BCO Issues

Maya SHIMOMURA, Itaru Nakagawa, Takashi Hachiya

bco_full – bco distribution on a felix (Run#9328)

$$(((bco\_full\&0x7F)-bco)<0?((bco\_full\&0x7F)-bco+128):((bco\_full\&0x7F)-bco))$$
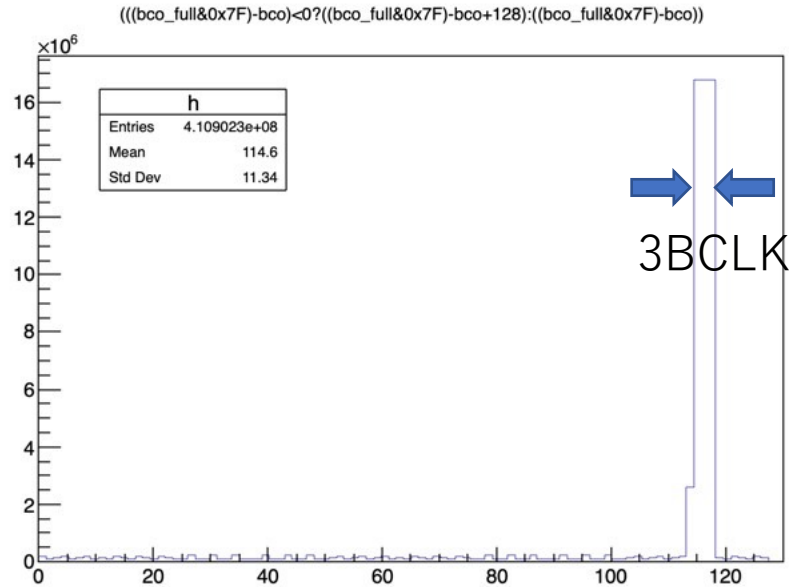

Plot : run#9328, intt2, n_collision=4

Subtracting "bco" from the lower 8 bits of "bco_full"

What we expect is 1 BCLK peak.

- Although we confirmed 1BCLK time resolution when we timed in intt-2 on May 31st, the peak is composed by 3BCLK size in Run#9328. Inconsistent.
- MBD phase timing change can only explain only 2BCLK.
- Satellite shoulder may be invisible in the time-in plot made on May 31st.

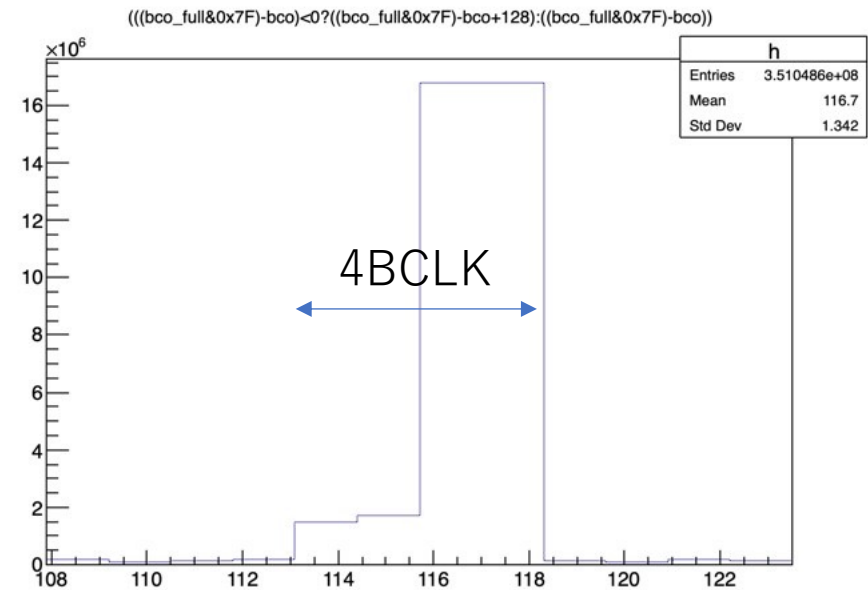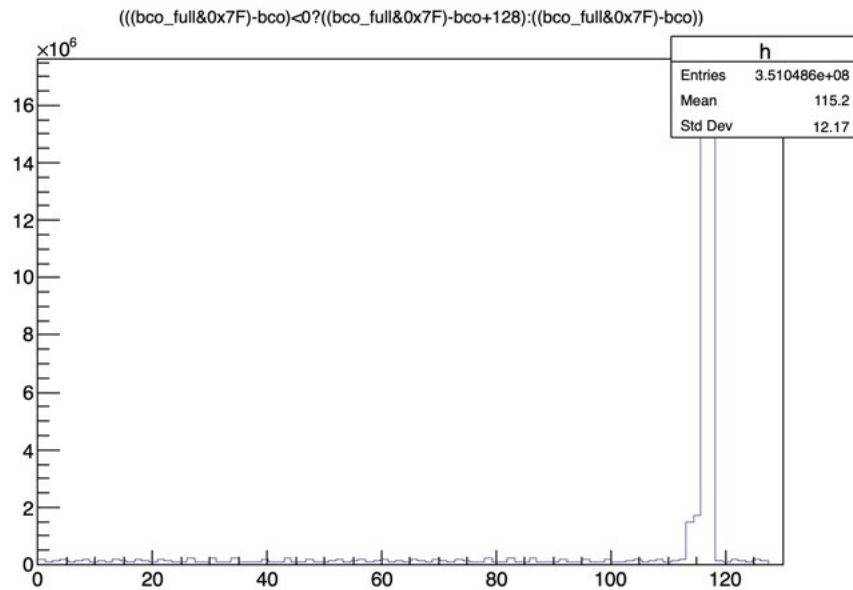# bco_full – bco distribution on other felixs (Run#9328)

