

# Development of the hot channel algorithm

Jaein Hwang  
(Korea University)

[Establish the hot channel list]

---

**Goal in this workshop:** Establish the hot channel list specially for zero field run

## My To-Do List

- ~~Find a new fitting parameter with BCO cut to reduce the noise effect (done)~~
  - Modify the code to fit our software framework
  - Compare the hot channel lists with Yuka(remote) and Joseph
    - Generally, Yuka and I have developed the hot channel algorithm with the same logic.
    - Joseph uses different logic to determine the hot channel. – We should compare to each other
  - Check the stability of the hot channel to find the minimum required events to determine the hot channel
    - One of the easiest way to check the stability of channels is hit rates as a function of events(time).
    - If the variation of hit rates is not so huge, then next question is “how many events do we need to determine the hot channel list?”
    - Make a hot channel list with 1k events, 10k events.. Compare to hot channel lists with total events. (0~10000evt, 10000~20000evt)
- Prepare thesis topic presentation Nov. 10<sup>th</sup>

# Comparison hot channel lists

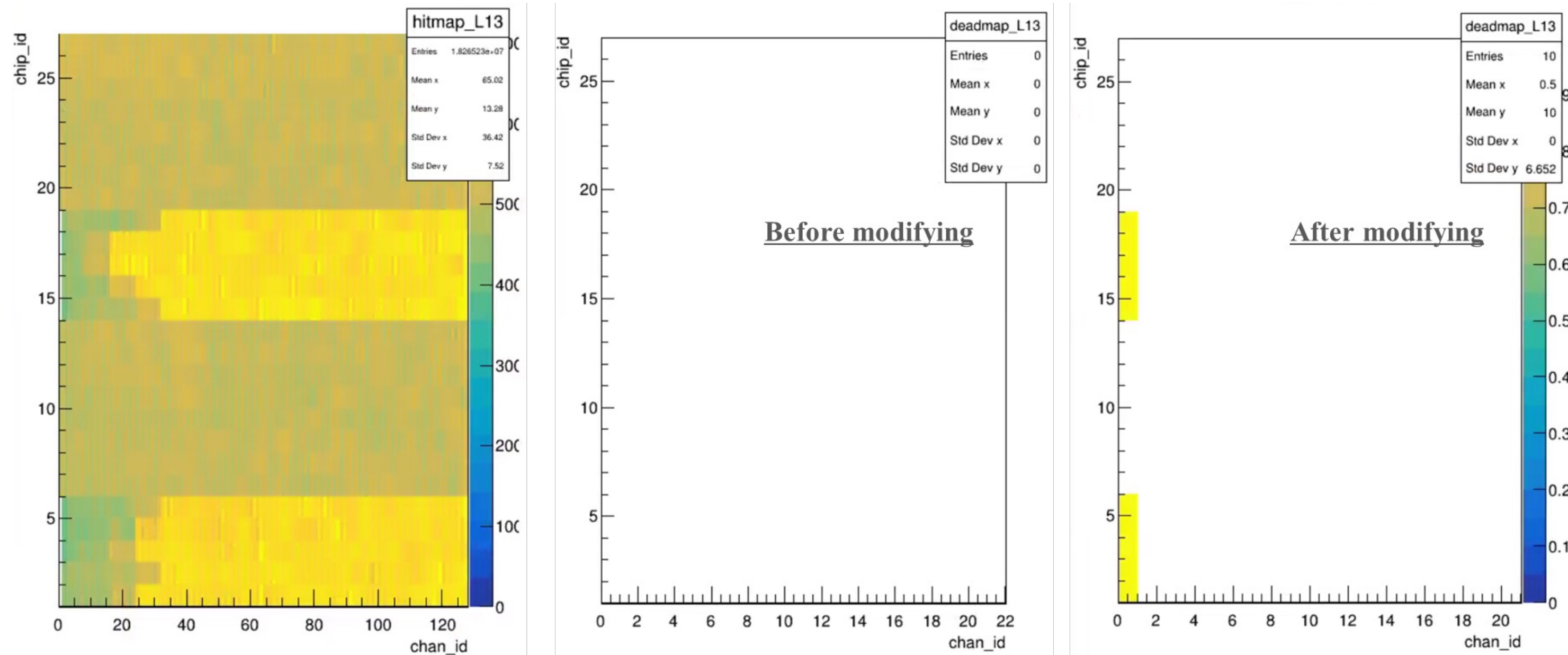
Jaein Hwang  
(Korea University)

- During the hot channel comparison, we found some bugs on our code.

Ex) We realized that the # of dead channel from Yuka's and Jaein's hot channel lists were not consistent with each other.

The reason is Yuka's algorithm didn't count the 0 hit channel as the dead channel.

- Check and fix the bug on our code is ongoing.



81 # of **hot** channels only peaked up by Jaein  
 82 # of **hot** channels only peaked up by Yuka  
 5987 # of **hot** channels peaked up by both of us.  
 7 # of **cold** channels only peaked up by Jaein  
 28 # of **cold** channels only peaked up by Yuka  
 9363 # of **cold** channels peaked up by both of us.

$$\frac{\text{Total} - (\text{Jaein}) \cap (\text{Yuka})}{(\text{Jaein}) \cup (\text{Yuka})} = \frac{(81 + 82)}{(81 + 82 + 5987)} = \frac{163}{6,150} \sim 0.027$$

$$\frac{\text{Total} - (\text{Jaein}) \cap (\text{Yuka})}{(\text{Jaein}) \cup (\text{Yuka})} = \frac{(7 + 28)}{(7 + 28 + 9363)} = \frac{35}{9,398} \sim 0.004$$