INTT calibration module update

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InttCalib.cc/h

Calibration module in coresoftware
InttCalib.cc/h
Provides HotChannel list & BCO peak(offset with respect to GL1)

Update : Change the histogram auto-range determination method
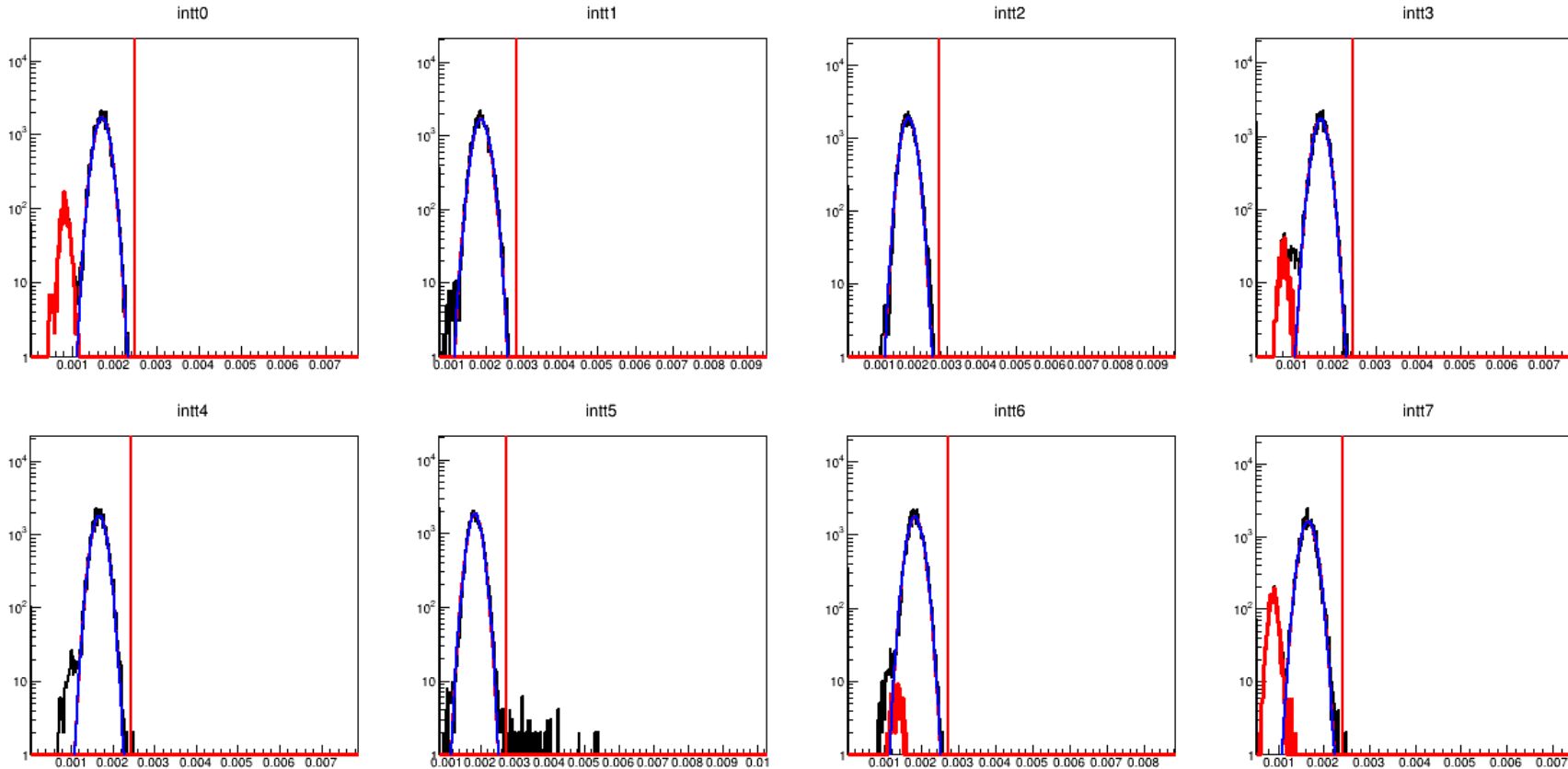
List of output

HotChannel
CDBTTree (.root) / hitrate distribution (.png)
BCO difference(offset)
CDBTTree (.root) / BCO diference distribution (.png)