n_collision=4
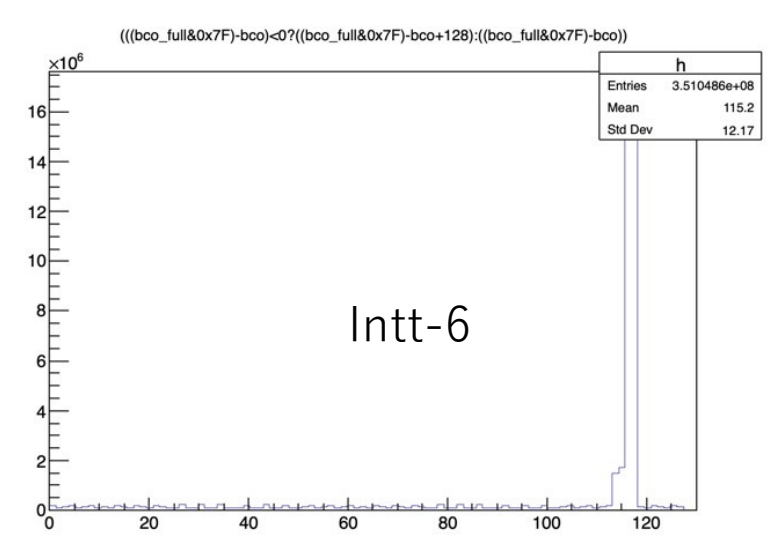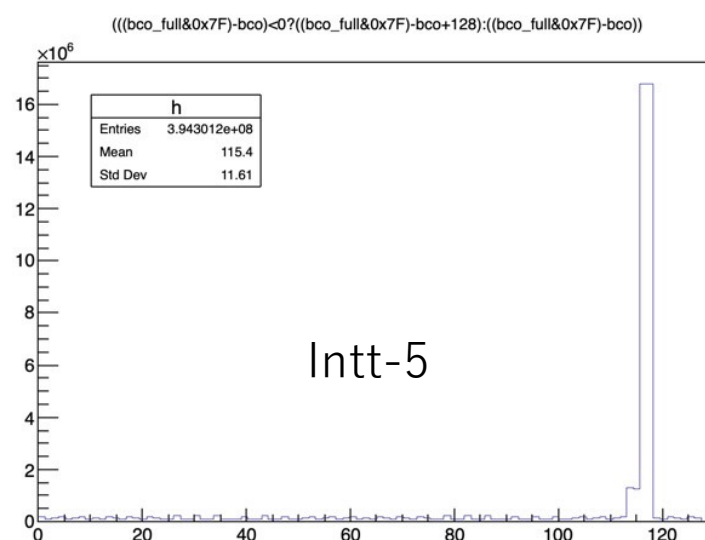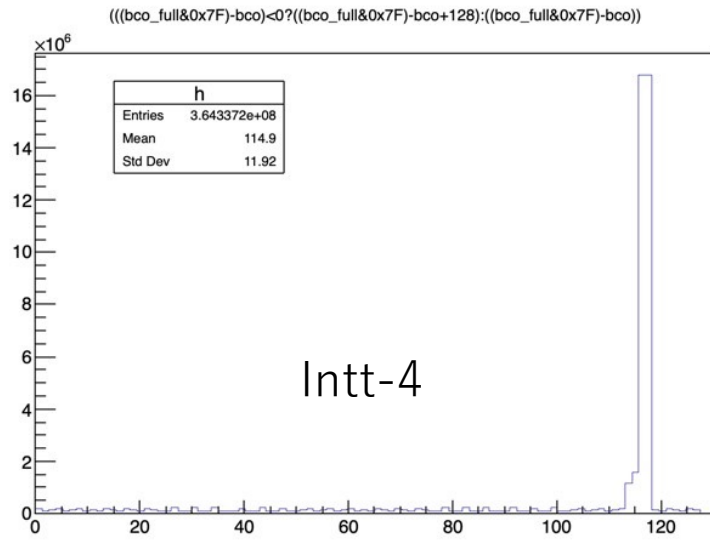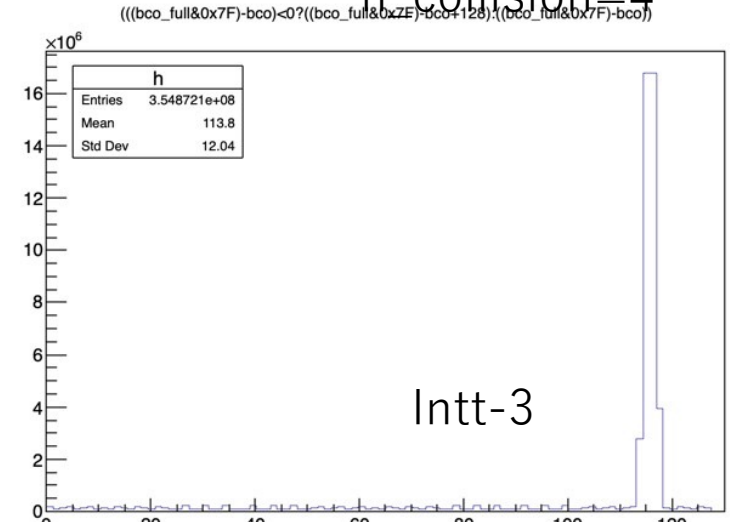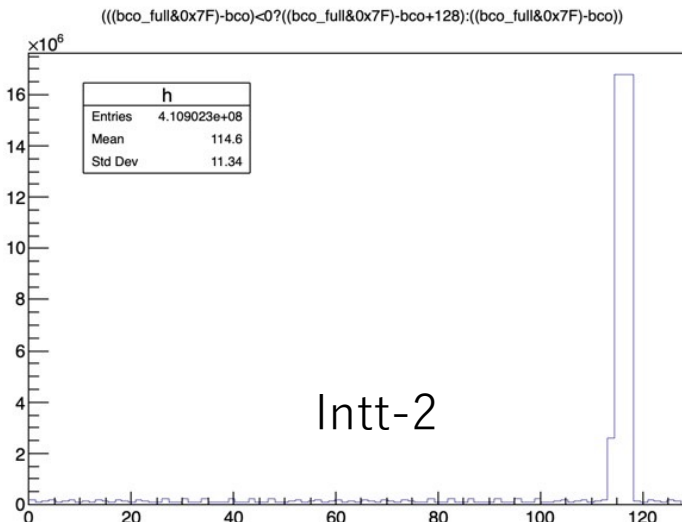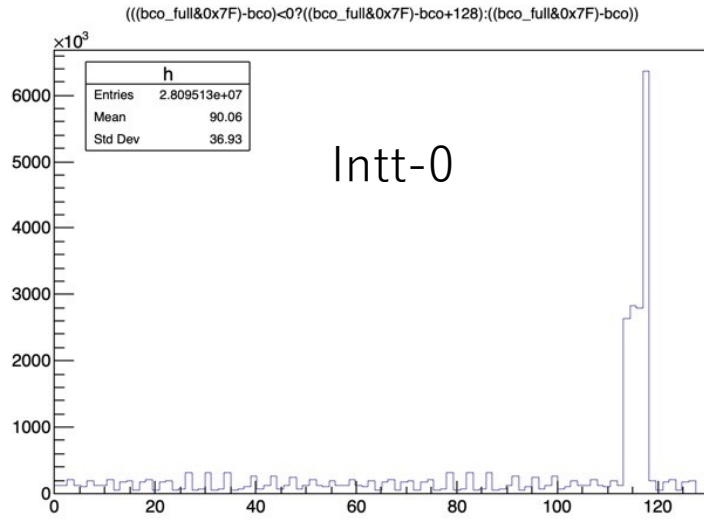
Same tendency.
Different number of events between different felixs which should not be.

