10 shots
ch.0	ch.16	ch.0	ch.16	ch.32	ch.48	ch.0	ch.16	
11916	8720	3300	795	8546	1257	2562	1996	

23:30 The detector bit assignment was set back to the usual one

end of downstream magnet study

23:30 KL DI study

Run 31250 Physics ~~run~~ run w/ KL DI magnet on

23:38 Run 31250 ends. (8x spills)

Nomura-san turns off DI-magnet

23:40 Run 31251 starts. (DI-magnet OFF)

A clear increase of scalar count can be seen.

Turn on DI-magnet

KL plug was still closed.

23:46 Run 31252 starts.

Terminate soon. Plan to study the rate with plug open

From log note

Mar 15

154

March 15, 2019 (Fri)

0:51 TMon prescale 80 → 2
0:51 Run 31259 TMON w/ plug open
1:03 Run 31260 Clock w/ plug open.

Beam Plug Close

0:14. Run 31261 ~~Clock~~ TMON w/ plug closed.
Prescale for TMON 2 → 80.

Beam Plug Open

Run 31262. physics DAA trigger rate test
move pre-scale B to A (before clustering)
for the triggers w/o CV.
→ An improvement on live ratio can be seen.
The #L2A is roughly the same (1% larger is barely seen...)

Beam Plug Close

0:30. Run 31263. MUON starts
1:52 end

Beam Plug Open

1:55 Run 31264 CSI Et

2:41 DVU Target inserted
DVU Run

2:47 Run 31265 started

2:53 Run 31266 started

Shift Summary Sheet (Run81) 2019/03/14 [1:30- / 9:30- / 16:30-]

Shift Crew	C. Liu T. Nomura
HV status	CS1, MPPC, FB, NCC, MB, MBCV, IB, IBCV, OEV, LCV, CC03, CC04, CC05, CC06, newBHCV, BHPV, BHGC
Data taking	cosmic 5.5 hrs. physics 1 hr TMON, Clock 30 min.
Memo:	- CERN CRATE 4 lost connection → reset. - HDBL downstream magnet study (effect on activities from primary beam) - Rate study w/ and w/o KL-P/magnet ON - LCV rate balance check - Test of new trigger mixing for standard "physics"

Shimizu modified the trig. type 7 (cosmic up & cosmic bottom) for DVU run, because it was not "and" but "or".
~~This is due to the~~ This settings were used to do the special test of AGPC irradiation.
In addition, masking list, was also changed
(ch10 was masked)
↓
unmasked

3:43 Run 31266 stopped because data was not increased

3:44 Run 31267 started

3:45 KL plug closed stopped

Again data was not increased.
This was due to Shimizu's mistake Shimizu wrongly masked all the channels of cosmic counters. By this mask, CDT could not receive count

To protect AGPCs

From log note

15

~~MUON~~

Test MUON Run

Run 31268 started

3:50 Run 31268 stopped

kc plug opened

3:52 Run 31269 started

4:37 Run 31270 started

Count rate of CROB ch49 looks high

5:23 ~~QD~~ DV LAL removed.

Physics

5:26 Run 31271 started

L2A 7K

6:11 Run 31272 started

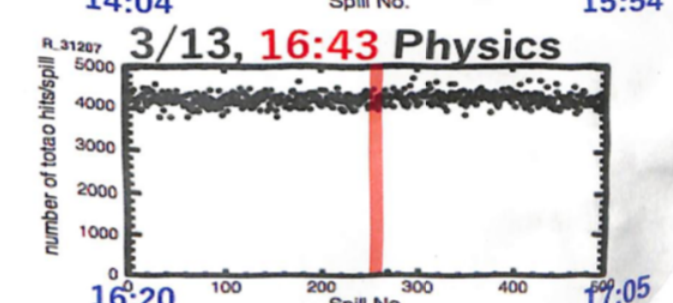
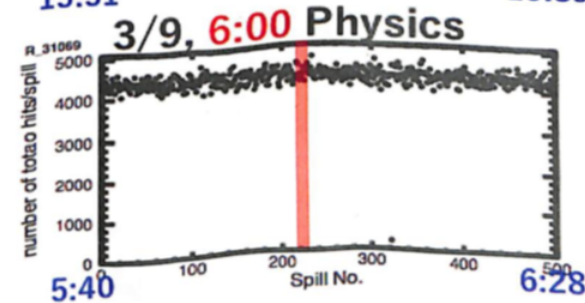
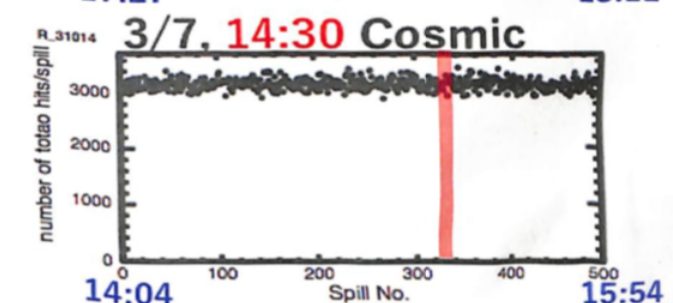
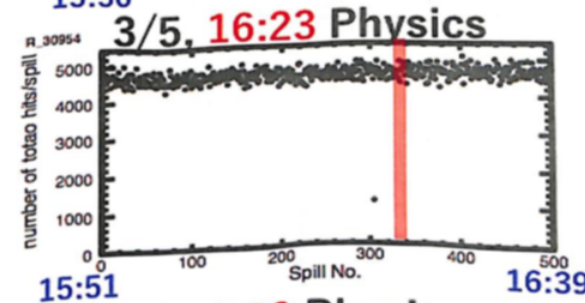
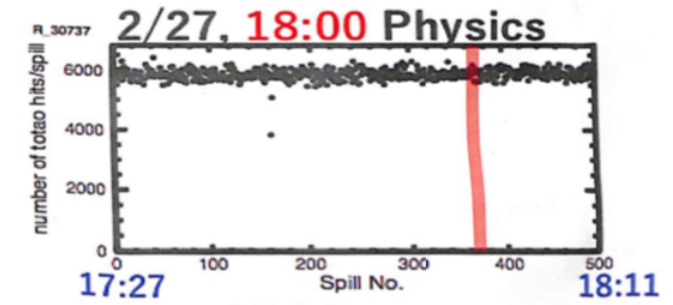
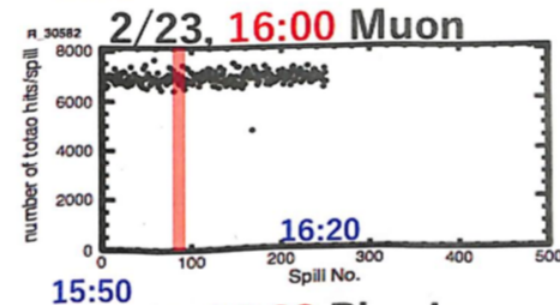
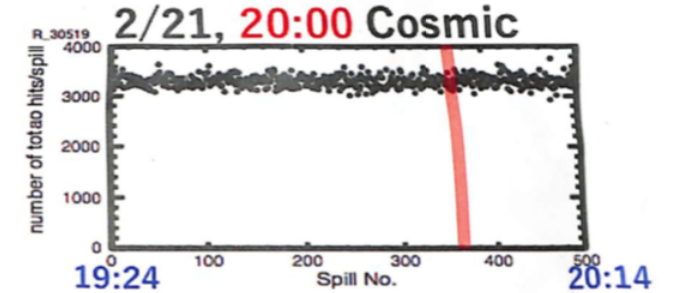
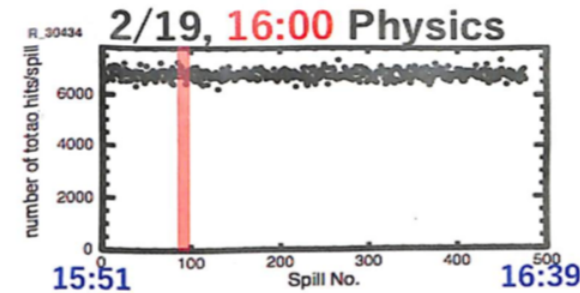
6:57 Run 31273 started

7:43 Run 31274 started

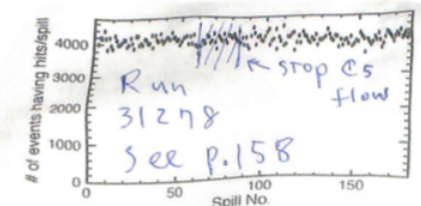
8:28 Run 31275 started

9:12 Run 31276 started

between 30952 and 30953, this increase appeared



The number of events/spill in the runs where we added pentane for the BHC. We can see the same when we take more than 2 hits or only one hit events, two hit events so we can conclude that there is no effect of adding pentane on the counting of BHC.



From log note

Mar 17

March 17, 2019 (Sun)
9:01 Run 31341 Start
9:47 ended

Physics!

Shift Summary Sheet (Run81) 2019/03/17 [1:30- / 9:30- / 16:30-]

Shift Crew	BECKERD, KOTERA
HV status	Csl, MPPC, FB, NCC, MB, MBCV, IB, IBCV, OEV, LCV, CC03, CC04, CC05, CC06, newBHCV, BHPV, BHGC
Data taking	Physics: 7h 20m Muon 30min
Memo:	

7:30 Qisen and Nomura on shift

7:47 Run 31342 stopped 107 spills Physics cont'd.

9:57 Beam stopped; KL8BR momentum $-0.7 \rightarrow +0.7 \text{ GeV/c}$

10:02 Run 31343 started ended
10:41 Run 31344 started ended
10:47 Run 31345 started ended
11:39 Run 31346 started ended
11:45 Run 31347 started ended
11:57 Run 31348 started ended
12:02 Run 31349 started ended
12:20 Run 31350 started ended
12:25 Run 31351 started ended
12:25 Run 31352 started ended
16:50 update map file of BHPV for pedestal suppression. (BHPV ch29)

during this run, no space in /home on kotodag. Remove some image files, etc. (old screen shots etc.)

pentane was added for BHCV gas (11:02 by Kotera)

March 17, 2019 (Sun)

12:16 Beam stopped to change KL8BR momentum
-12:20 $+0.7 \text{ GeV/c (KL8BR)} \rightarrow +1.4 \text{ GeV/c (KL8)}$

12:20 Run 31346 started ended Physics cont'd.

13:05 Run 31347 started stopped 173 spills

13:21 Beam stopped to change KL8/CL8BR momentum
-13:25 $+1.4 \text{ GeV/c (KL8)} \rightarrow -0.7 \text{ GeV/c (KL8BR)}$