Hot channel criteria

Run: 00048513 Events: 50000
Fraction Cold: 0.000%
Fraction Hot: 0.056%

Current criteria to determine hot channel list

Gaussian fit FELIX server by server with data driven method

Radii of barrels / chip size taken in the normalization

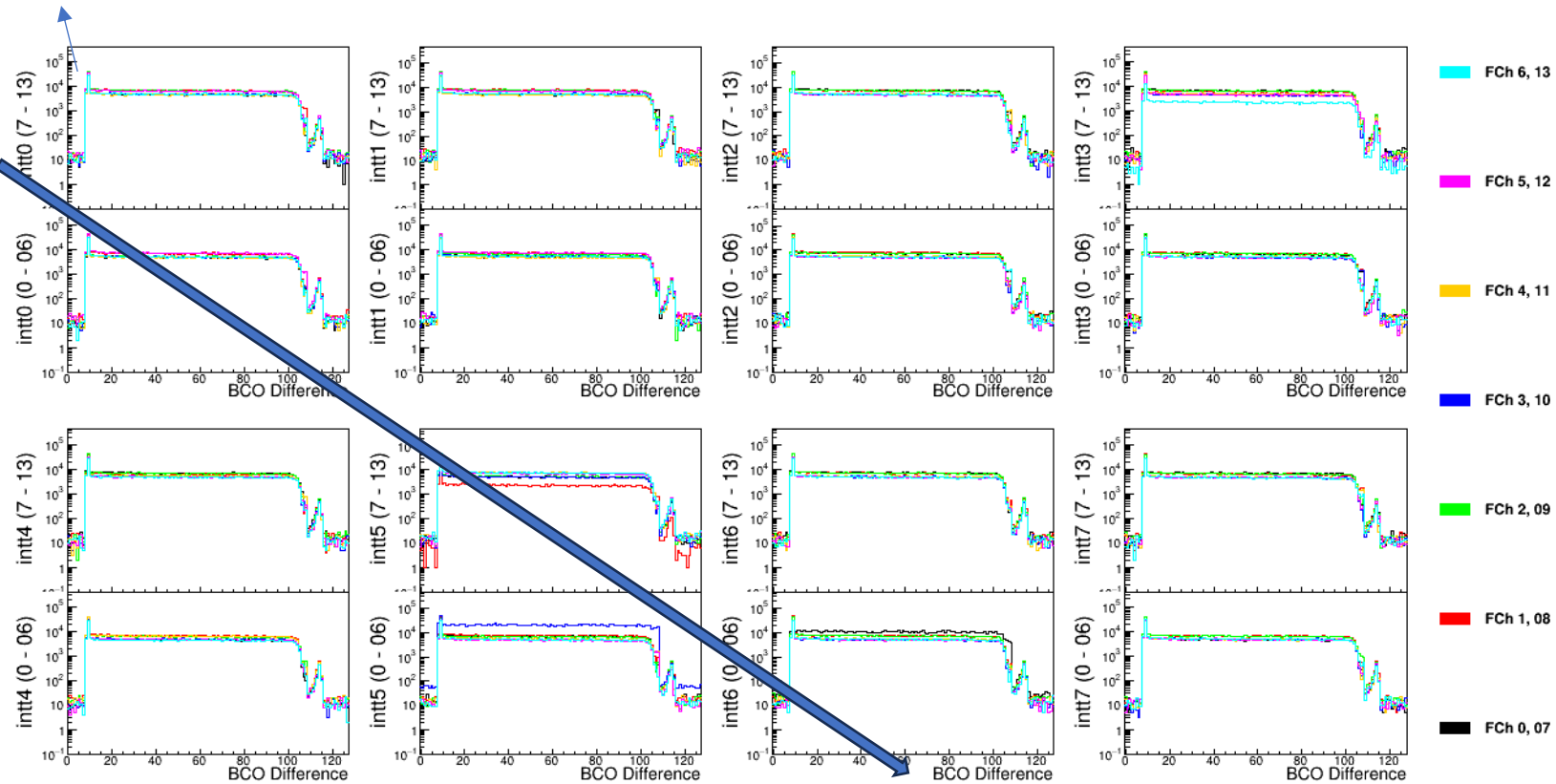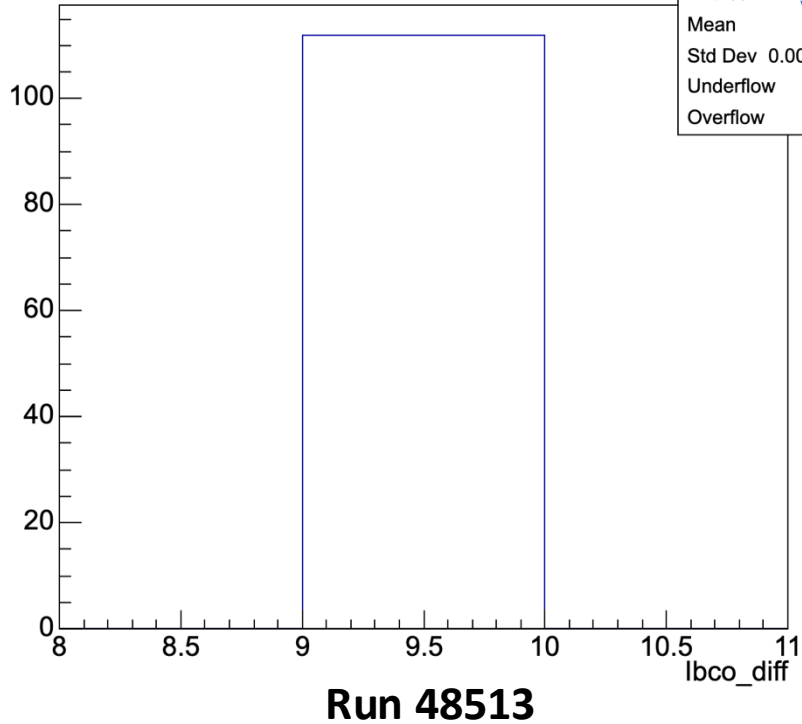$\mu + 5\sigma < hitrate(\# \ hits \ per \ evt)$ used to classify hot channel and save the list in CBTTree format

