

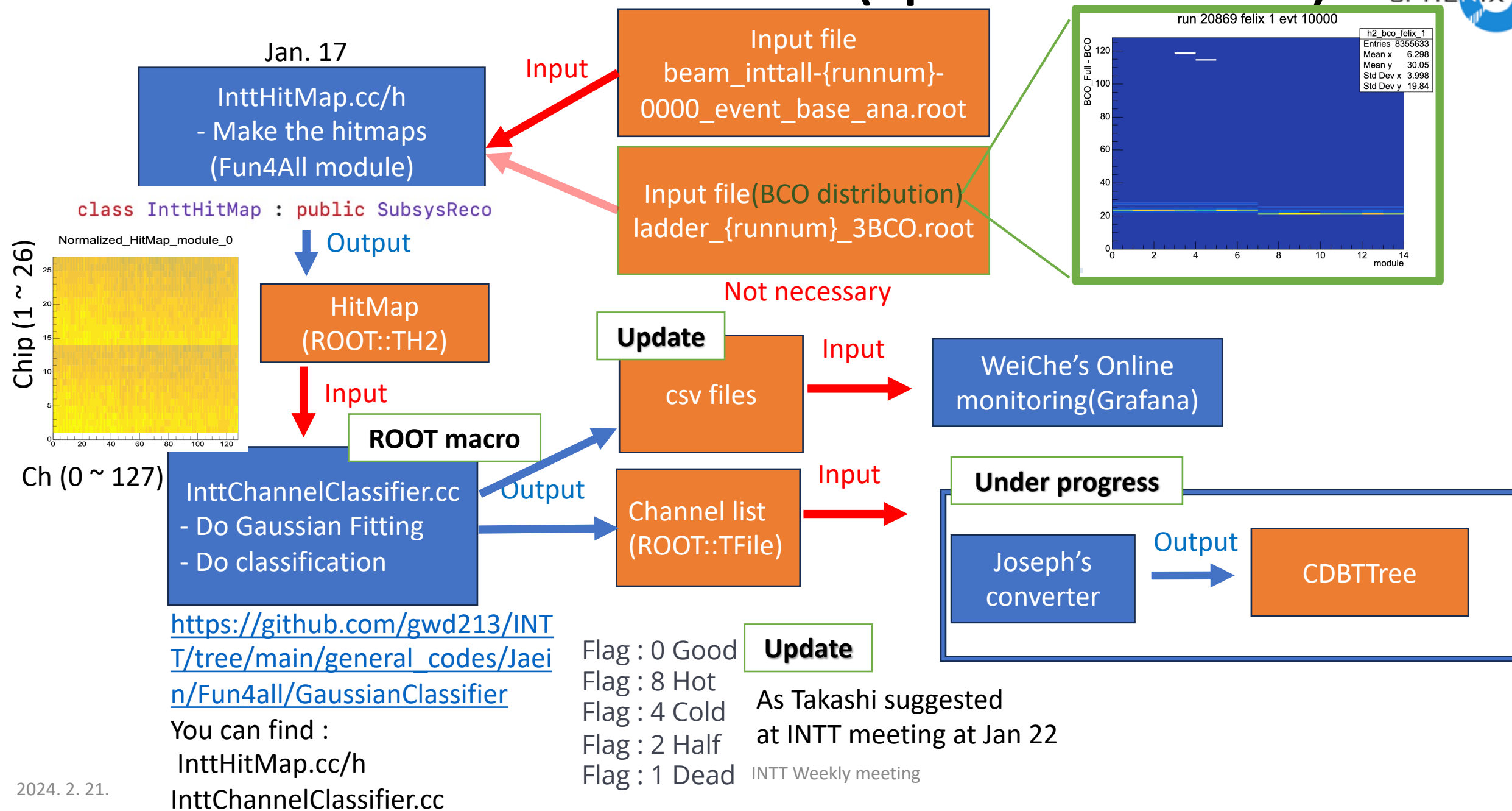
Status of BCOFinder/ChannelClassifier

Jaein Hwang
Byungsik Hong

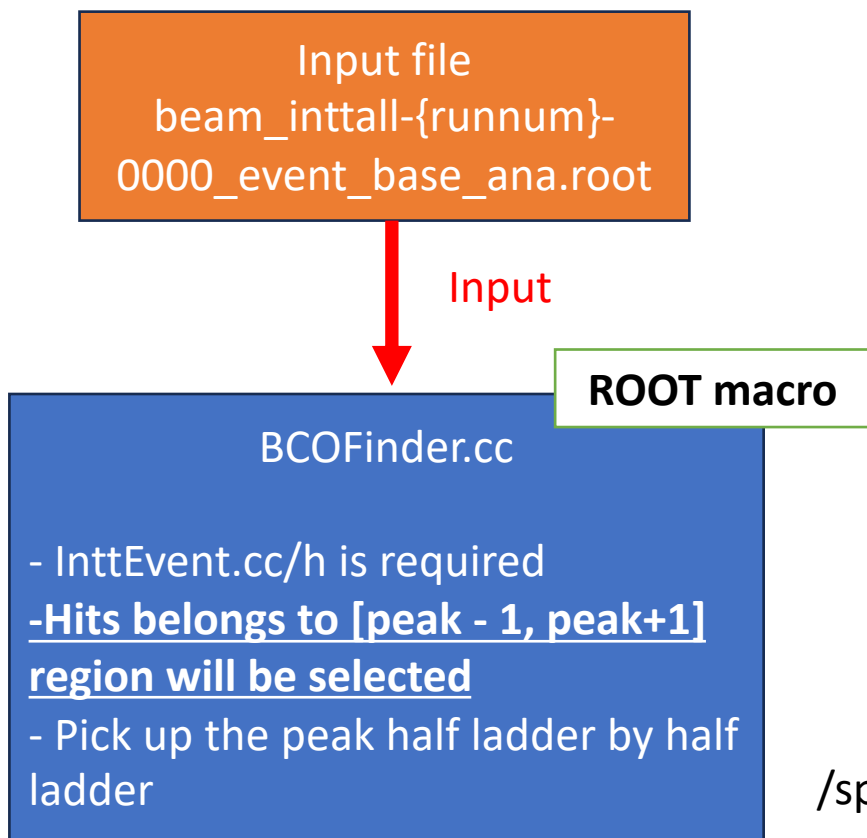