13:25 Run 31348 started ended

14:00 Run 31349 started ended

14:54 Run 31350 started ended

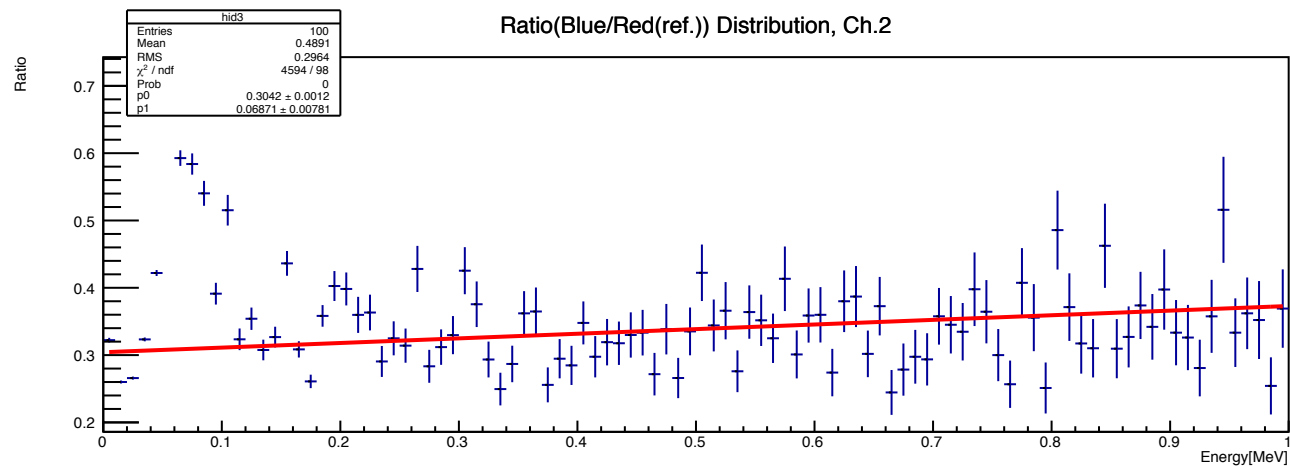
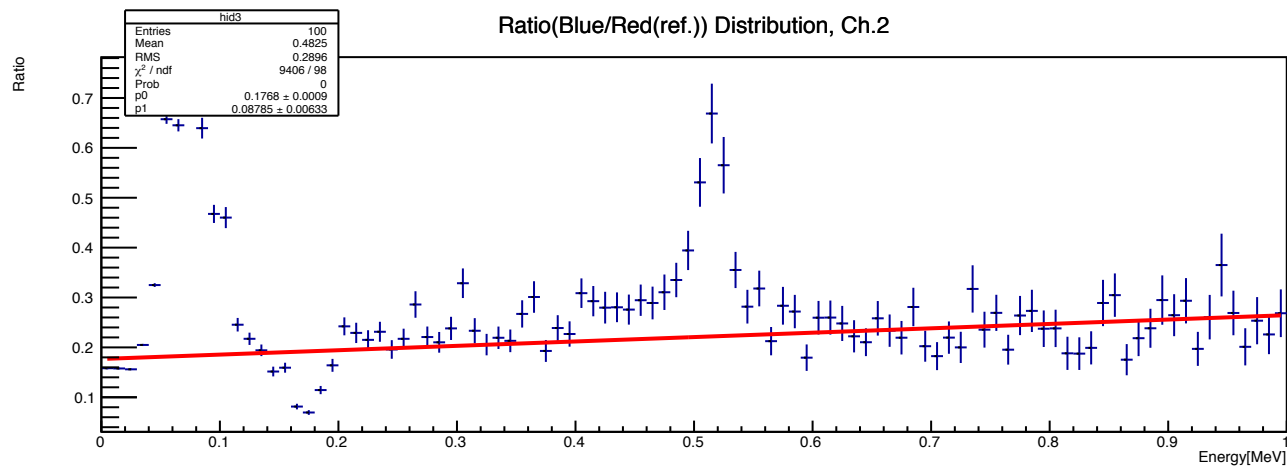
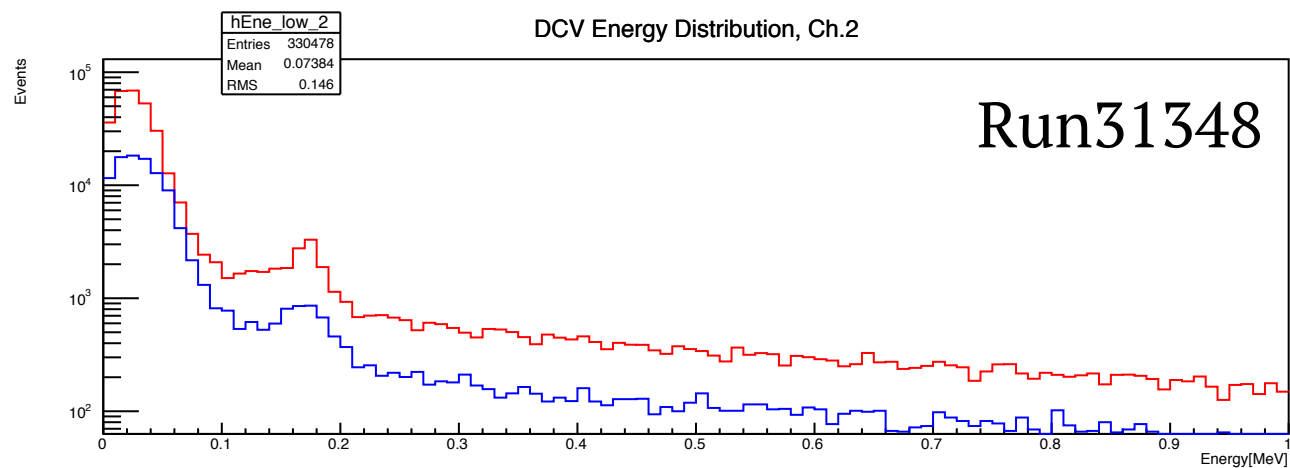
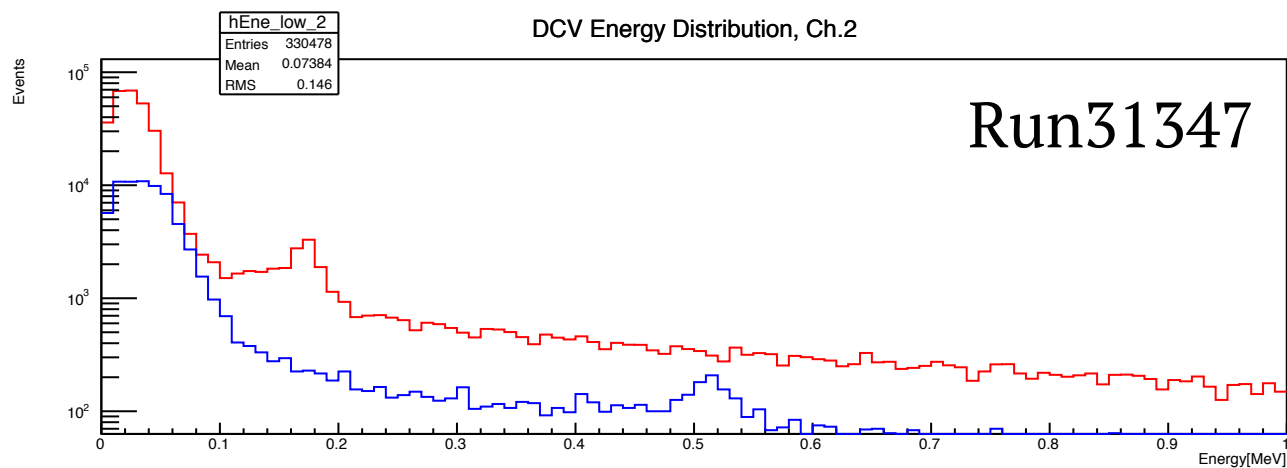
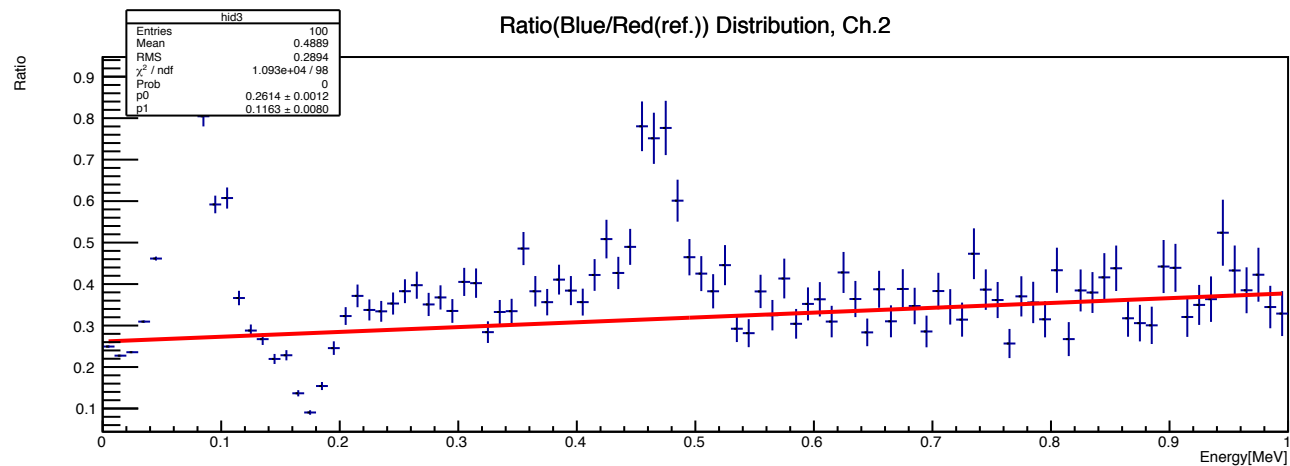
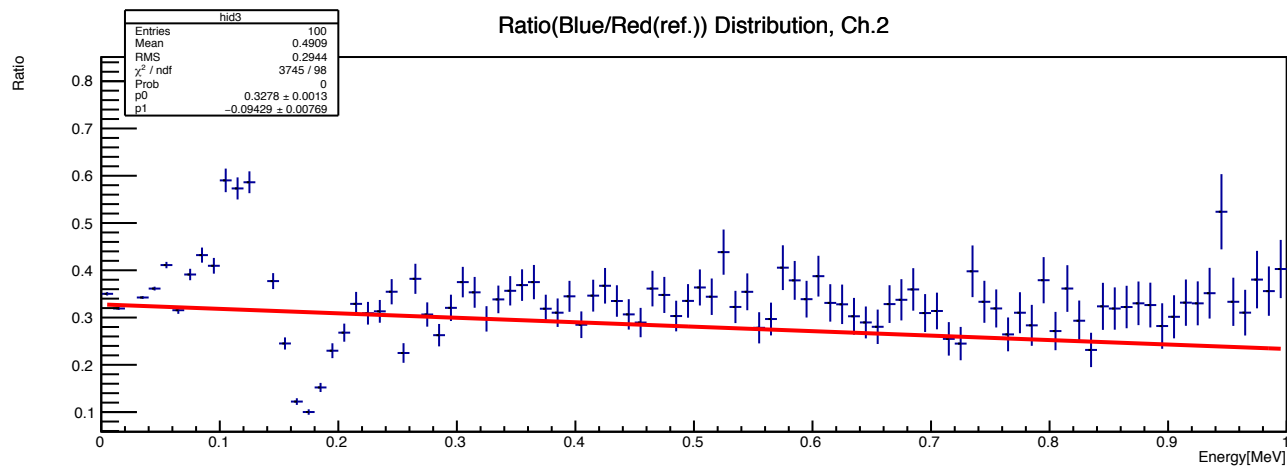
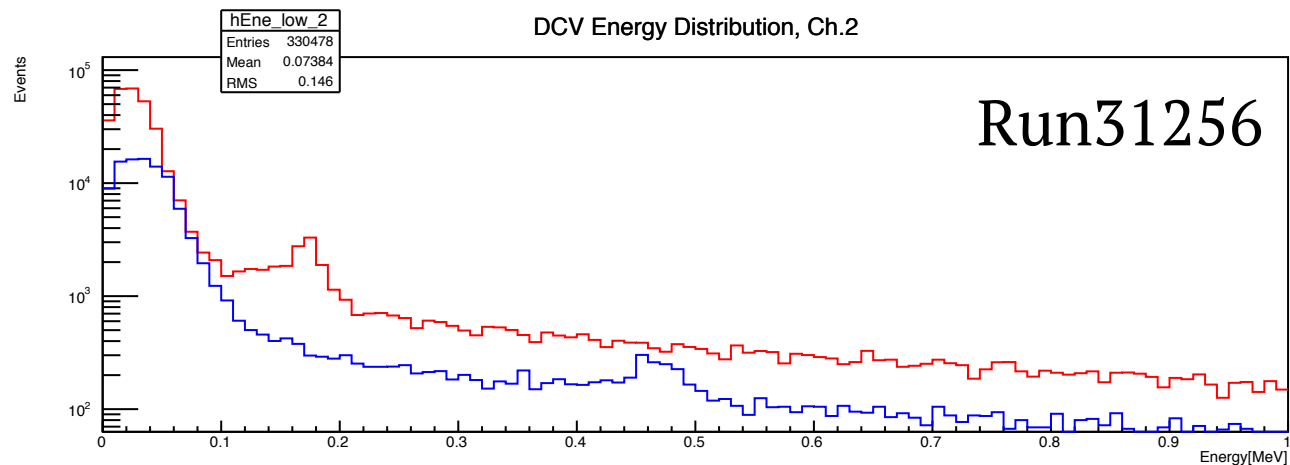
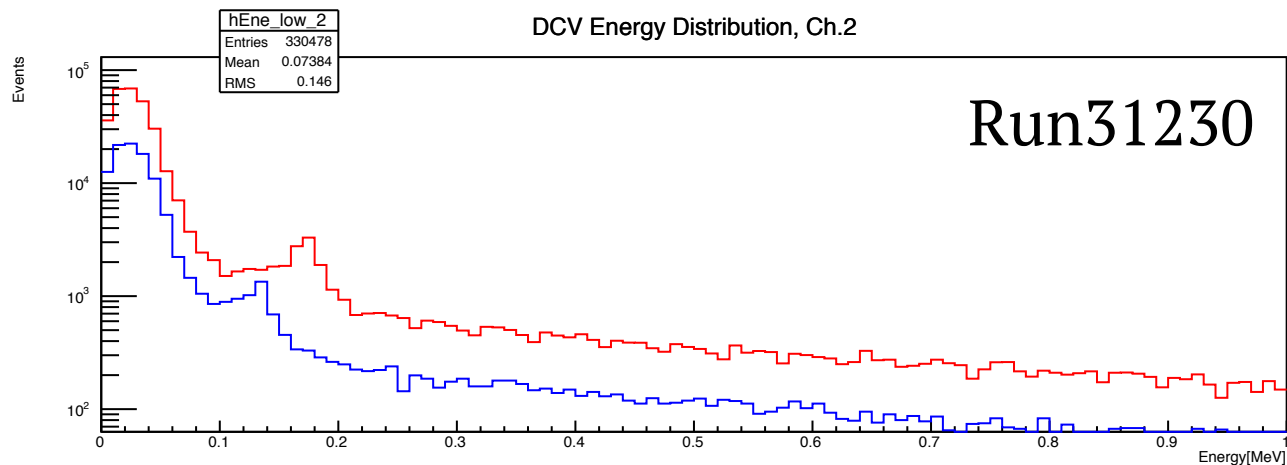
15:39 Run 31351 started ended

16:25 Run 31352 started ended

16:50 update map file of BHPV for pedestal suppression. (BHPV ch29)

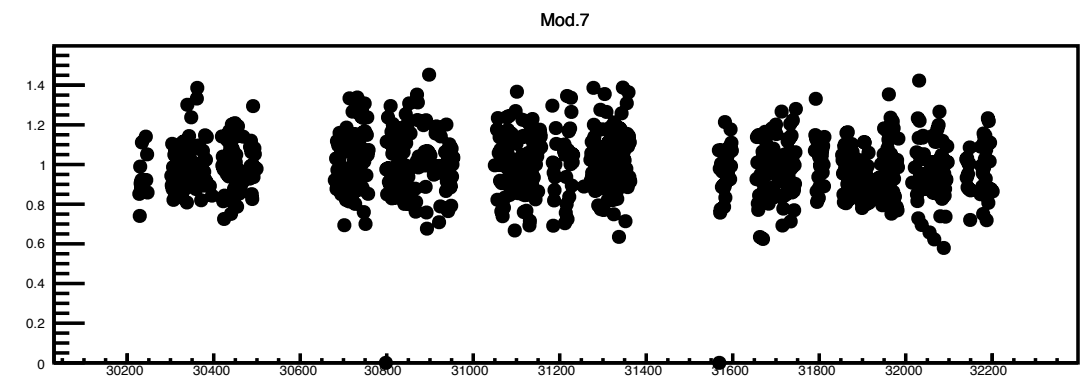
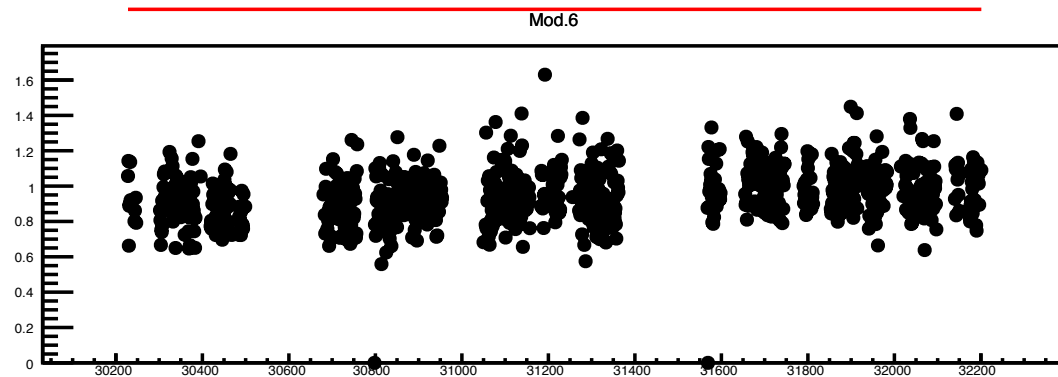
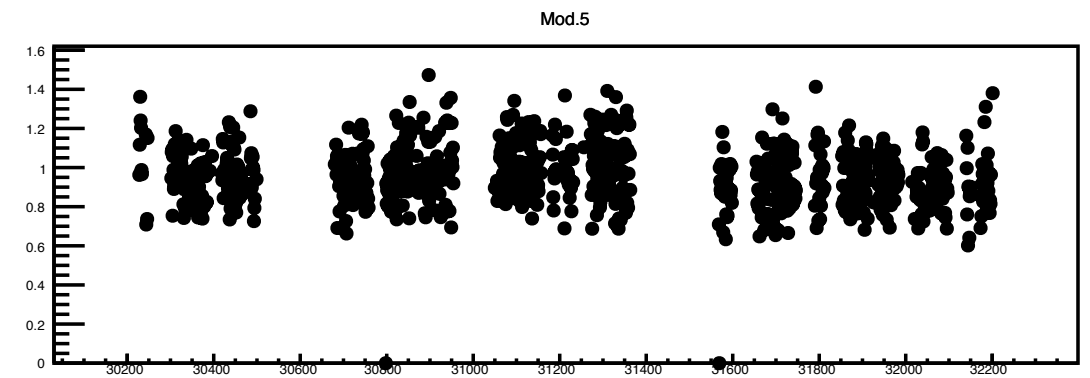
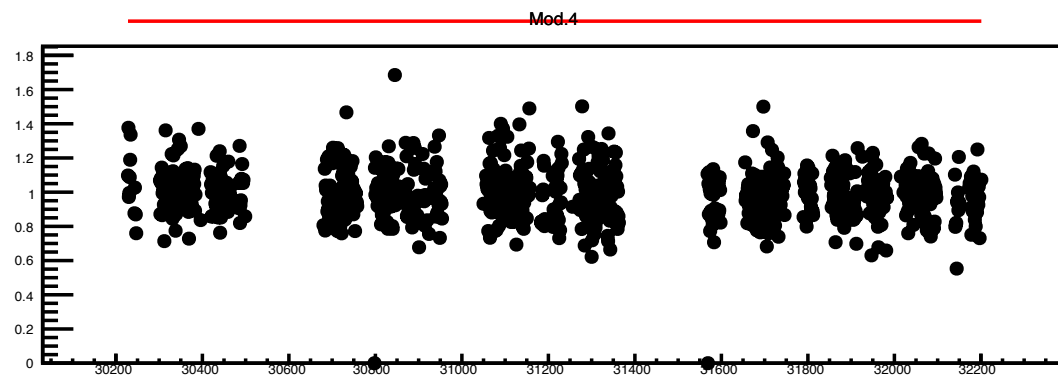
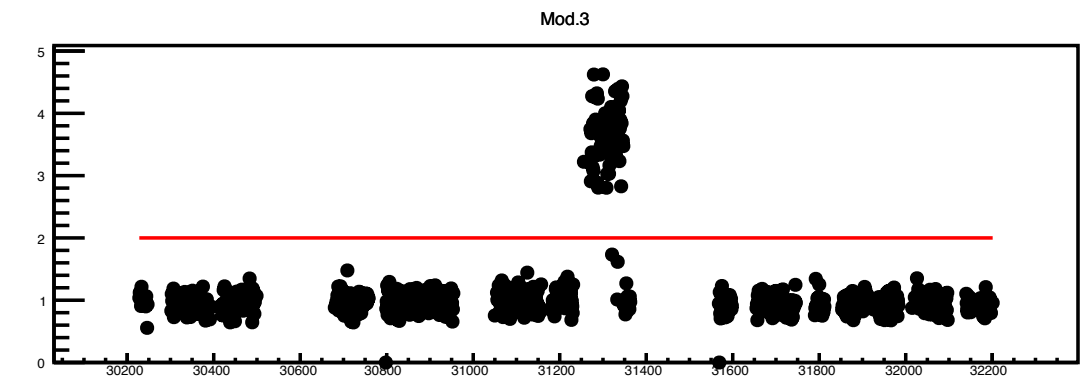
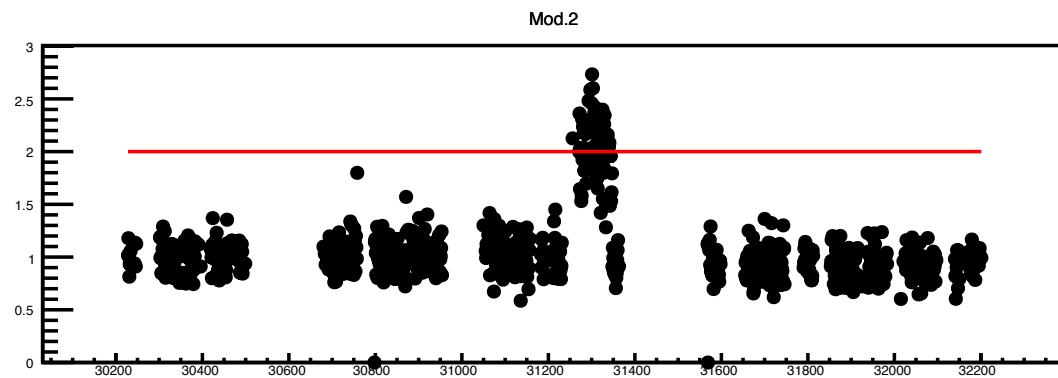
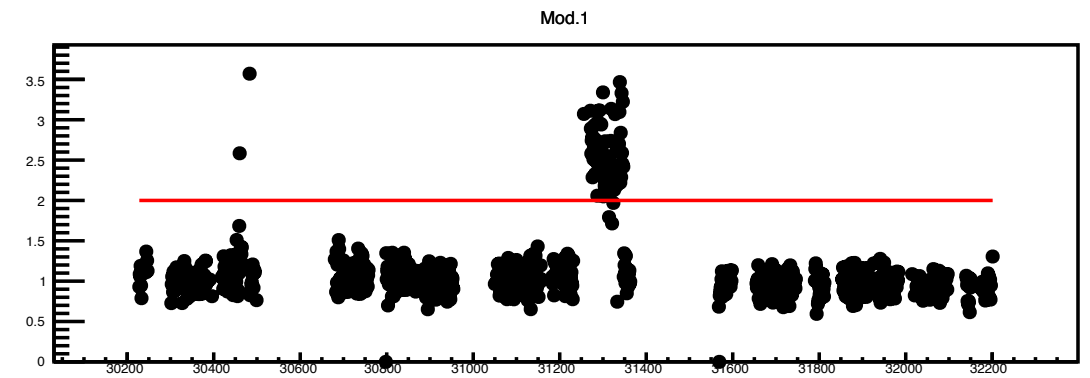
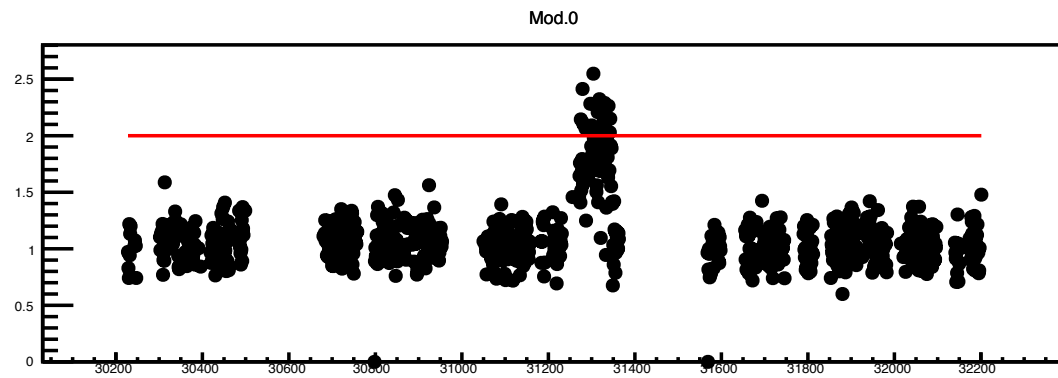
Shift Summary Sheet (Run81) 2019/03/17 [1:30- / 9:30- / 16:30-]