Half entry chips / cold / dead channels are not masked for the time being as discussed in past INTT meeting

red Hitrate distribution in each plot representing half entry chips.
Algorithm for half entry chips has to be confirmed more.
Noting to do for masking for now.

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BCO difference (offset) distribution

Every FC has BCO peak at 9

Run 48513

Run: 00000000 Events: 50000 BCO StdDev: 0

GOOD

Run 48513

Note : Convention has been changed
From:
   ((intthit->get_bco() & 0x7fU) - intthit->get_FPHX_BCO() + 128) % 128
To:
   (intthit->get_FPHX_BCO() - (intthit->get_bco() & 0x7fU) + 128) % 128

Check the StdDev from BCO offset branch.
If value is 0 ; indication all FC are aligned.
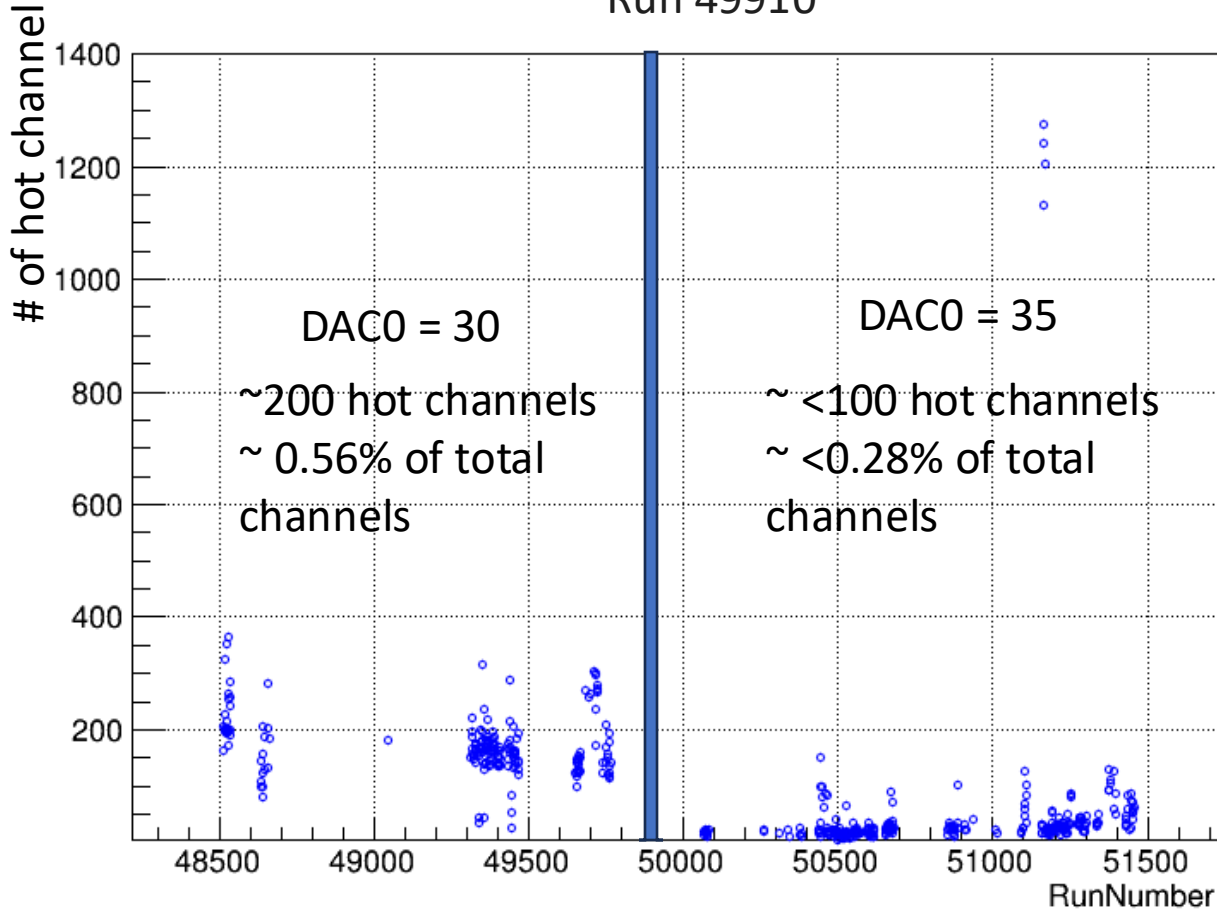Tagged as GOOD!

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Hot channel stability

Run 51162 ~ 51167 has too many hot channels!

minimum # of event > 40k required
All FC aligned within 1 BCK required

In INTT RunLog
(Thanks for multiple manager!)

Run 49910

DAC0 = 30

~200 hot channels
~ 0.56% of total channels

DAC0 = 35

~ <100 hot channels
~ <0.28% of total channels

Confirmed that algorithm is working properly based on the stability check
- Can see reasonably similar # of hot channels