https://github.com/gwd213/INTT/tree/main/general_codes/Jaein/Fun4all/GaussianClassifier

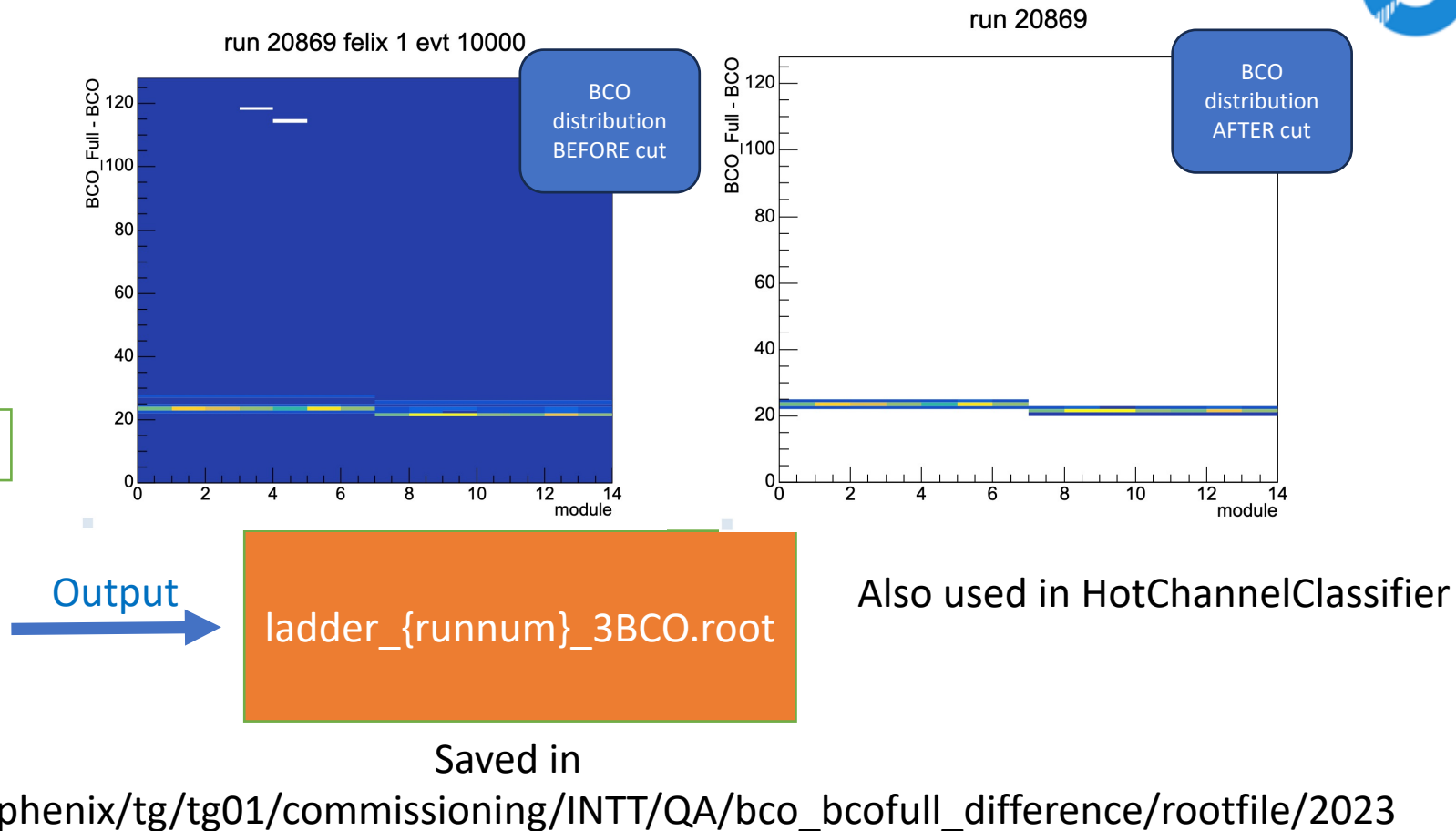
Structure of Hot channel classifier (updated on Feb 21)