Shift Crew	Q.S. Lin T. Nomura
HV status	Csl, MPPC, FB, NCC, MB, MBCV, IB, IBCV, OEV, LCV, CC03, CC04, CC05, CC06, newBHCV, BHPV, BHGC
Data taking	Physics ~ 9 hrs.
Memo:	KL8/CL8BR momentum changed 10:02 $-0.7 \rightarrow +0.7$, 12:20 $+0.7 \rightarrow +1.4$, 13:25 $+1.4 \rightarrow -0.7 \text{ GeV/c}$



Chi square distribution(For Module) by run number

Fit Range : 1 ~ 10



Cosmic ray cross tracking, Period6(Run82)

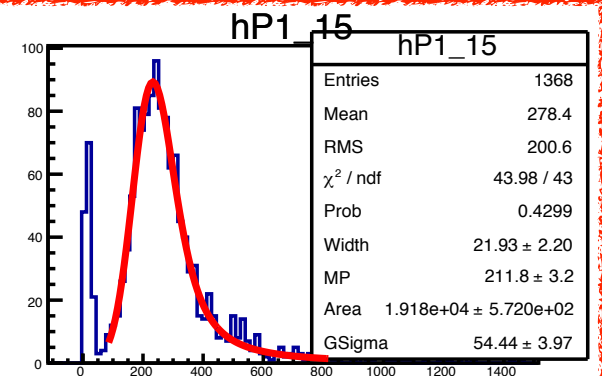
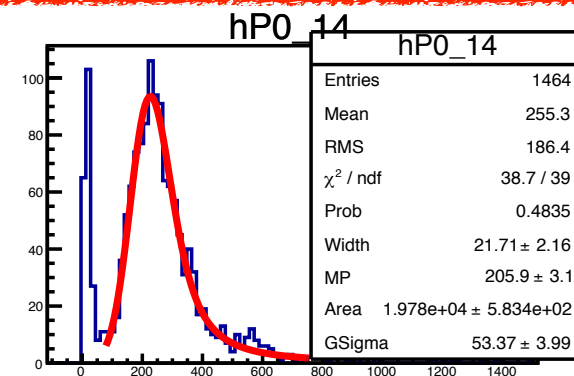
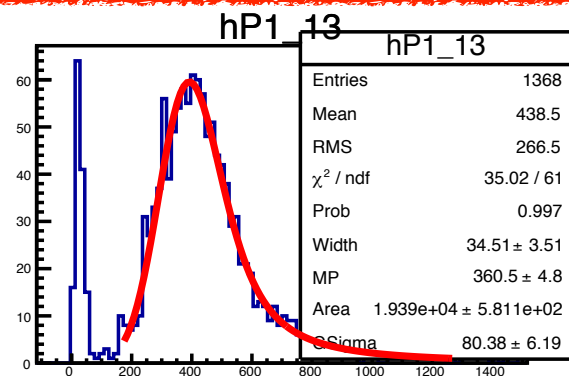
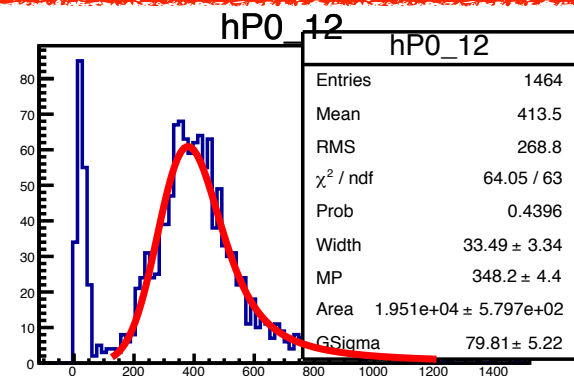
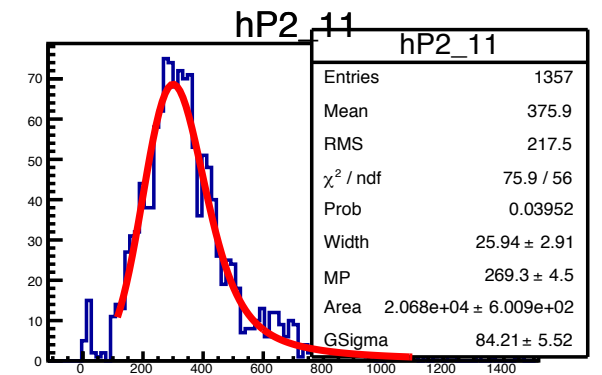
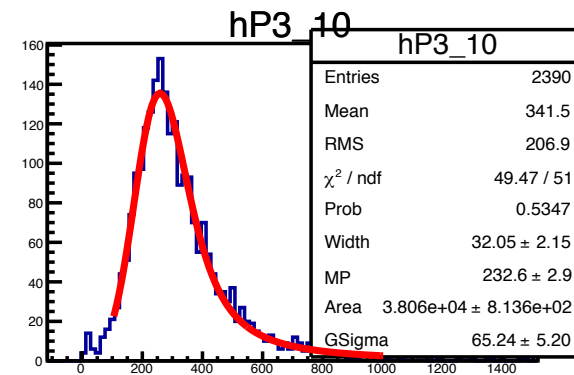
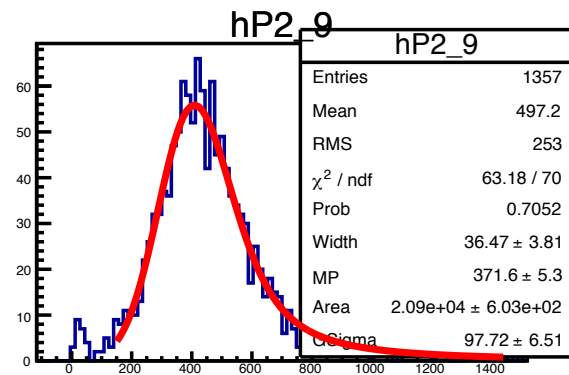
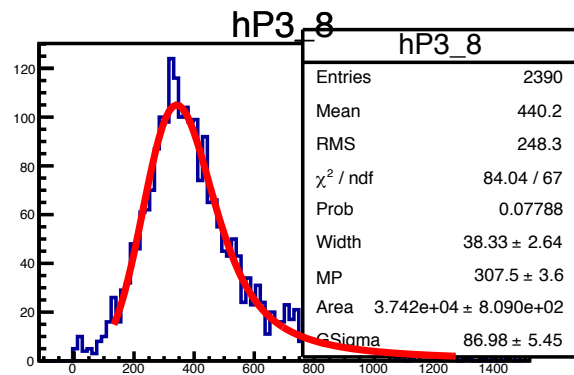
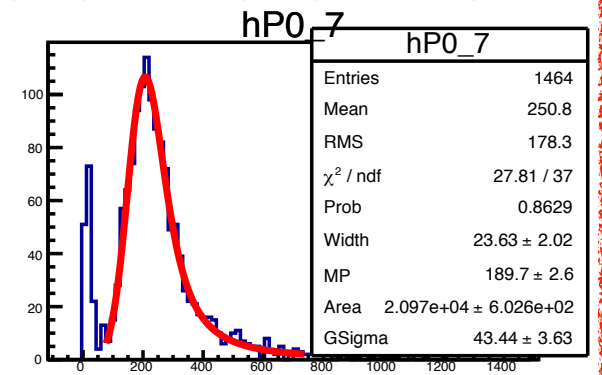
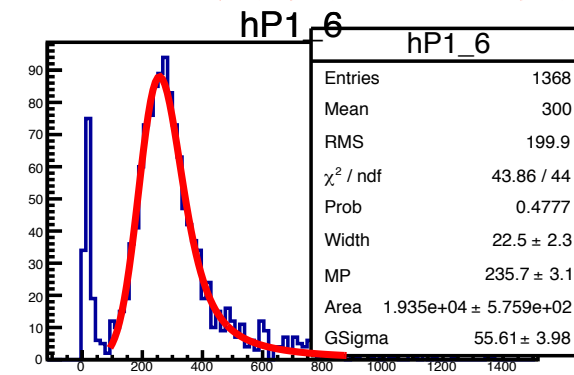
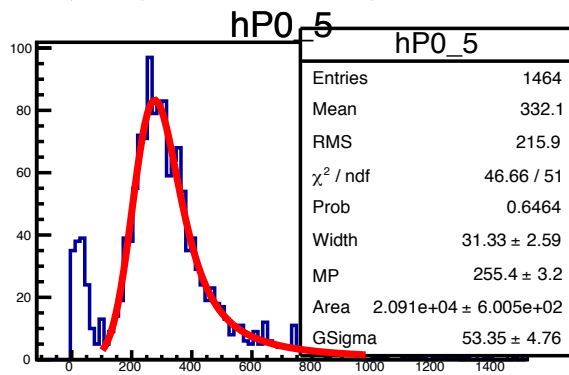
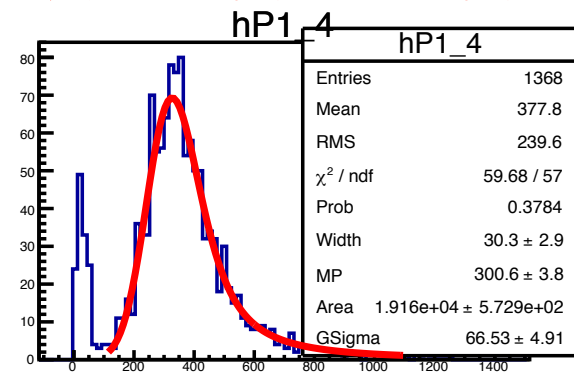
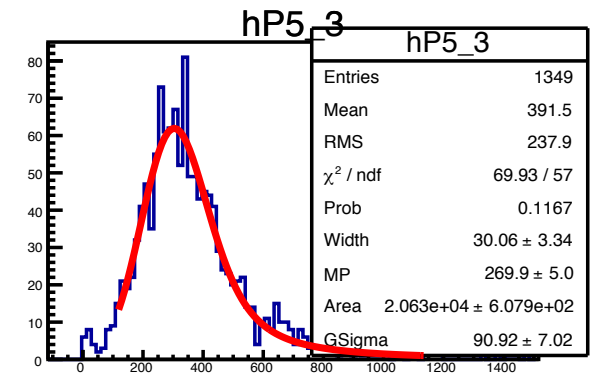
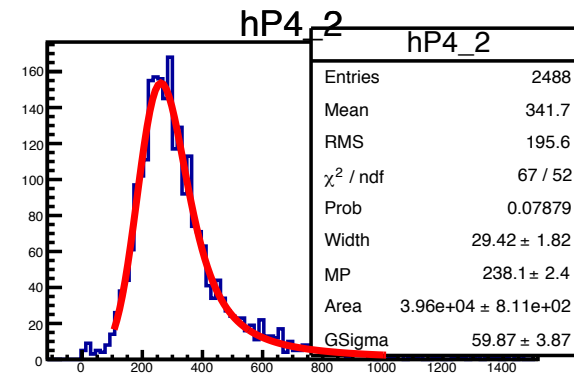
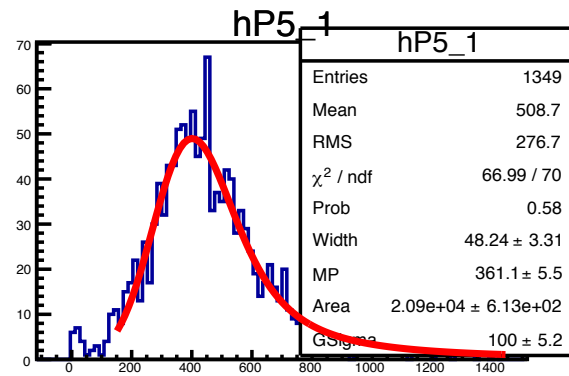
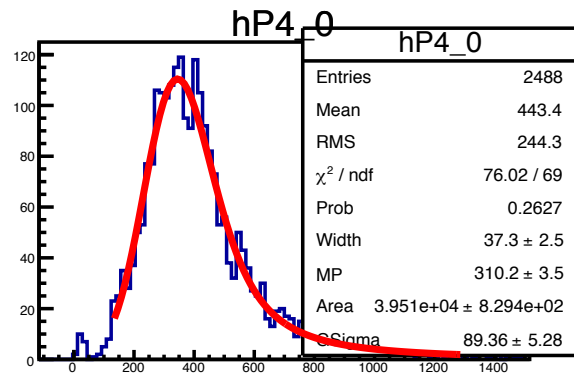
```
//Flag for Top & Bottom Cross
```

```
if( (hit_04[12]==1 || hit_04[13]==1 || hit_04[26]==1 || hit_04[27]==1 || hit_04[40]==1 || hit_04[41]==1)
    && (hit_04[10]==1 || hit_04[11]==1 || hit_04[24]==1 || hit_04[25]==1 || hit_04[38]==1 || hit_04[39]==1)
    && (hit_04[8]==1 || hit_04[9]==1 || hit_04[22]==1 || hit_04[23]==1 || hit_04[36]==1 || hit_04[37]==1)
    && (hit_04[4]==1 || hit_04[5]==1 || hit_04[18]==1 || hit_04[19]==1 || hit_04[32]==1 || hit_04[33]==1)
    && (hit_04[2]==1 || hit_04[3]==1 || hit_04[16]==1 || hit_04[17]==1 || hit_04[30]==1 || hit_04[31]==1)
    && (hit_04[0]==1 || hit_04[1]==1 || hit_04[14]==1 || hit_04[15]==1 || hit_04[28]==1 || hit_04[29]==1)
    && VetoFlag04[0]==0 && VetoFlag04[1] == 0) TrFlag04[6]=1;
```