Intt-7 BCO Peak with zoomed up

$(((bco\_full\&0x7F)-bco)<0?((bco\_full\&0x7F)-bco+128):((bco\_full\&0x7F)-bco))$

h	
Entries	3.510486e+08
Mean	115.2
Std Dev	12.17

$(((bco\_full\&0x7F)-bco)<0?((bco\_full\&0x7F)-bco+128):((bco\_full\&0x7F)-bco))$

h	
Entries	3.510486e+08
Mean	116.7
Std Dev	1.342

4BCLK

Most of the peaks are ~3 BCLK. Some felix has even more than 4BCLK.
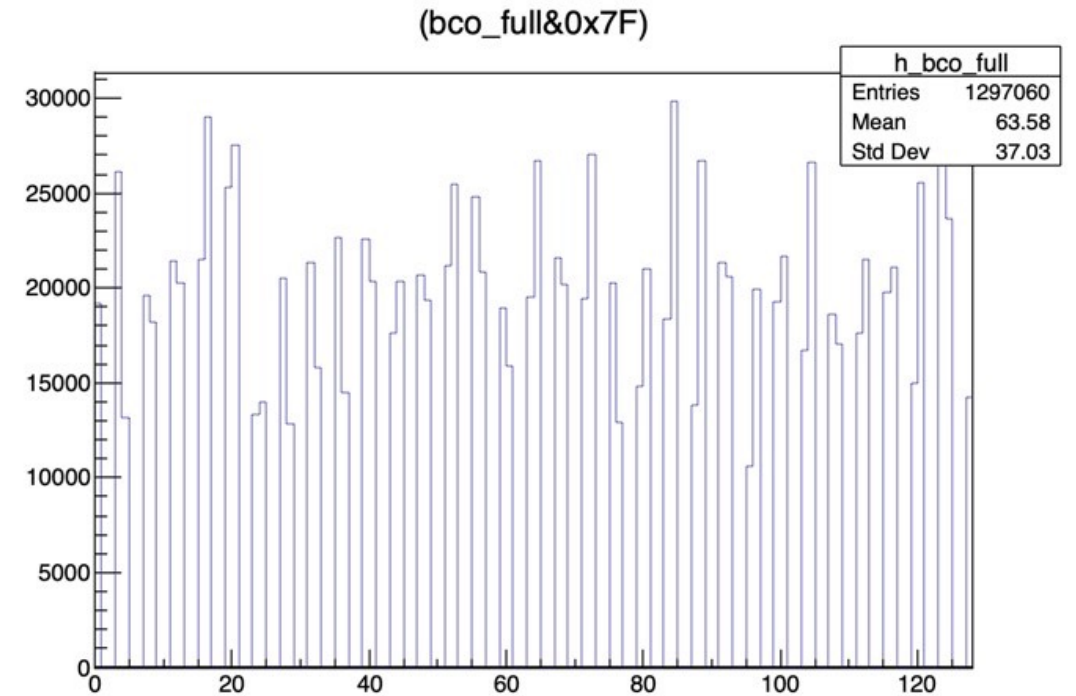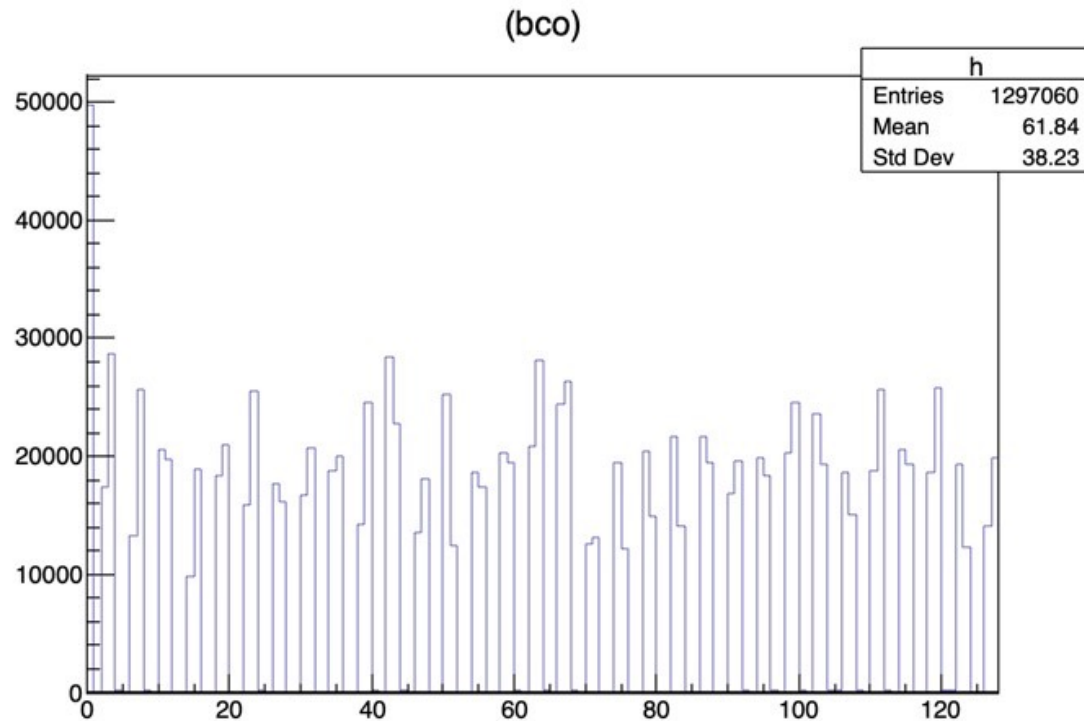
bco_full – bco distribution on other felixs (Run#9177)
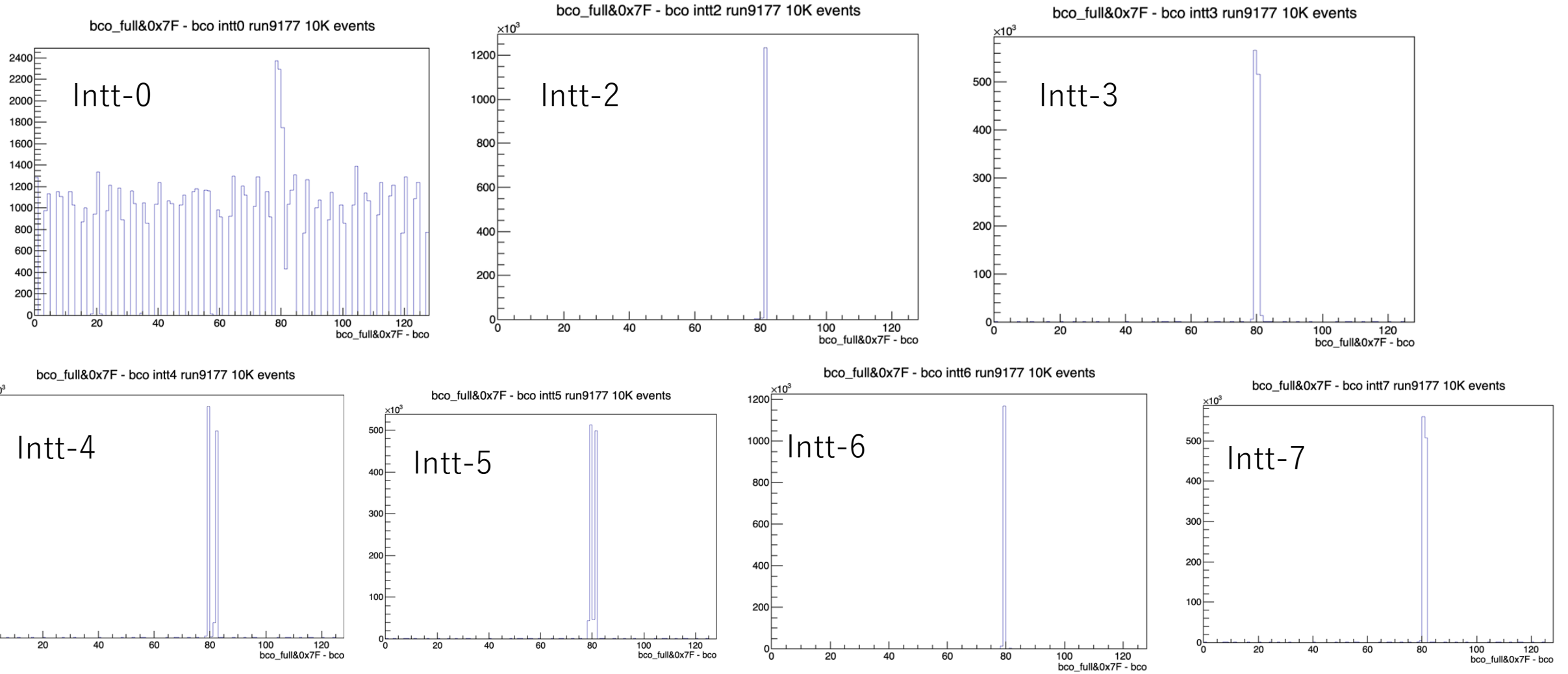
Narrower peaks (~2 BCLK) for intt2, 3, 6 and 7 than the run with n_collision =4.
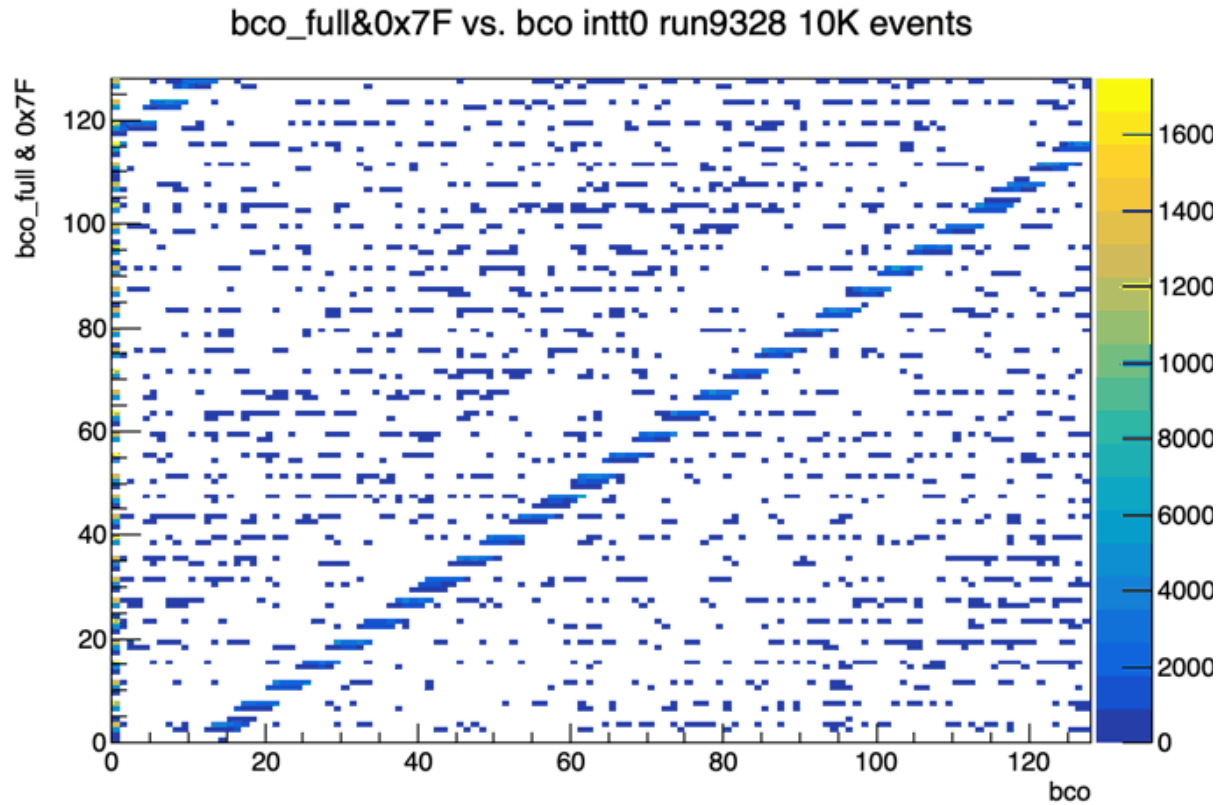
Run#9177 intt2
n_collision=0, modebit 76:0x35