Structure of BCOFinder



https://github.com/gwd213/INTT/tree/main/general_codes/Jaein/BCOFinder



```
-bash-4.2$ pwd
/sphenix/tg/tg01/commissioning/INTT/QA/bco_bcofull_difference/rootfile/2023
-bash-4.2$ ls
ladder_20864_3BC0cut.root  ladder_20880_3BC0cut.root
ladder_20867_3BC0cut.root  ladder_20881_3BC0cut.root
ladder_20868_3BC0cut.root  ladder_20883_3BC0cut.root
ladder_20869_3BC0cut.root  ladder_20885_3BC0cut.root
ladder_20878_3BC0cut.root  ladder_20888_3BC0cut.root
```

Summary



- FUN4All based HitMap generator and ROOT based Classifier have published with additional comments inside the codes.

https://github.com/gwd213/INTT/tree/main/general_codes/Jaein/Fun4all/GaussianClassifier

- ROOT based BCO peak Finder has published.

The output root file is saved in

`/sphenix/tg/tg01/commissioning/INTT/QA/bco_bcofull_difference/rootfile/2023.`

```
-bash-4.2$ pwd
/sphenix/tg/tg01/commissioning/INTT/QA/bco_bcofull_difference/rootfile/2023
-bash-4.2$ ls
ladder_20864_3BC0cut.root  ladder_20880_3BC0cut.root
ladder_20867_3BC0cut.root  ladder_20881_3BC0cut.root
ladder_20868_3BC0cut.root  ladder_20883_3BC0cut.root
ladder_20869_3BC0cut.root  ladder_20885_3BC0cut.root
ladder_20878_3BC0cut.root  ladder_20888_3BC0cut.root
```

Now all Zero Field run bco file are available.

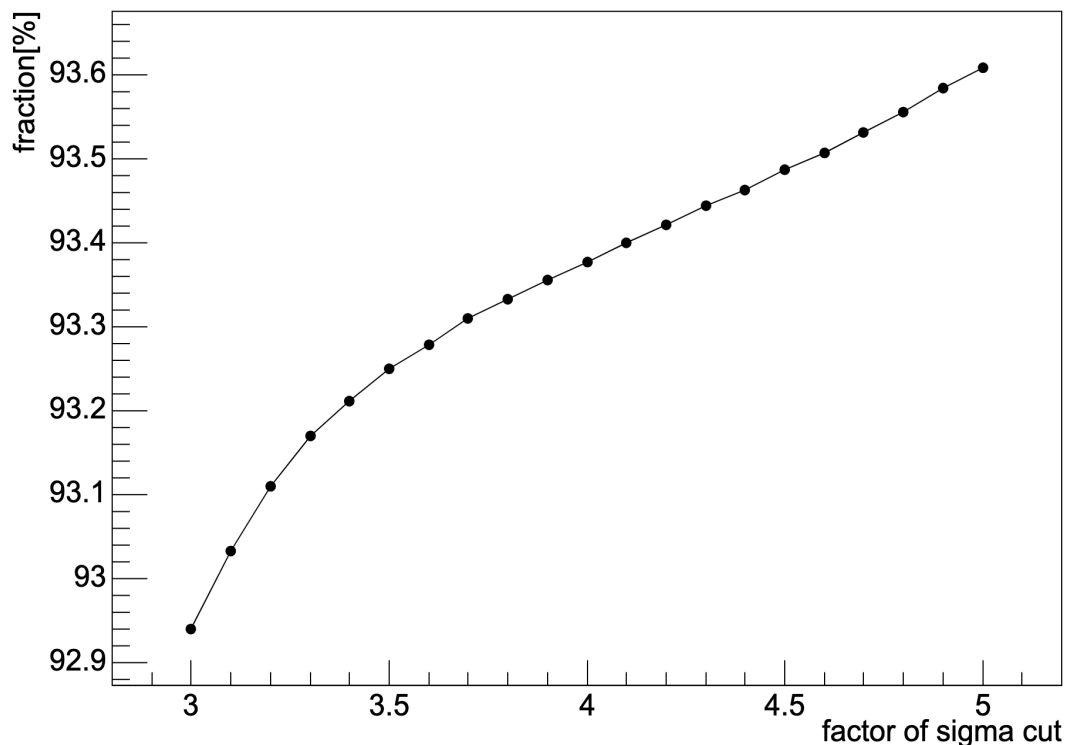
Q. Do we also have to handle bco peak information with CDBTree format?