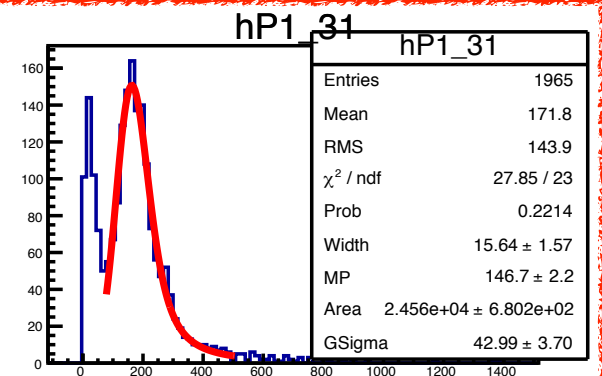
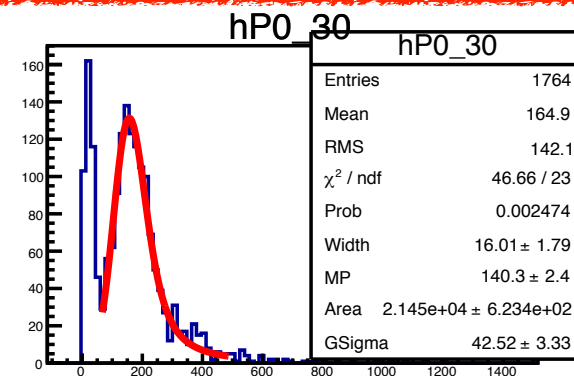
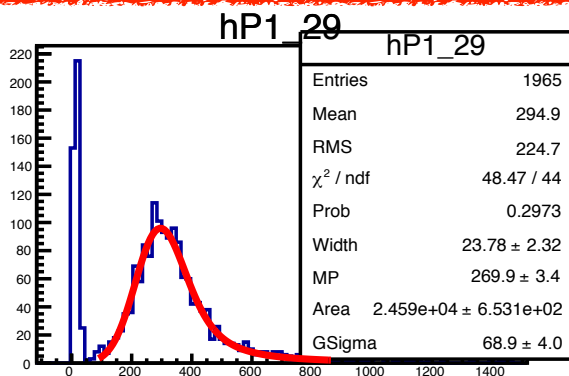
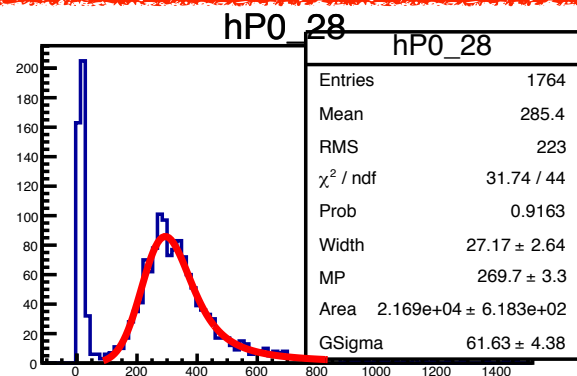
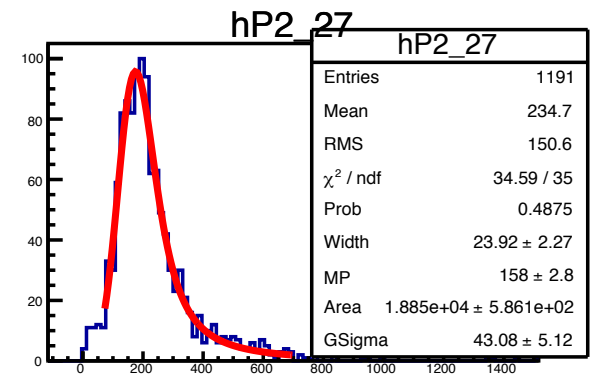
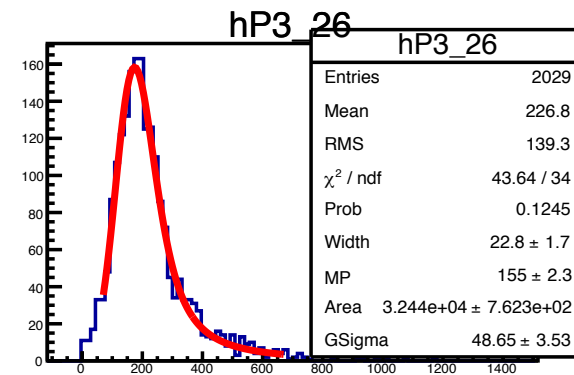
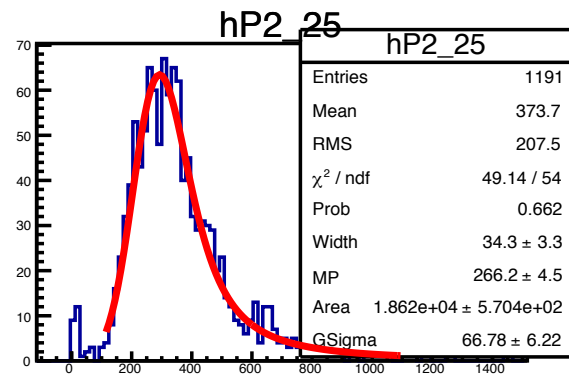
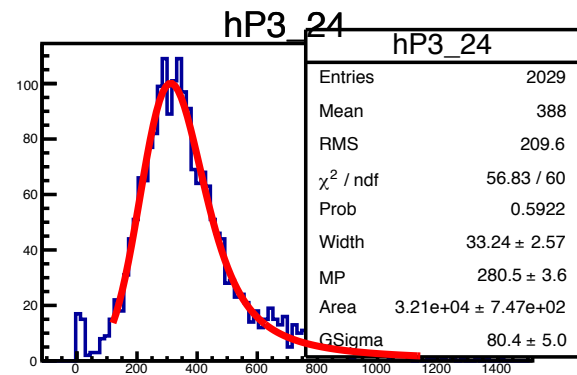
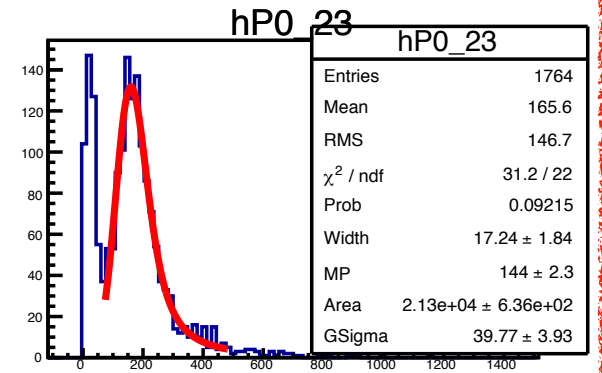
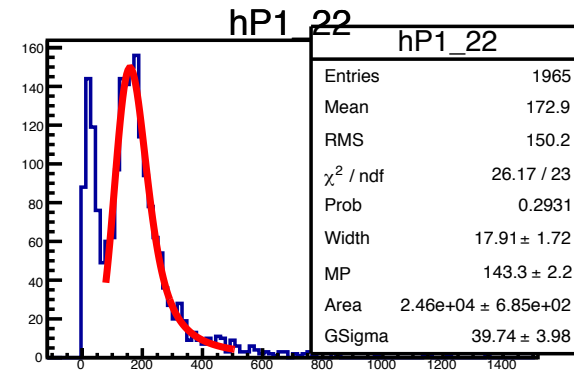
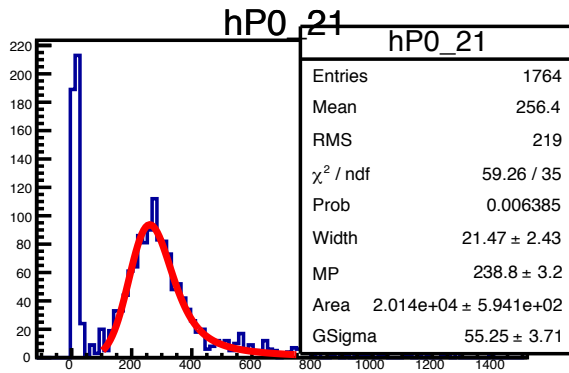
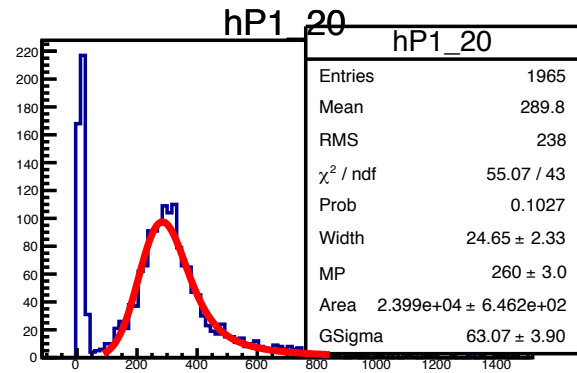
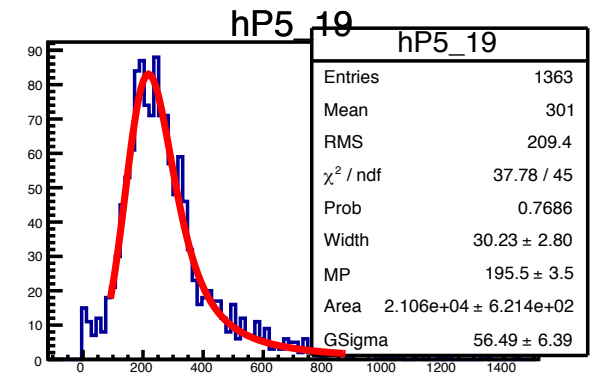
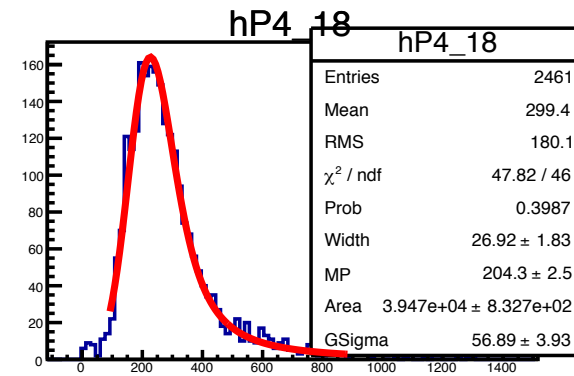
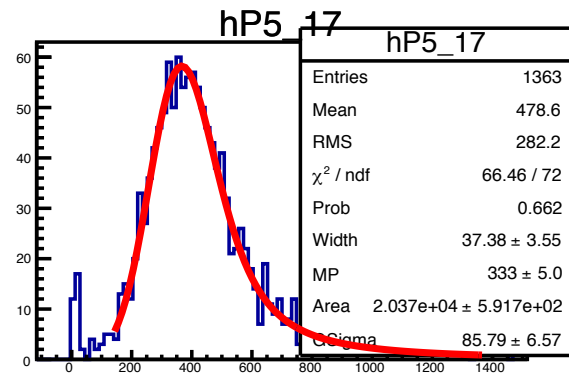
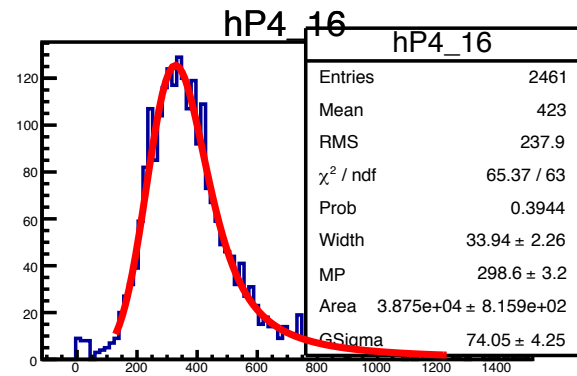
```
//Flag for Top & Bottom Cross
```

```
if( (hit_05[16]==1 || hit_05[17]==1 || hit_05[34]==1 || hit_05[35]==1 || hit_05[52]==1 || hit_05[53]==1)
    && (hit_05[14]==1 || hit_05[15]==1 || hit_05[32]==1 || hit_05[33]==1 || hit_05[50]==1 || hit_05[51]==1)
    && (hit_05[12]==1 || hit_05[13]==1 || hit_05[30]==1 || hit_05[31]==1 || hit_05[48]==1 || hit_05[49]==1)
    && (hit_05[4]==1 || hit_05[5]==1 || hit_05[22]==1 || hit_05[23]==1 || hit_05[40]==1 || hit_05[41]==1)
    && (hit_05[2]==1 || hit_05[3]==1 || hit_05[20]==1 || hit_05[21]==1 || hit_05[38]==1 || hit_05[39]==1)
    && (hit_05[0]==1 || hit_05[1]==1 || hit_05[18]==1 || hit_05[19]==1 || hit_05[36]==1 || hit_05[37]==1)
    && VetoFlag05[0]==0 && VetoFlag05[1] == 0) TrFlag05[6]=1;
```