- Can see the dependency on DAC0

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Summary

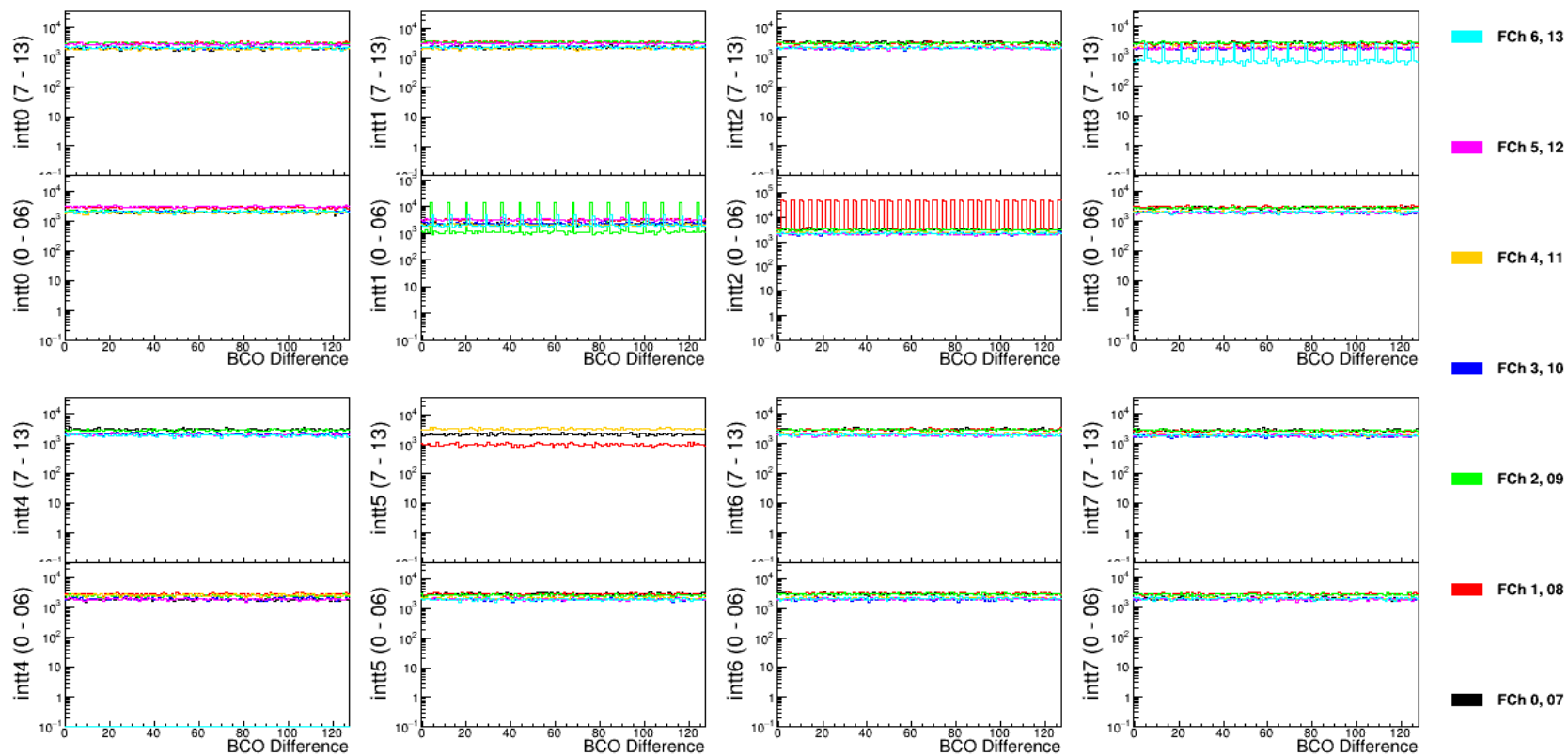InttCalib.cc/h module has misc. update and want to pull the new code in coresoftware

- Will produce (only) Hot channel list and BCO offset(for trigger mode).

Joseph wants to work on Calibration module; idea is separating one module into two, one is for hot channel, the other is for BCO.