Q. Is the overview structure of Hot Channel Classifier OK?

backup

Fraction of channels vs sigma[$3\sigma \sim 5\sigma$]

Fraction of good channels : Run 20869



(3 sigma to 5 sigma 0.67% increasing)

Fraction of cold/hot channels

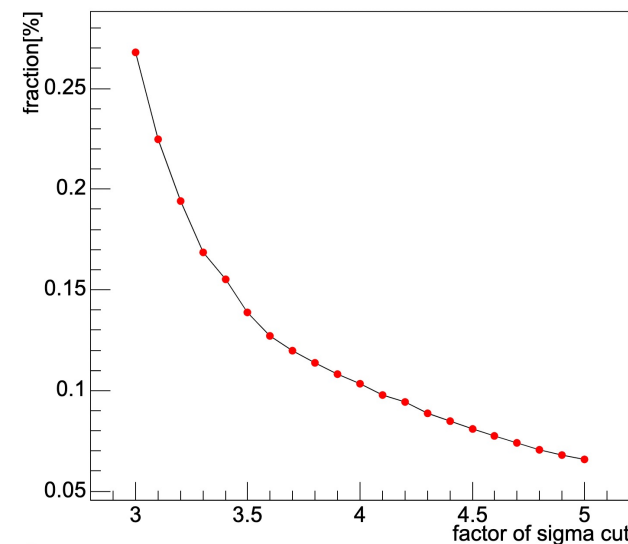
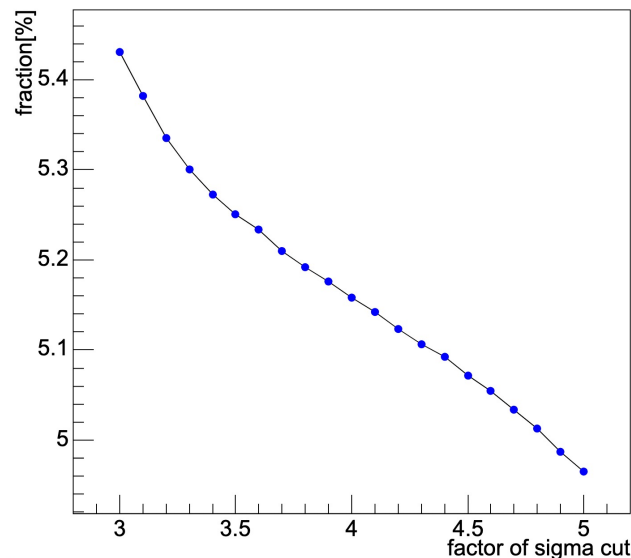


Table 1. fraction of classified channels

tag	3σ	3.5σ	4σ	4.5σ	5σ
GOOD	92.94%	93.25%	93.38%	93.49%	93.61%
COLD	5.43%	5.25%	5.16%	5.07%	4.96%
HOT	0.27%	0.14%	0.10%	0.08%	0.07%
DEAD	1.36%	1.36%	1.36%	1.36%	1.36%

Hot Channel algorithm

Reminder : Procedure of hot channel classifier

1. Make a normalized hit map distribution
normalized by :
- number of event
- Acceptance difference depending on the chip type
(Type A and Type B) and layer (inner and outer)

2. Draw Hit rate distribution for every half ladders.

Each half ladder have two hit rate distributions, one is distribution of Type A,
the other is for Type B.

3. Definition of channel

Hot Channel : mean + 3sigma

Cold Channel : mean - 3sigma

Dead Channel : 0 hit