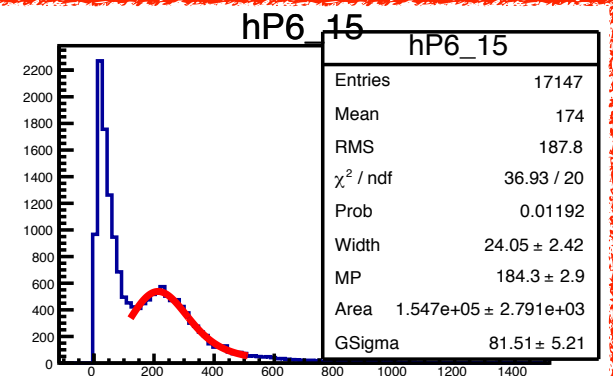
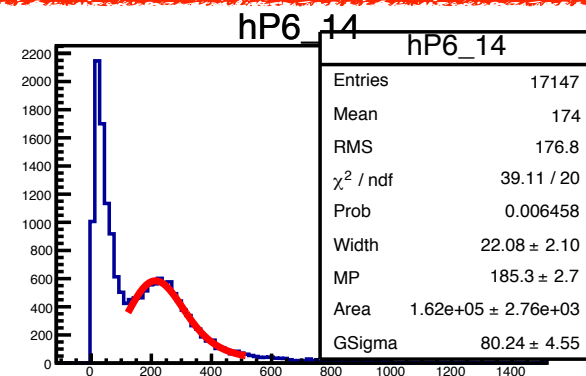
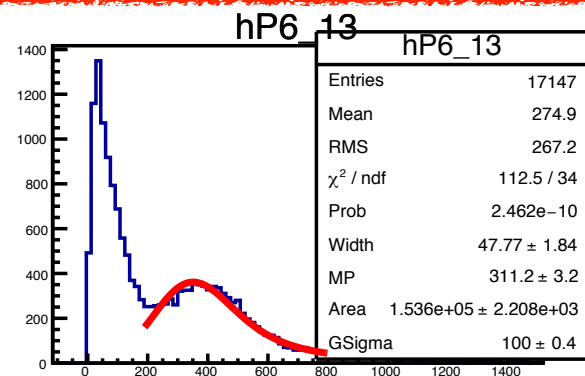
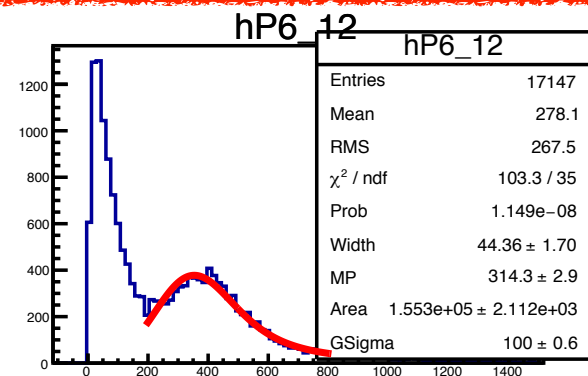
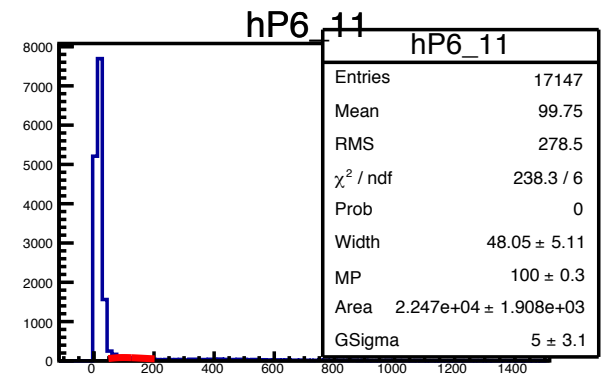
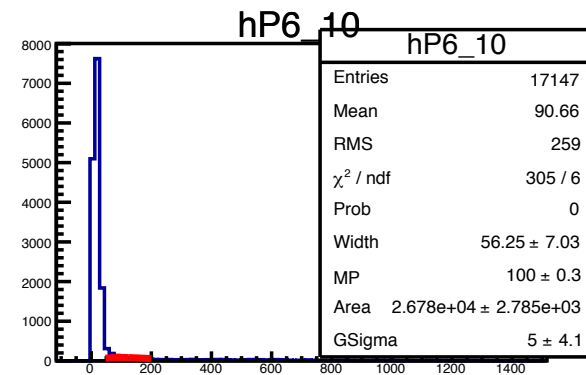
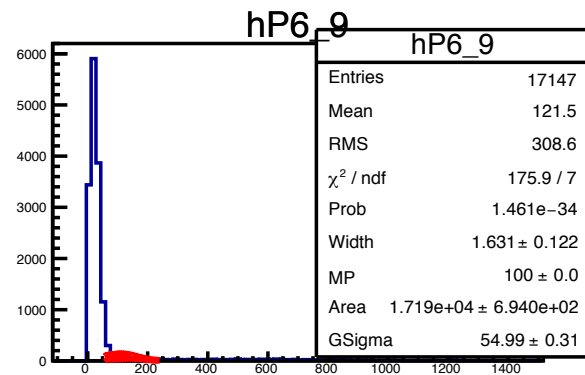
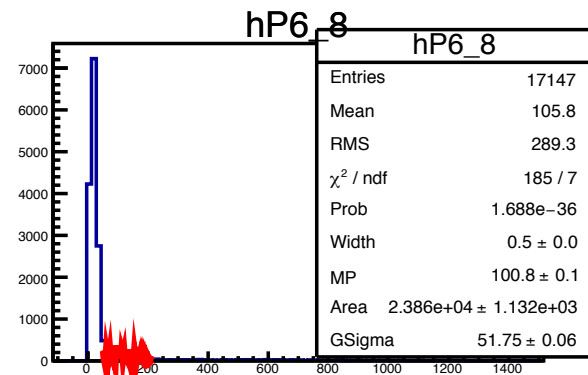
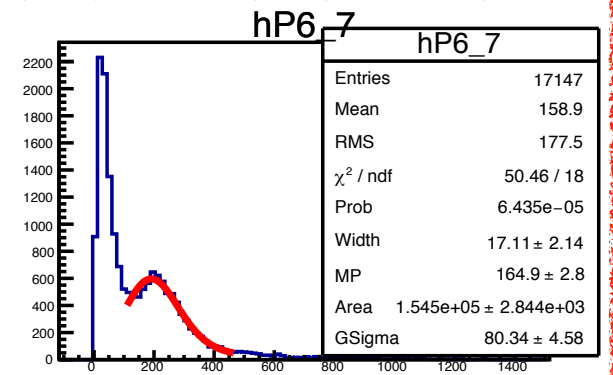
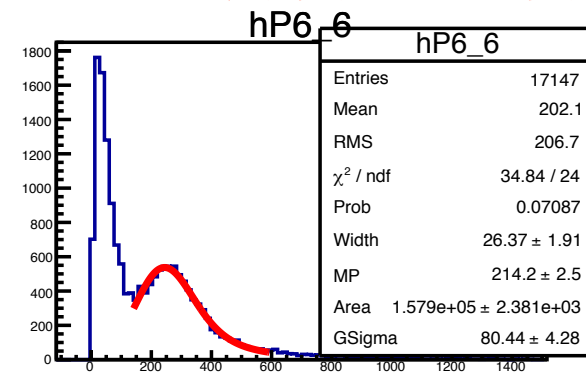
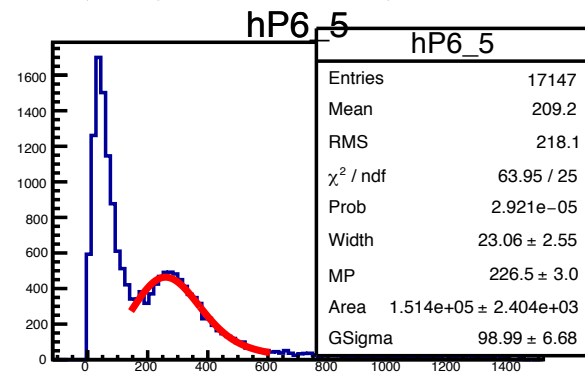
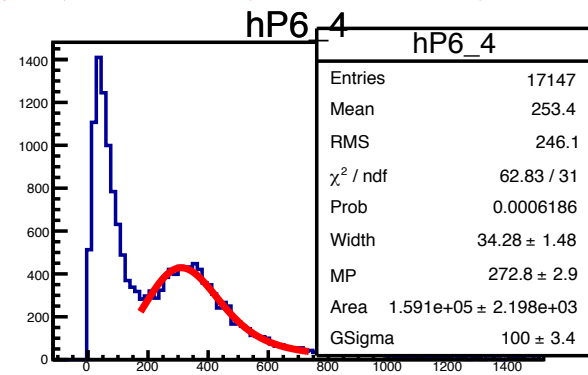
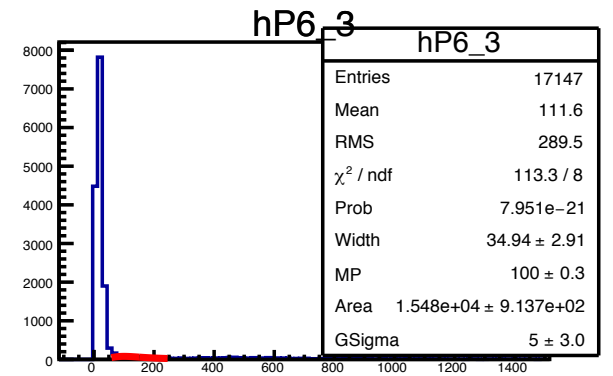
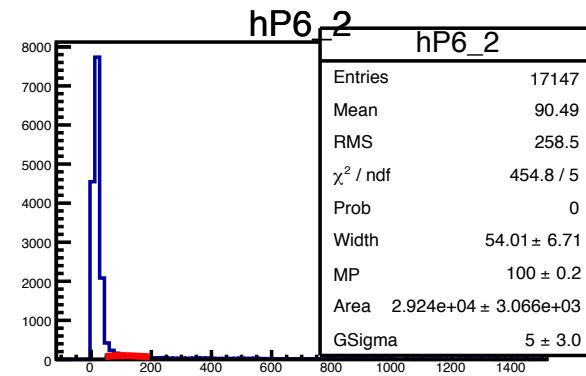
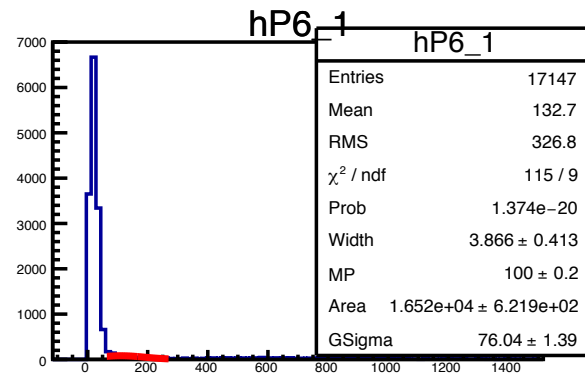
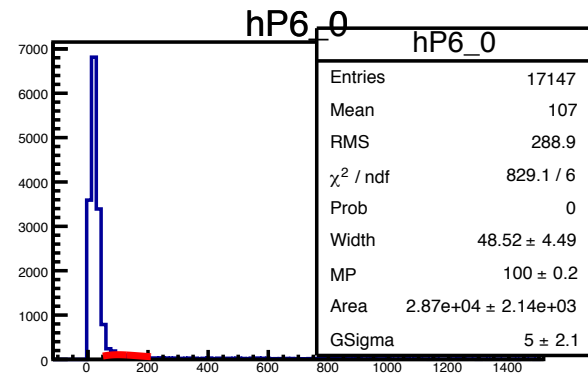
DCVPeak Distribution(DCV1, Flag 0, 1)



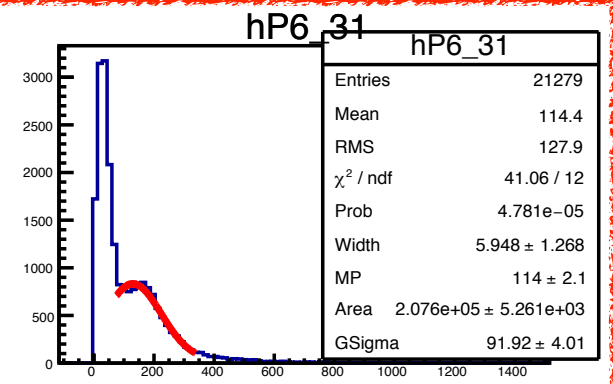
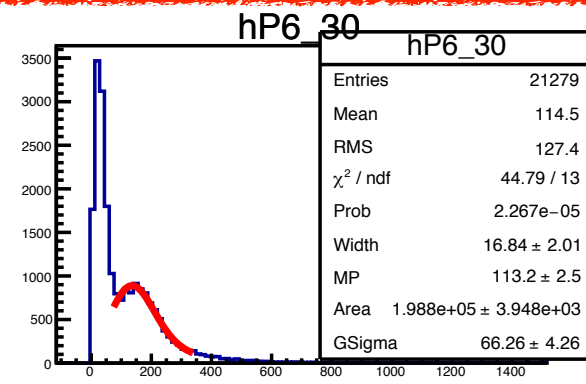
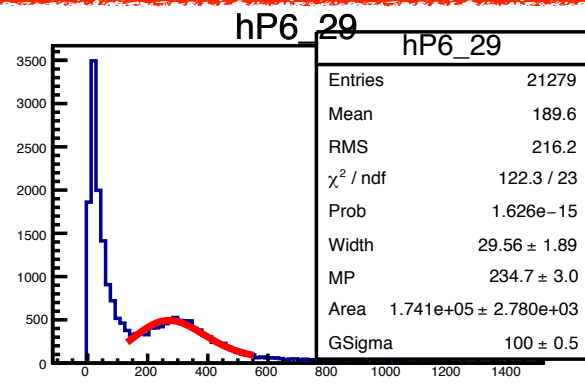
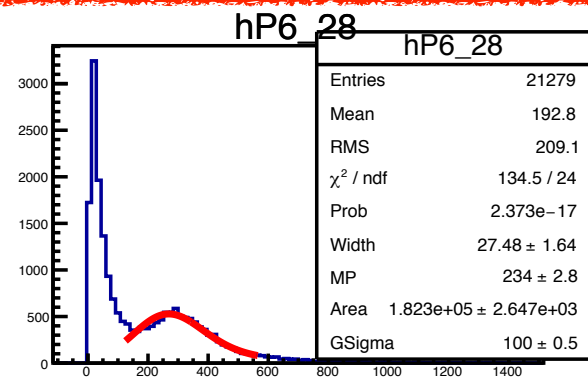
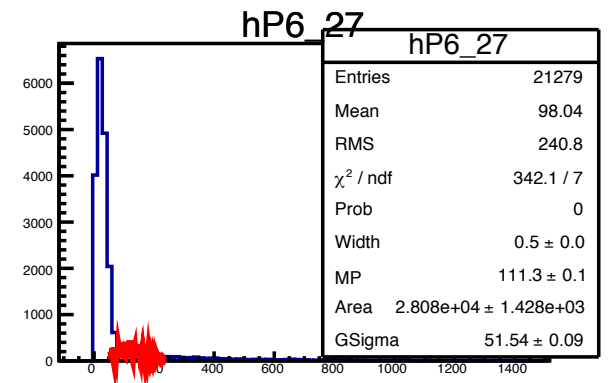
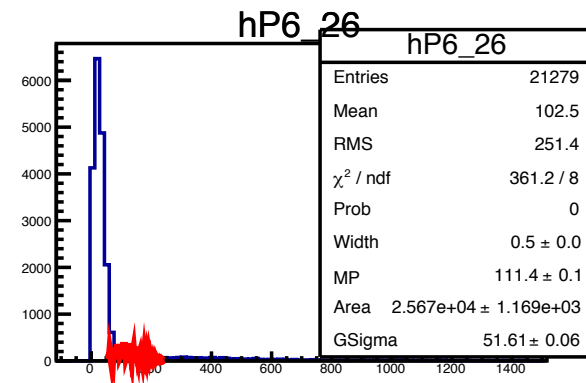
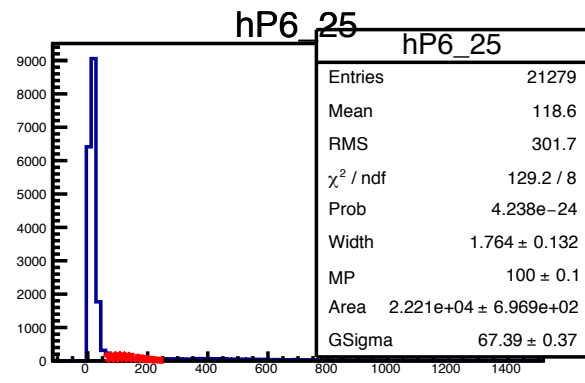
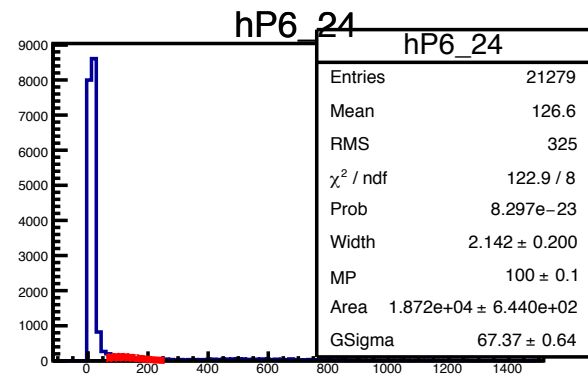
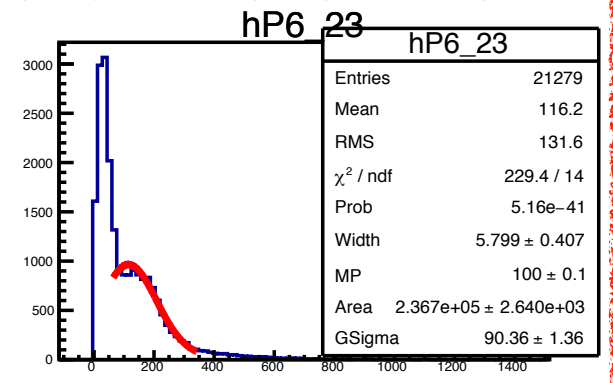
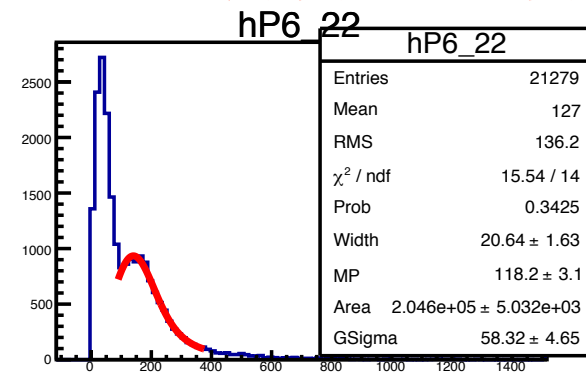
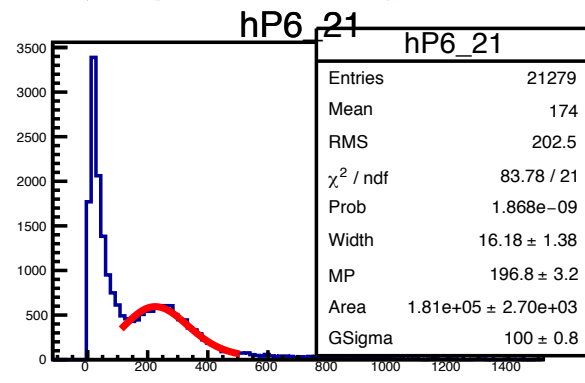
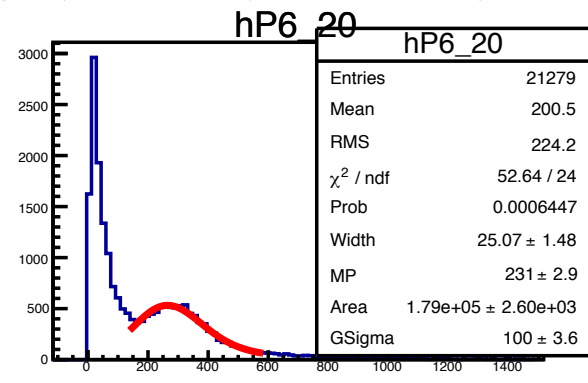
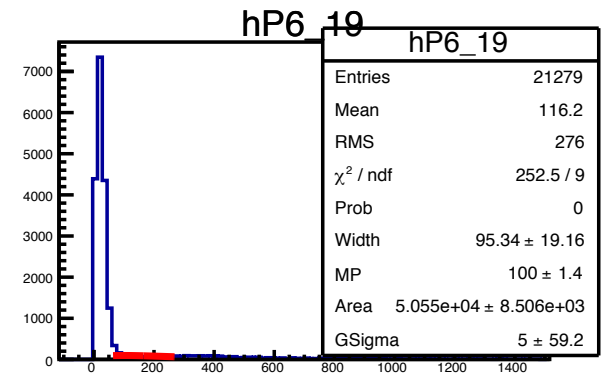
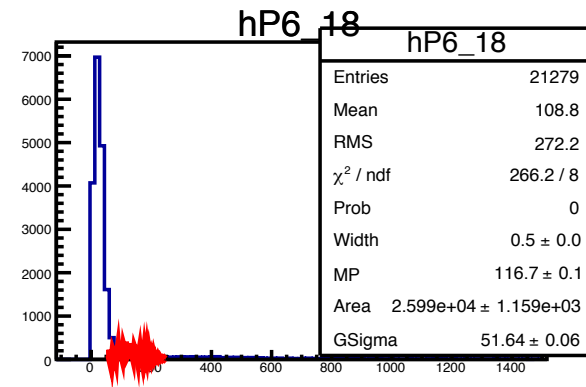
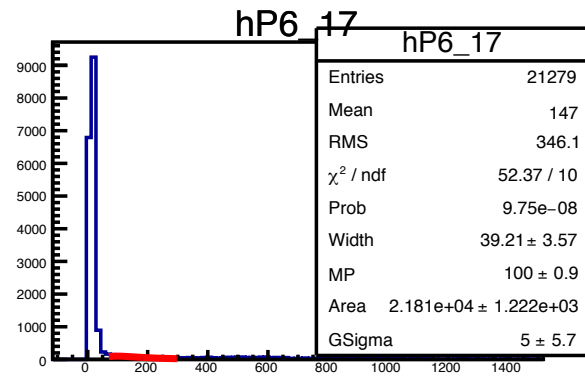
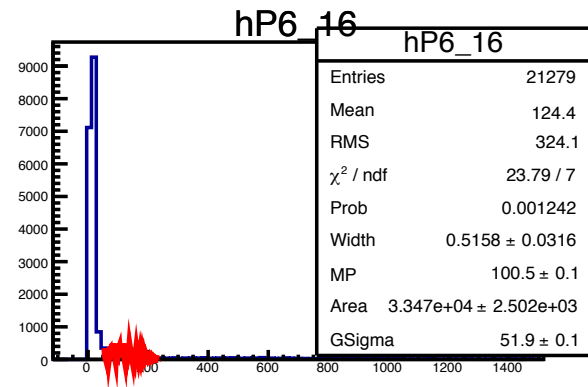
DCVPeak Distribution(DCV2, Flag 0, 1)