(bco)

h	
Entries	1297060
Mean	61.84
Std Dev	38.23

(bco_full&0x7F)

h_bco_full	
Entries	1297060
Mean	63.58
Std Dev	37.03

A lot of bco are 0.
Run #9328 shows same tendency.

Correlation of bco_full and bco

bco_full&0x7F vs. bco intt0 run9328 10K events

Run 9328
n_collision = 4
Intt0
# of events =10K

The correlation can be seen.
A lot of background there.

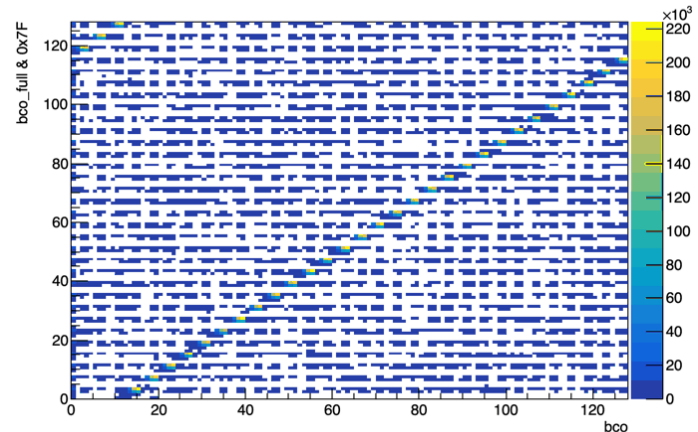Correlation of bco_full and bco Run 9328 n_collision =3
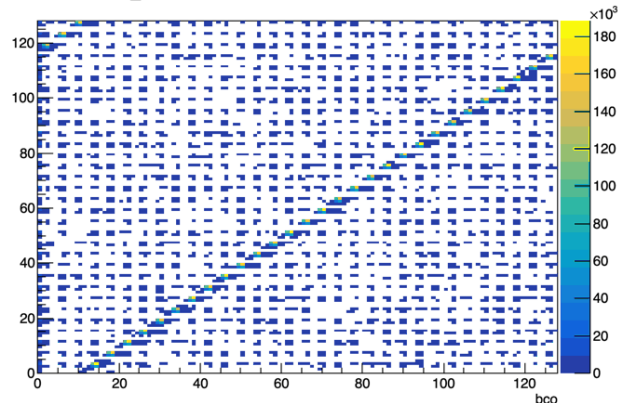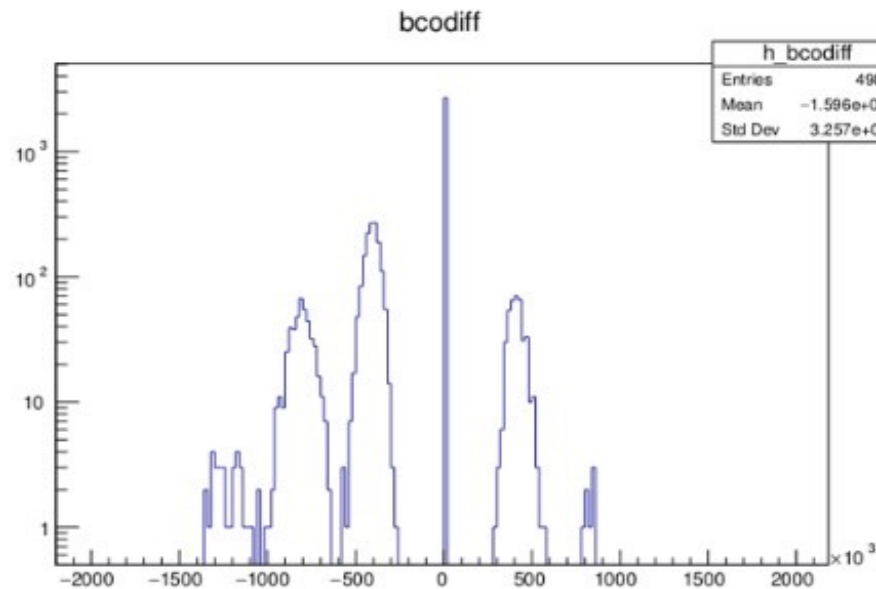
bco_full distribution at the same events.
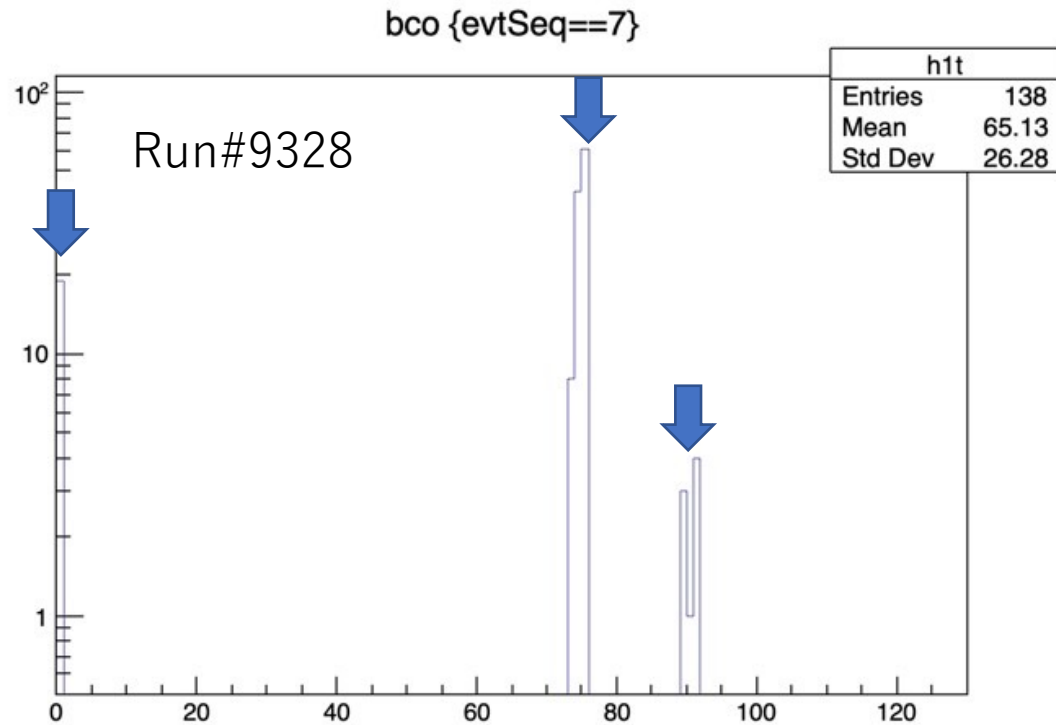