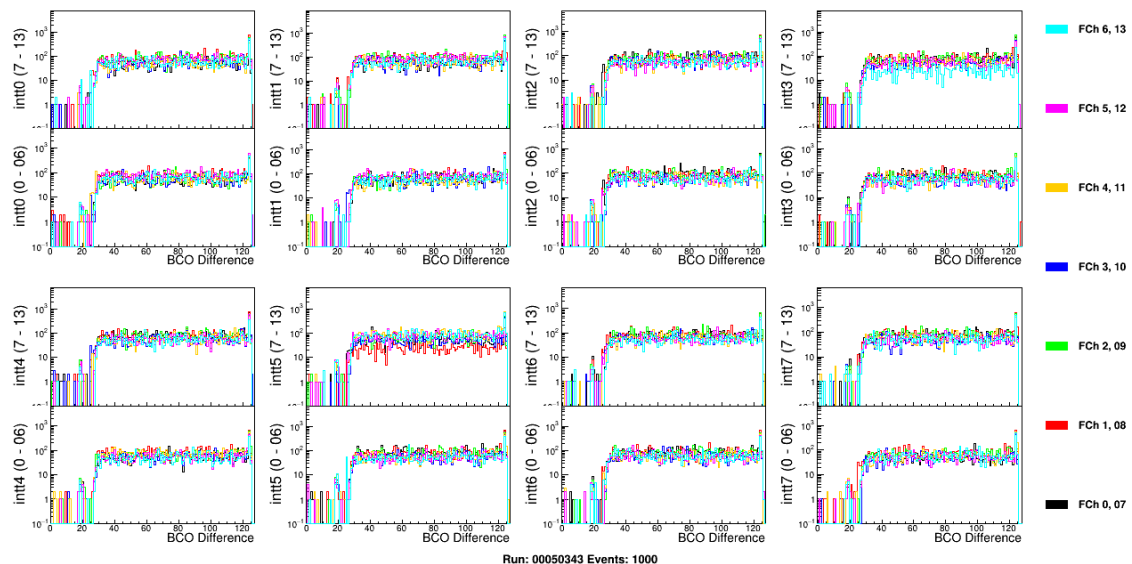- We will keep this module for upcoming approval; some users may want to use new algorithm(recommended)
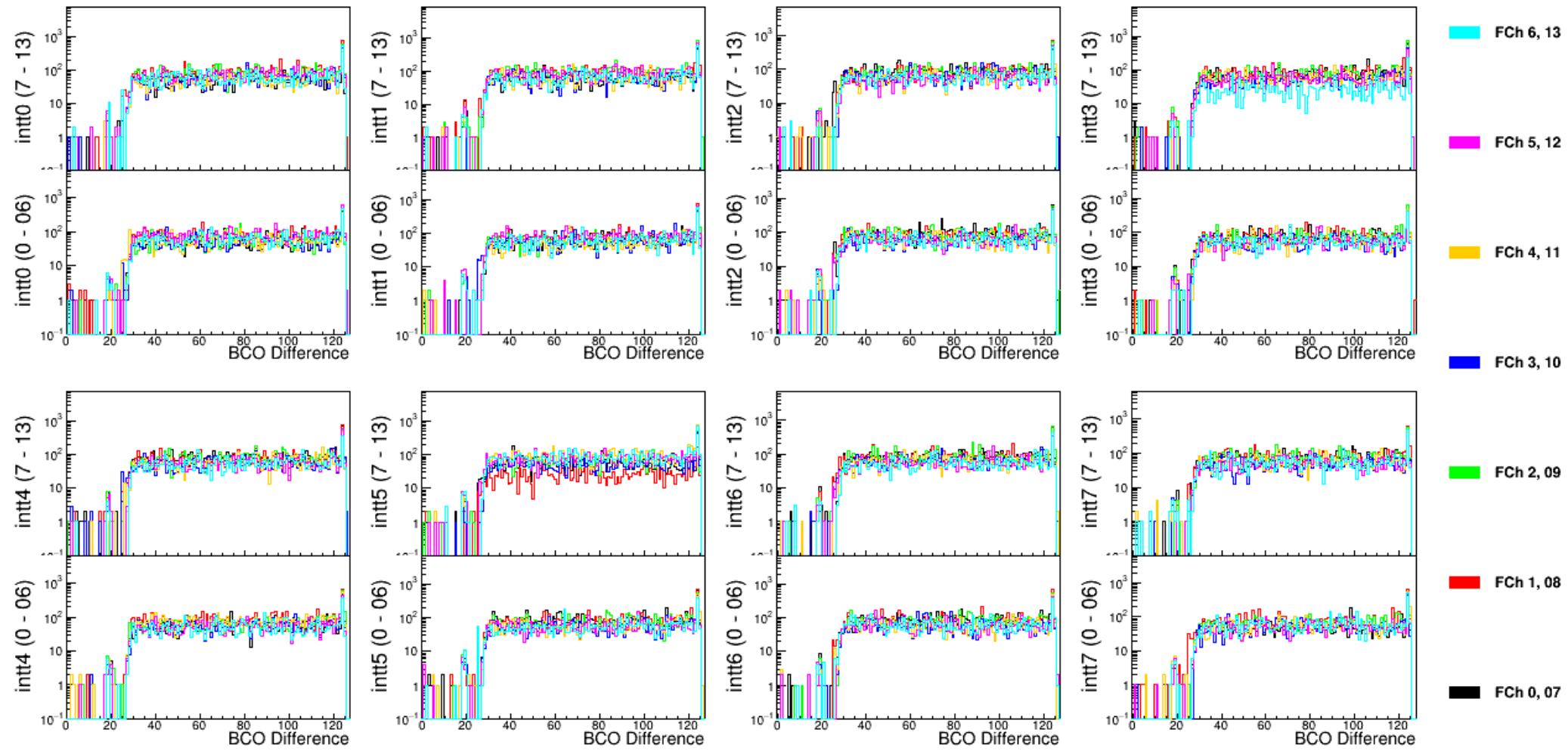
BACKUP