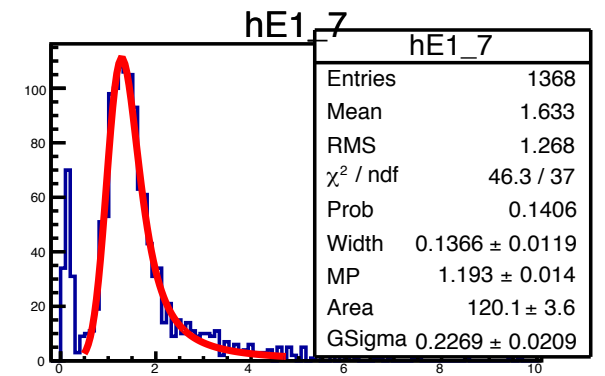
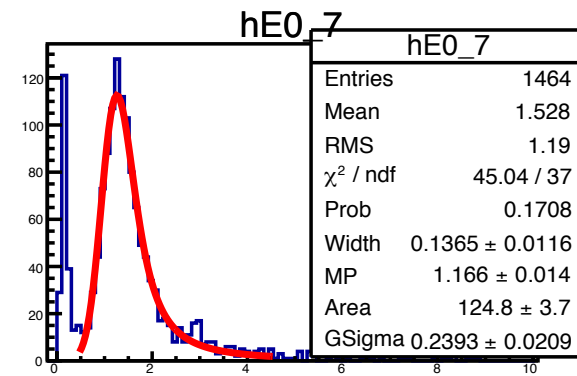
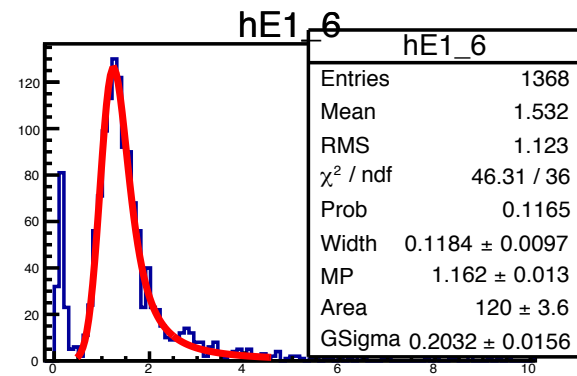
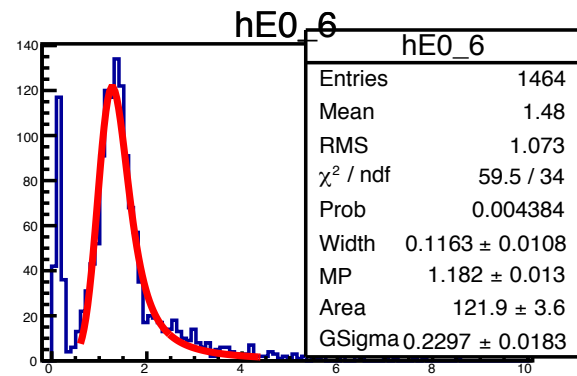
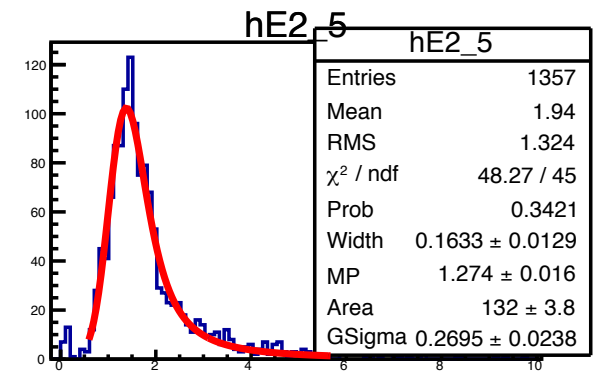
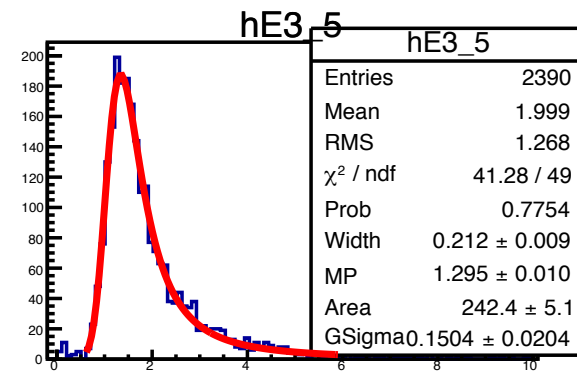
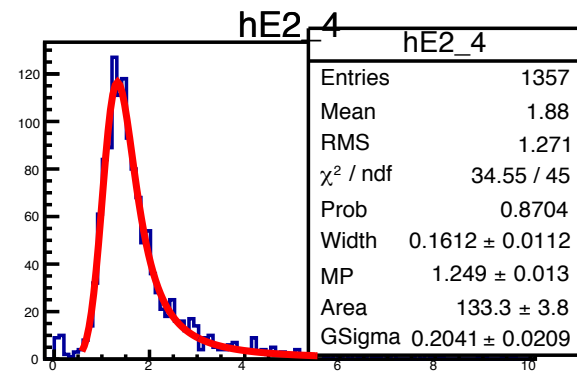
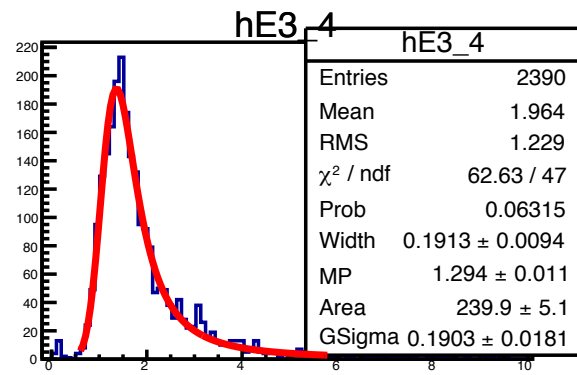
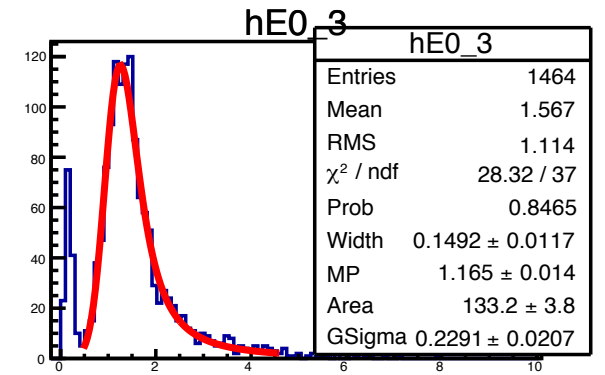
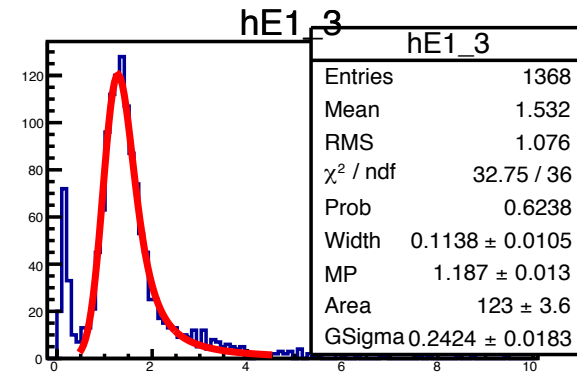
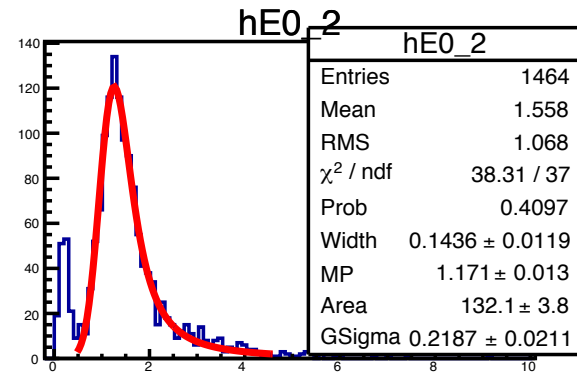
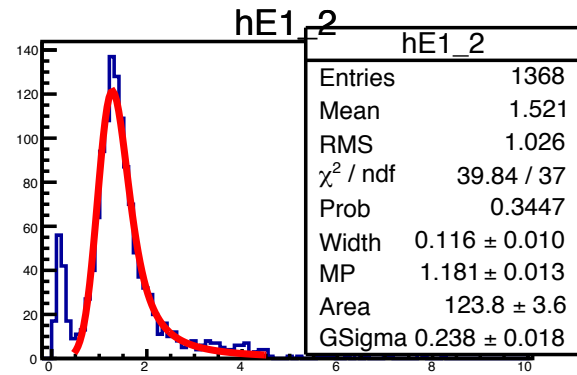
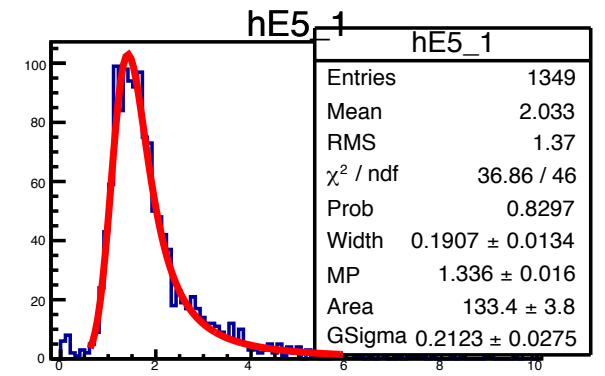
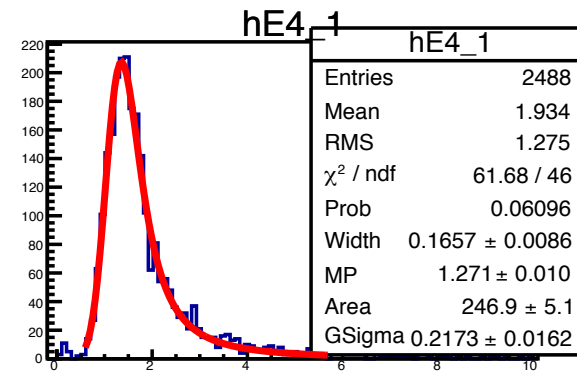
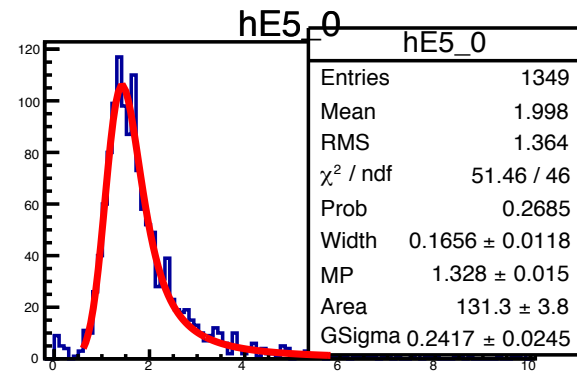
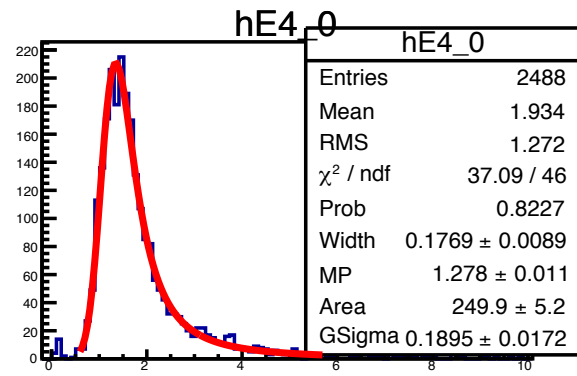
DCVPeak Distribution(DCV1, Flag 6)