Run 9185-0
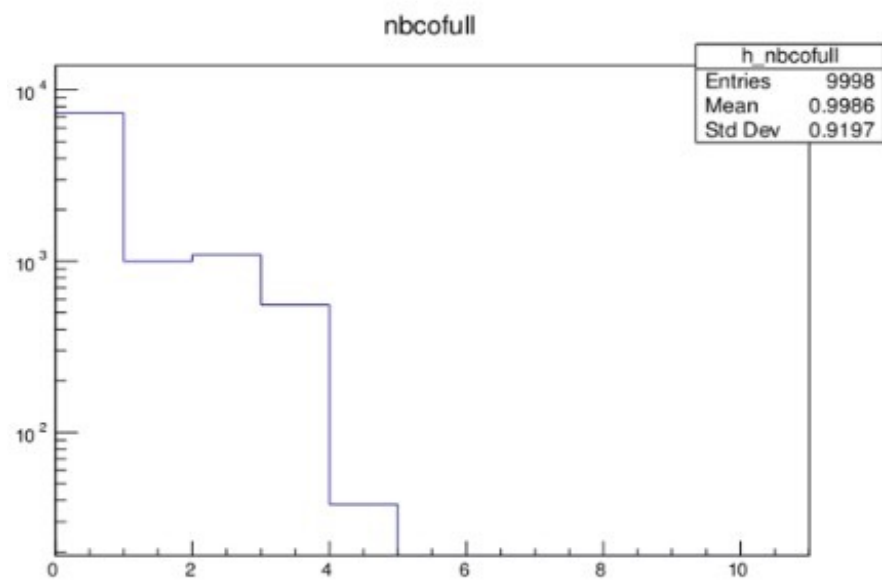
BCOdiff = BCOFULL – BCOFULL_MAIN