Streaming readout

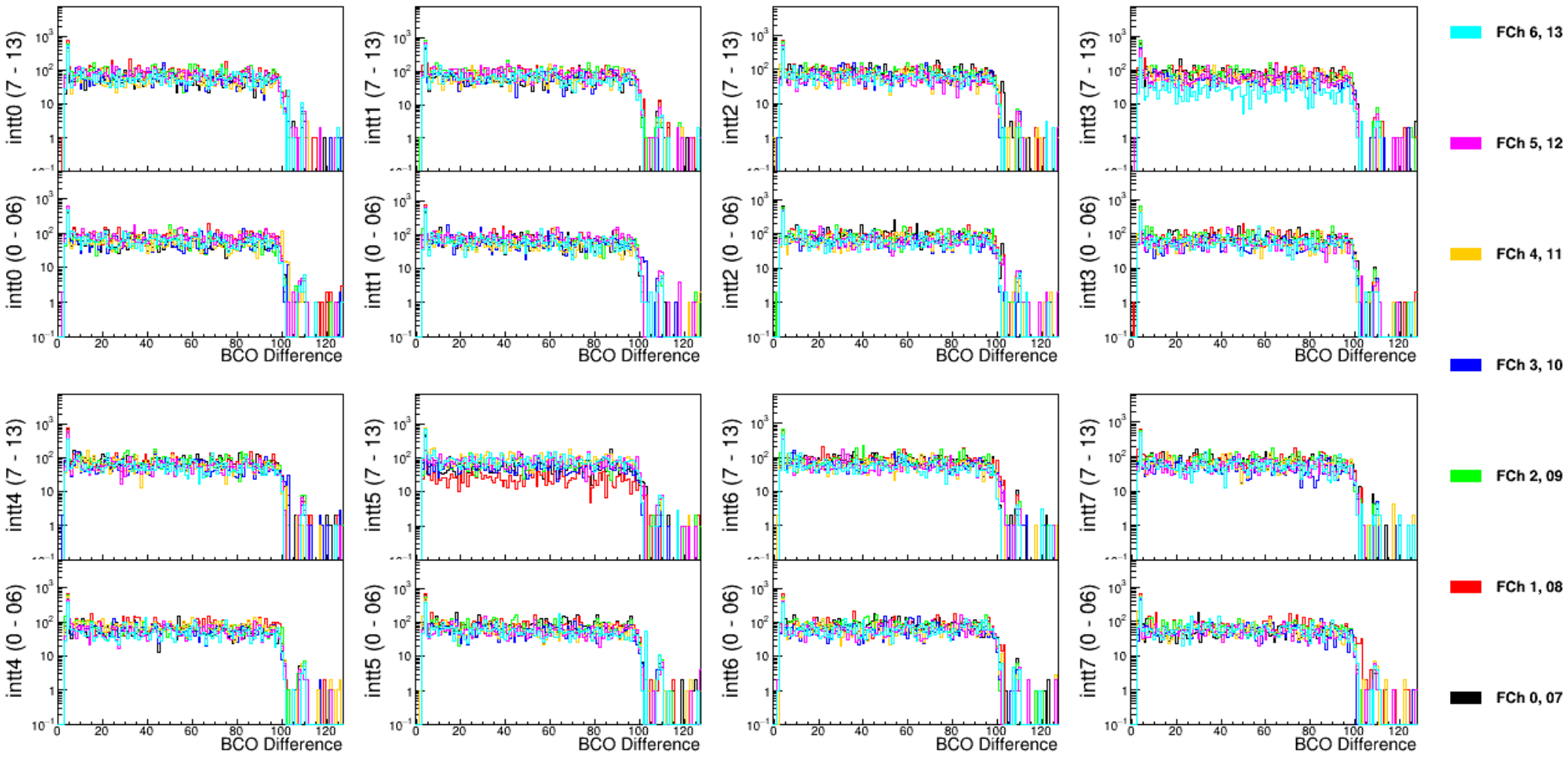Run: 00000000 Events: 50000 BCO StdDev: 38

Run 52060 FEE MISALIGNED!!

BACKUP

Run: 00050343 Events: 1000

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BACKUP BEFORE Convention change

Run: 00050343 Events: 1000

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BACKUP AFTER Convention change

Run: 00050343 Events: 1000