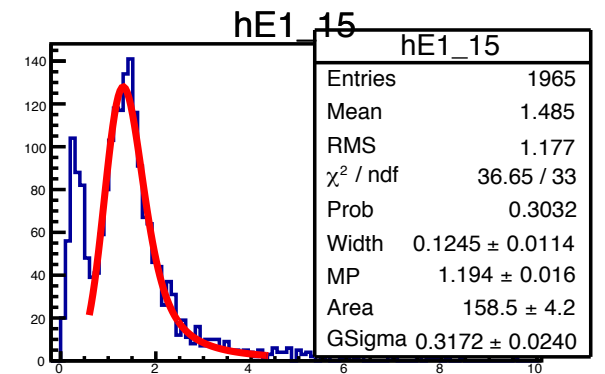
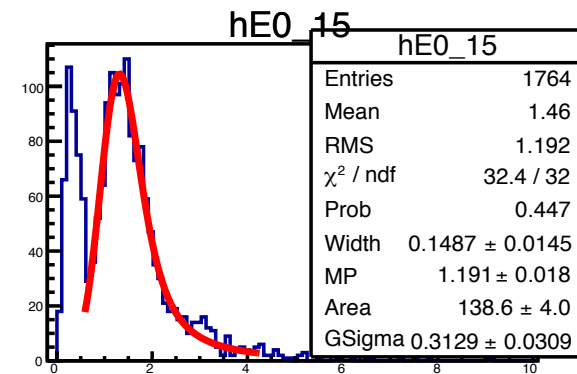
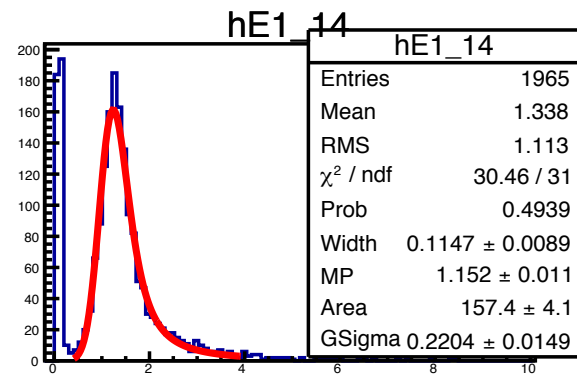
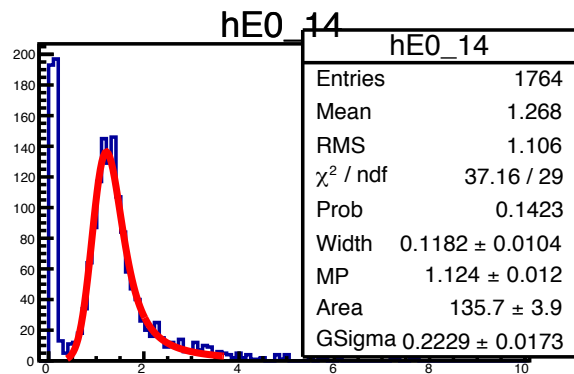
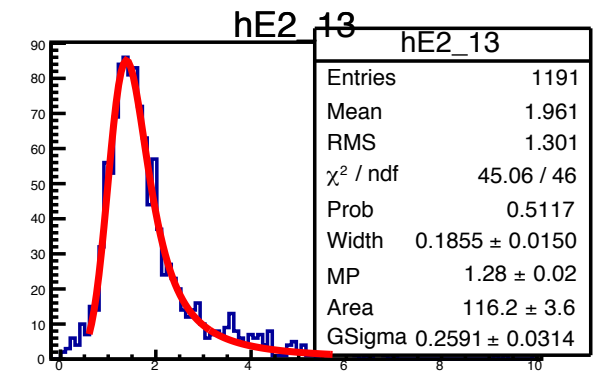
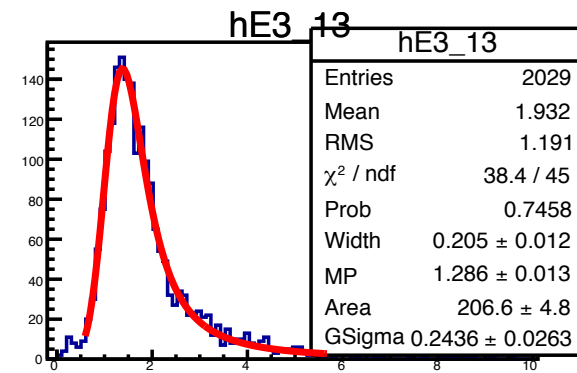
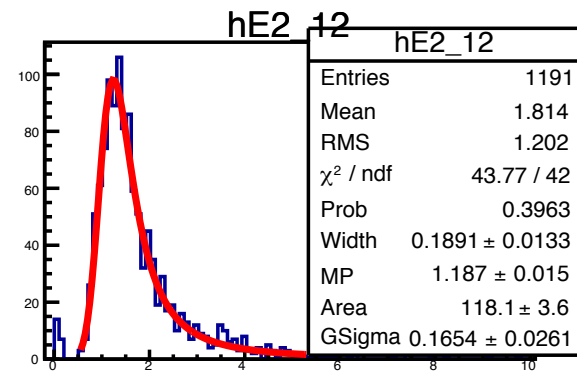
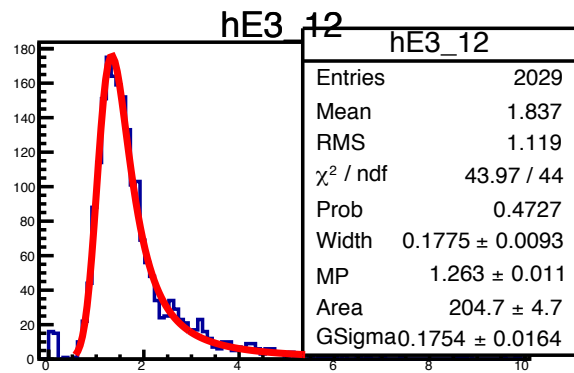
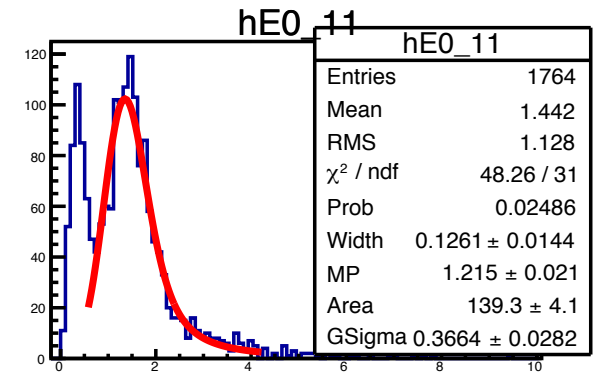
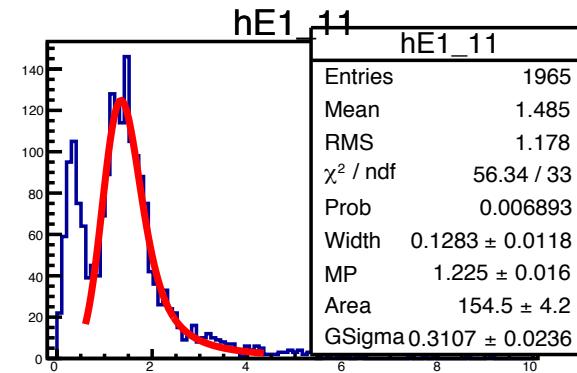
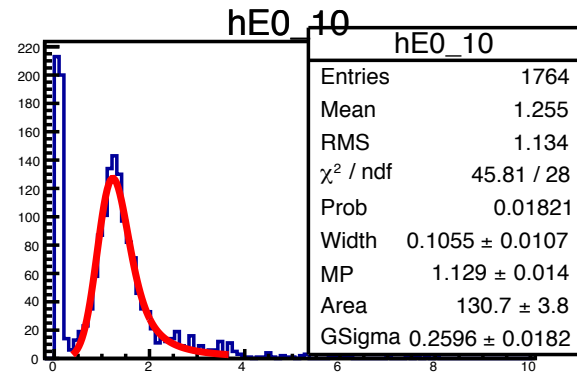
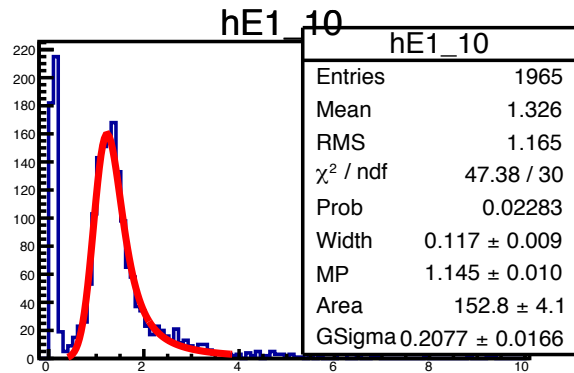
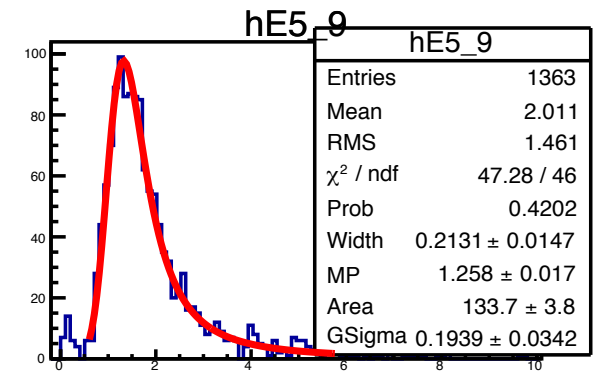
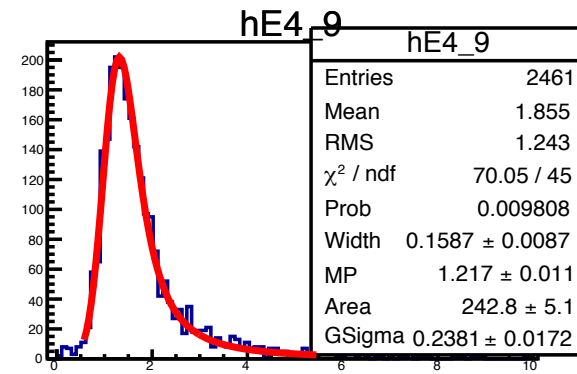
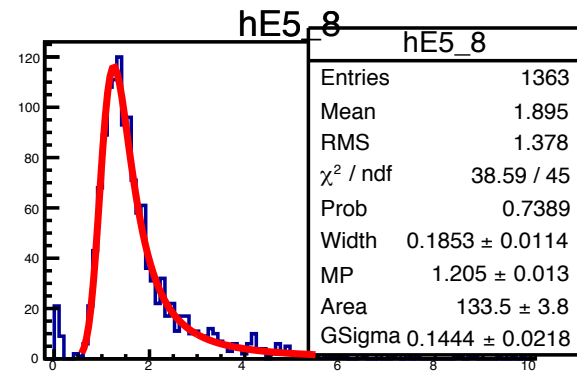
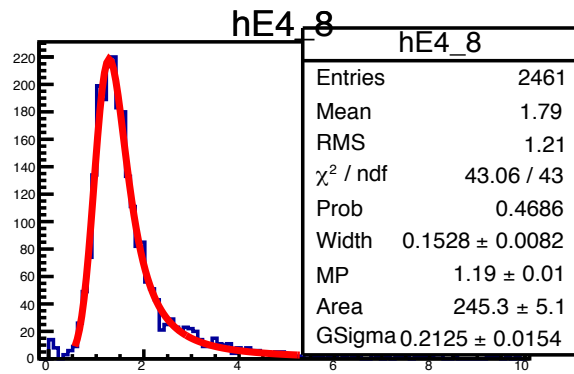


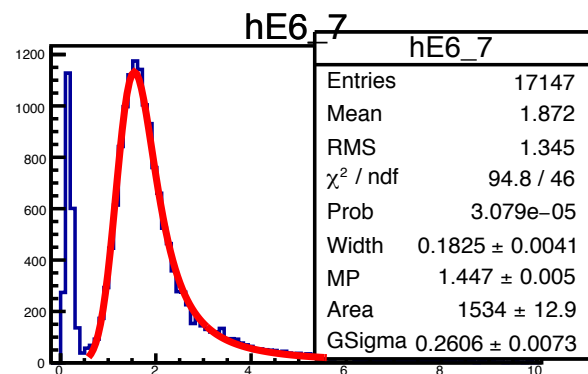
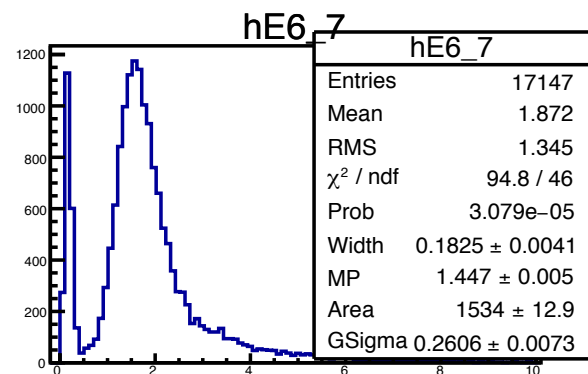
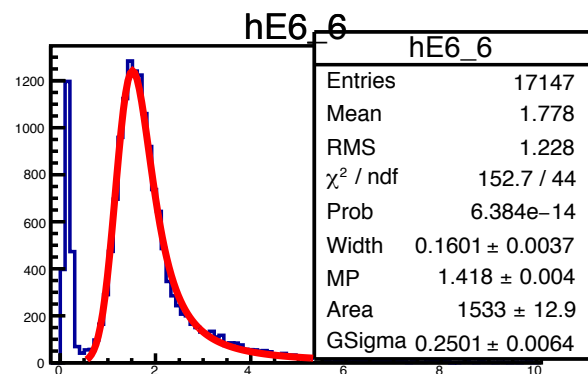
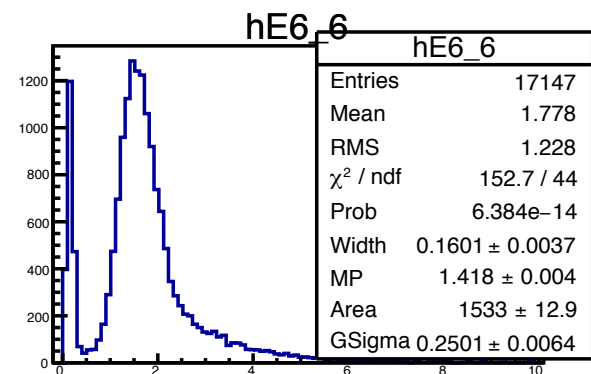
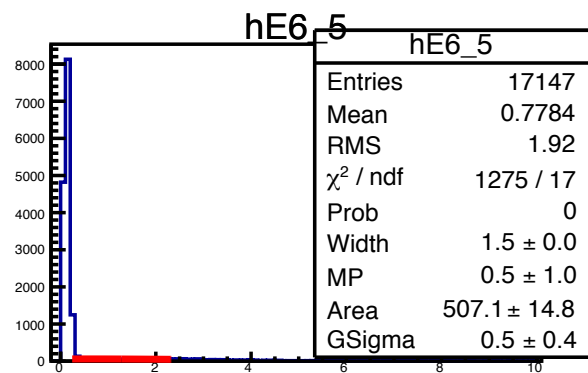
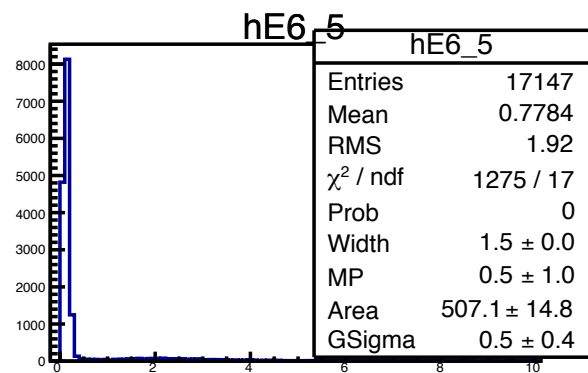
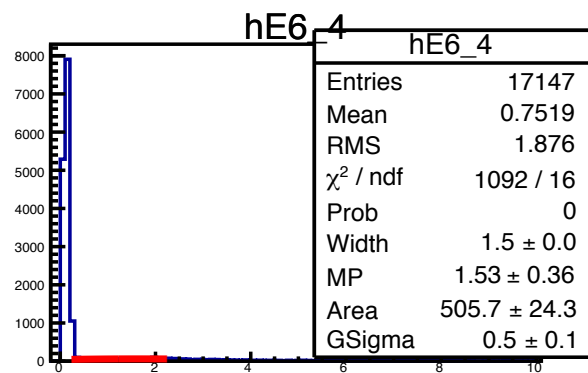
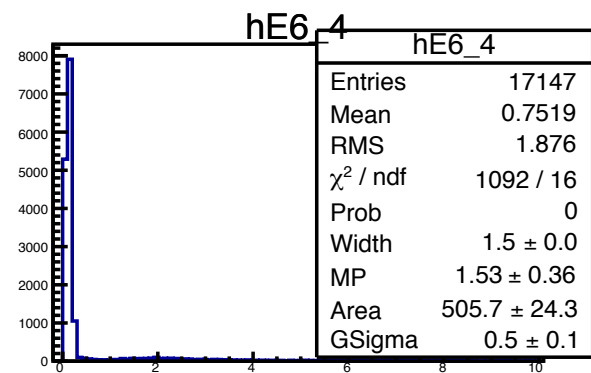
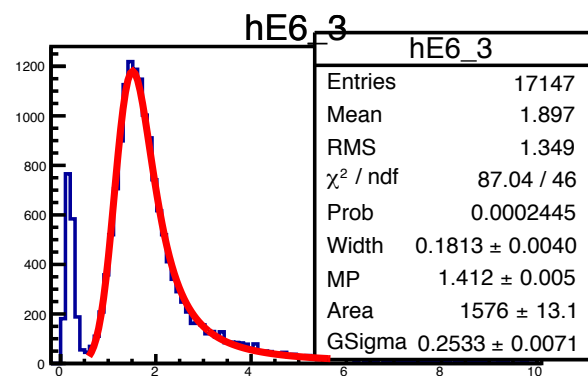
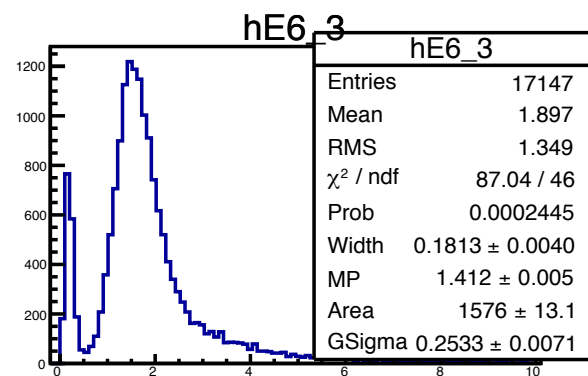
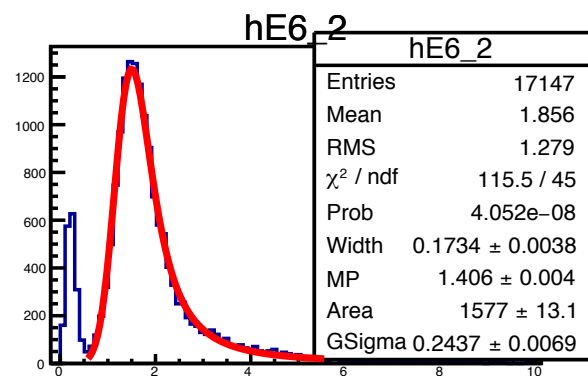
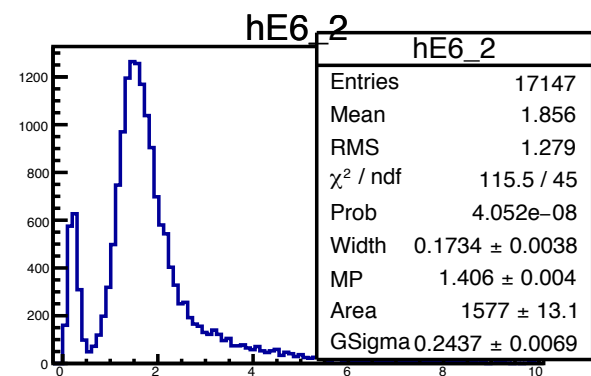
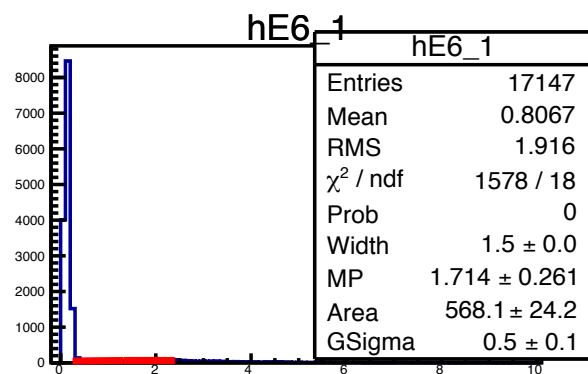
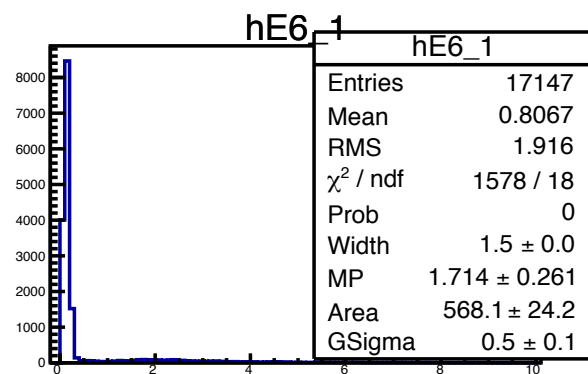
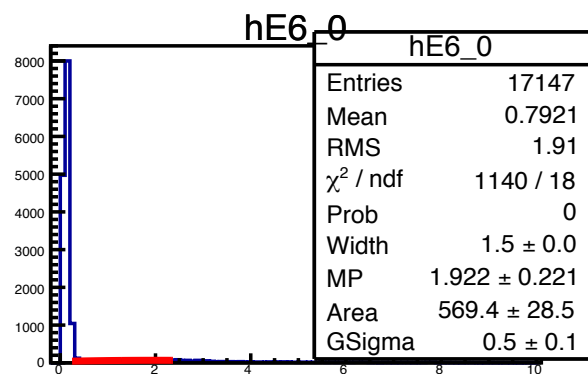
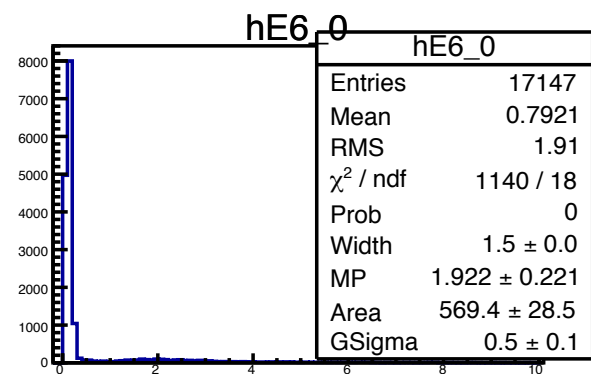
DCVPeak Distribution(DCV2, Flag 6)