- NBCO=0をのぞくと、　両方のエントリーは同じになりそう。

BCO Structure in a Given Event

Multpilpe BCO hits in a given event

bco {evtSeq==7}

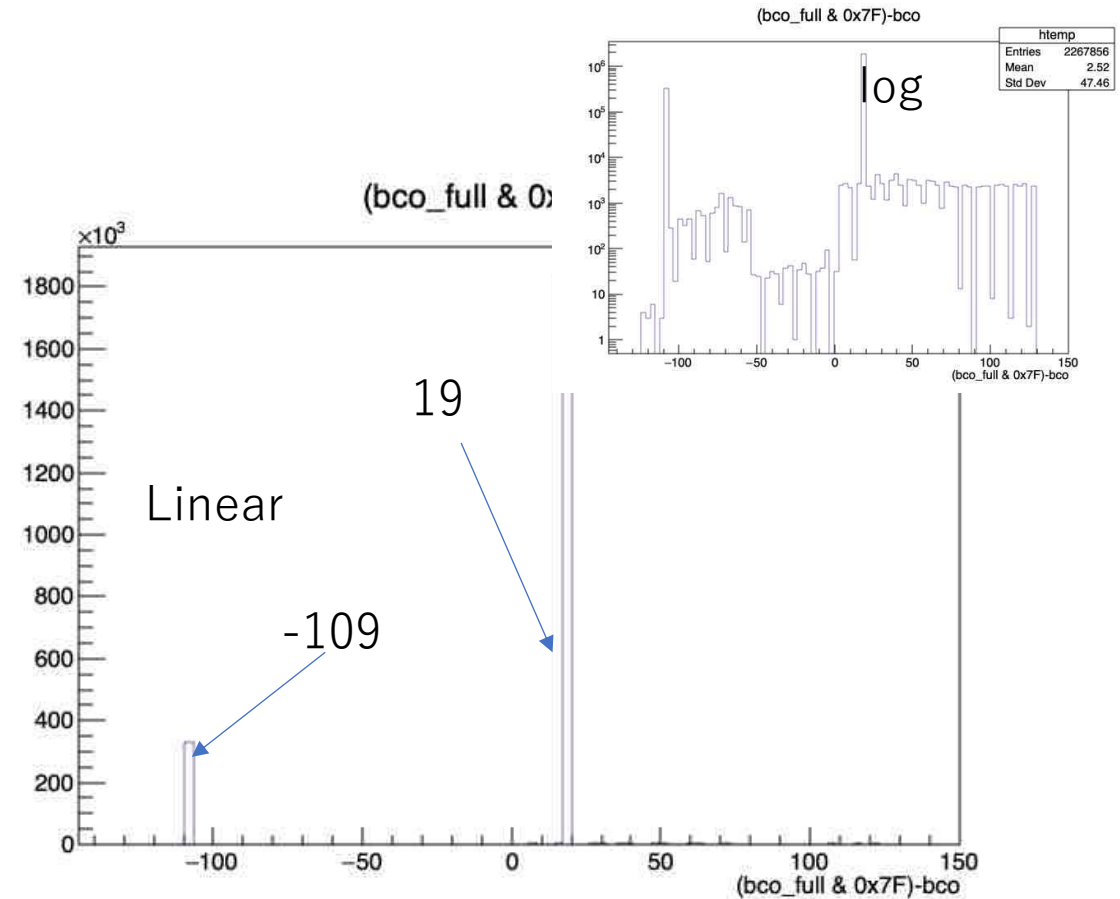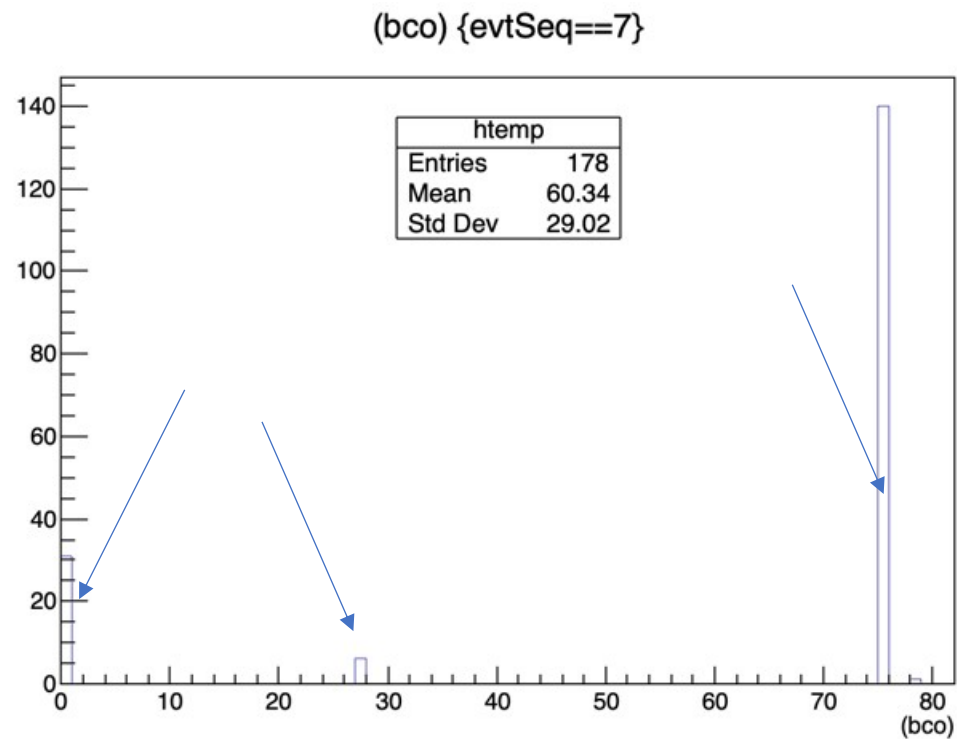| h1t	
Entries	138
Mean	65.13
Std Dev	26.28

Run#9328

evtSeq ==7 of intt2

- Timed-in, n_collision=4
- Split into multiple peaks somehow.
- # of events in INTT are factor of 3~4 larger than these of MBD.