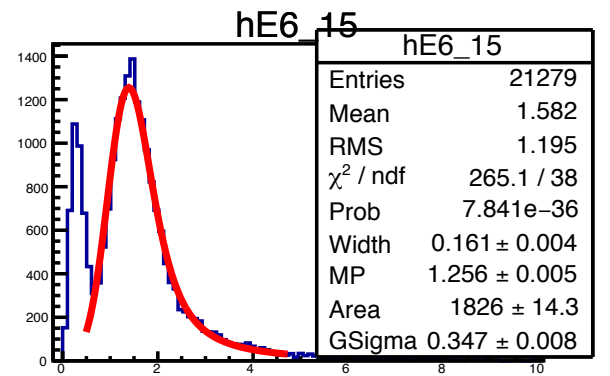
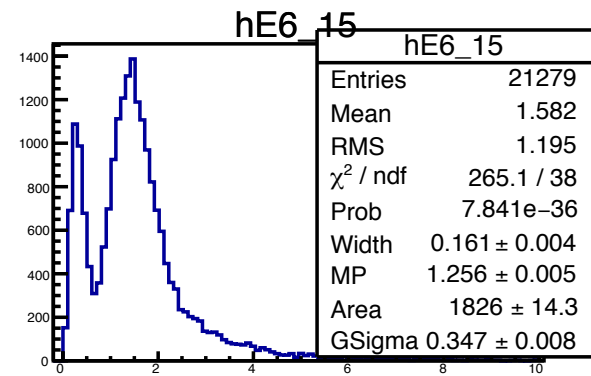
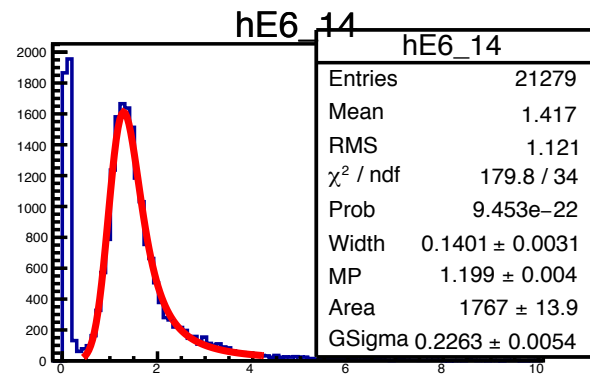
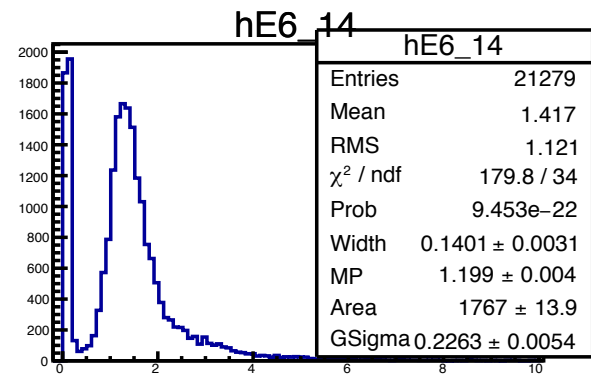
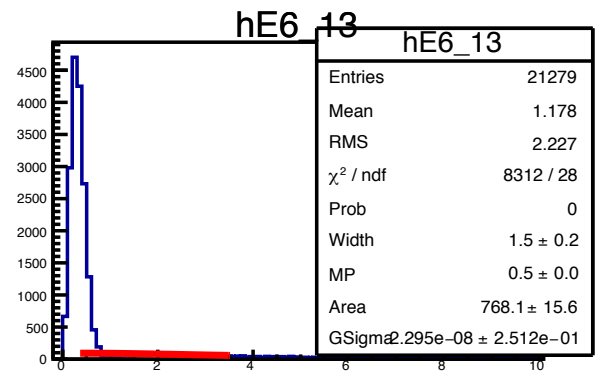
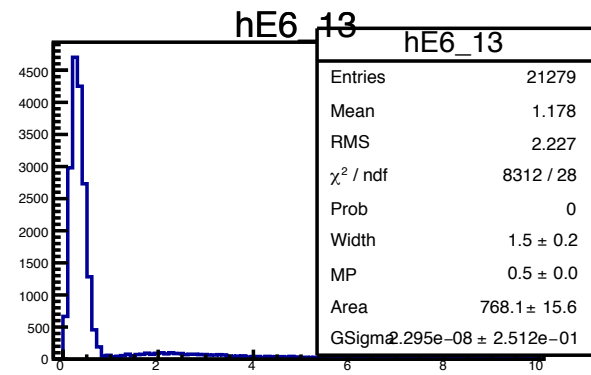
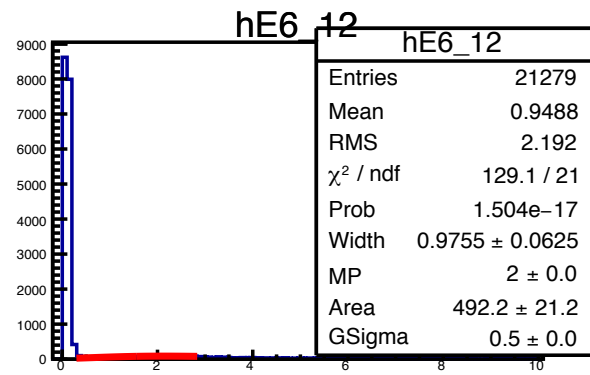
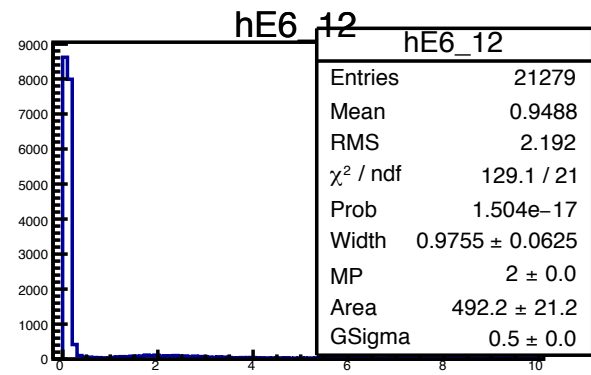
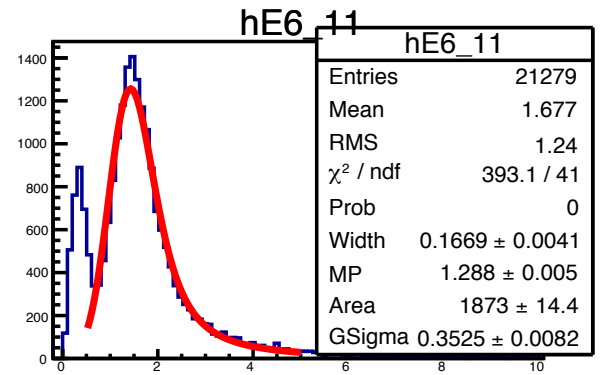
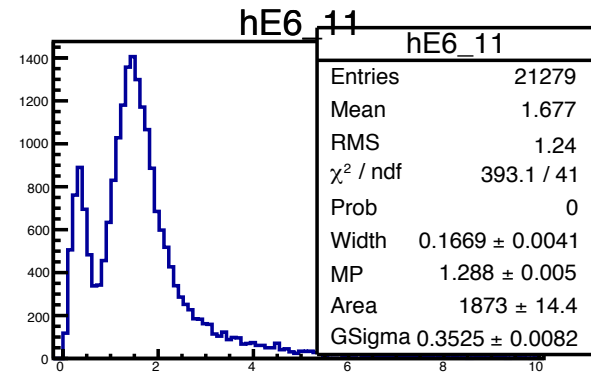
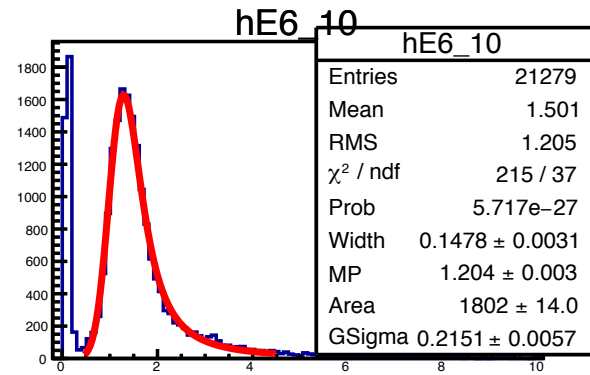
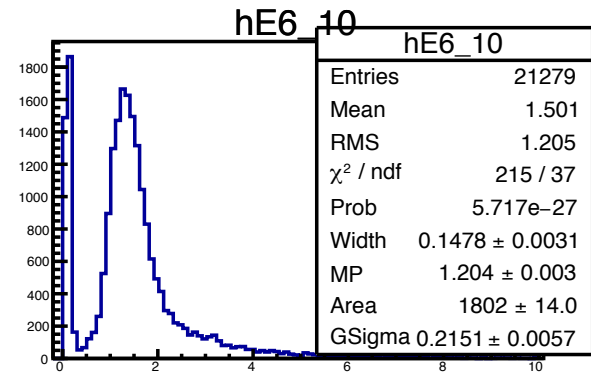
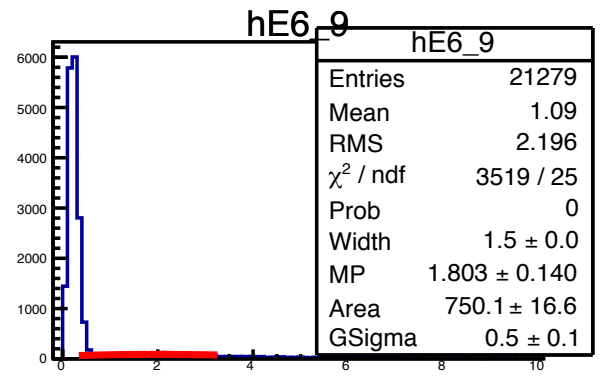
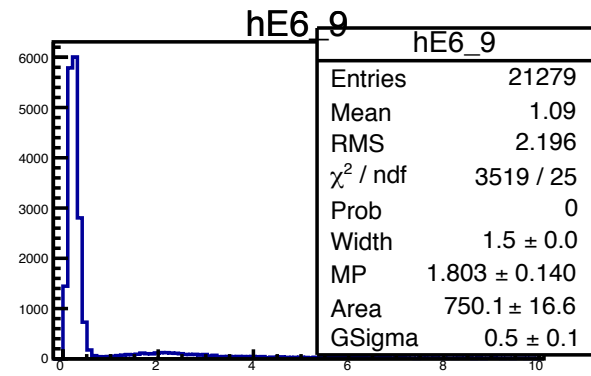
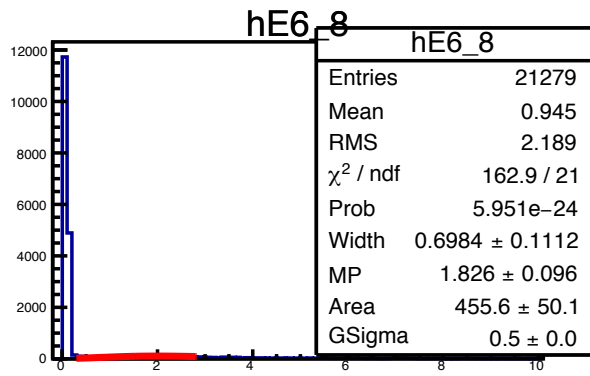
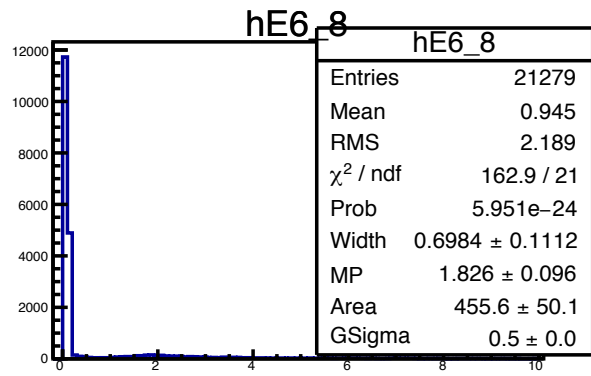


	North or South	Cross		North or South	Cross
Ch. 4	300.6	272.8	Ch. 20	260.0	231.0
Ch. 5	255.4	226.5	Ch. 21	238.8	196.8
Ch. 6	235.7	214.2	Ch. 22	143.3	118.2
Ch. 7	189.7	164.9	Ch. 23	144.0	100.0
Ch. 12	348.2	314.3	Ch. 28	269.7	234.0
Ch. 13	360.5	311.2	Ch. 29	269.9	234.7
Ch. 14	205.9	185.3	Ch. 30	140.3	113.2
Ch. 15	211.8	184.3	Ch. 31	146.7	114.0









[illegible]