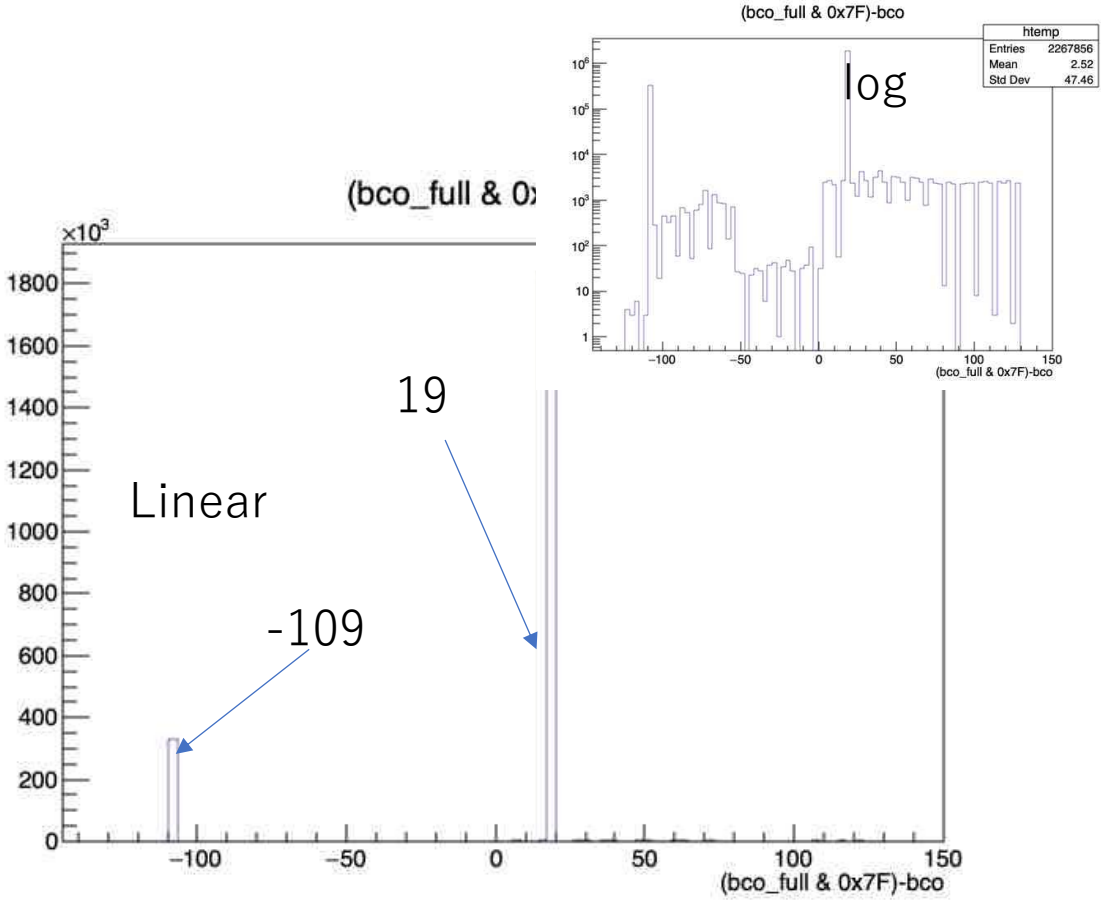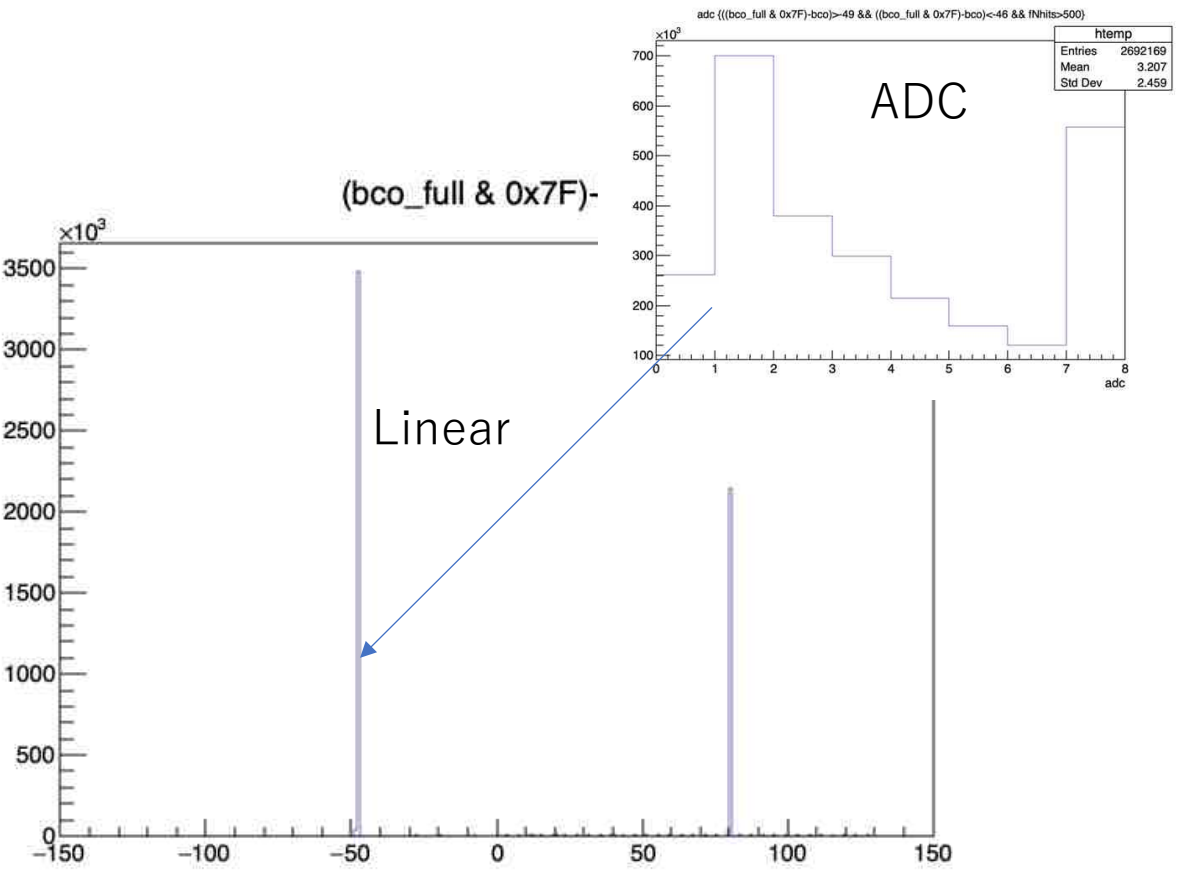# Back Up

FPHX-BCO and Full-BCO Correlation

Main and sub-peaks fraction varies

Run#9177: L1Delay=25,n_collision=0, open time=35, 76:0x35

Run#8059: L1Delay=25,n_collision=54,open time=35, 2:0x33

13

FPHX-BCO and Full-BCO Correlation

Run#8020: L1Delay=0,n_collision=127, open time=120   Run#8059: L1Delay=25,n_collision=54,open time=35

Plot by Takashi