

# INTT weekly meeting

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**2021/07/13**

**Purdue University**

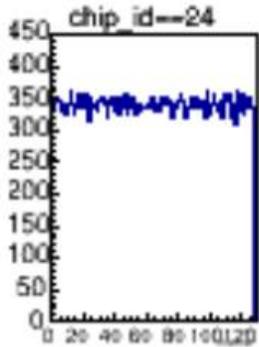
**Han-Sheng Li**

**PURDUE**  
UNIVERSITY

# Classification for ladders

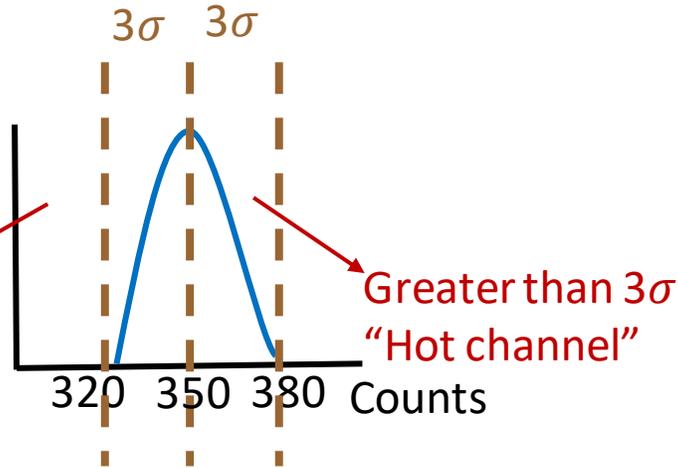
## STEP 1. Criteria for classifying ladders

Entry:



# of channel

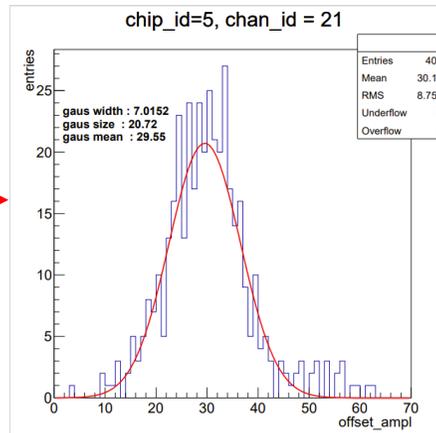
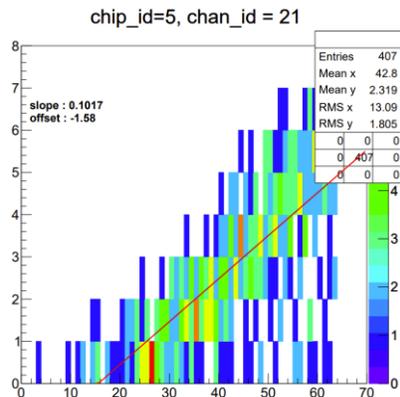
Less than  $3\sigma$   
"Dead channel"



Cheng-Wei's criteria (current criteria):

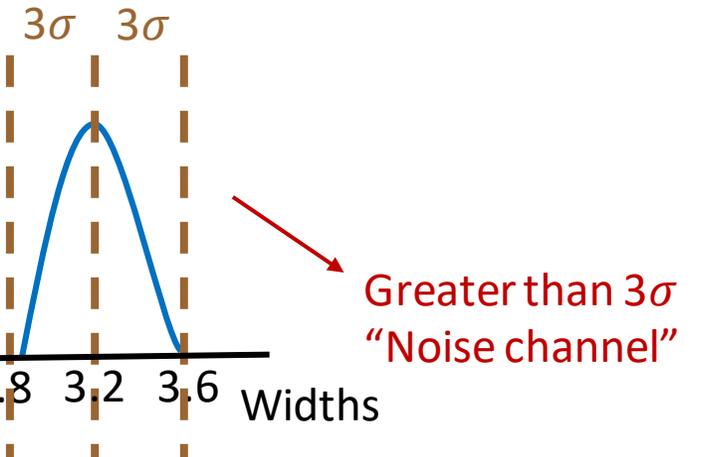
- For Entry:  $280 < \text{entries} < 400$
- For Noise: width of gaussian  $< 4$

Noise:



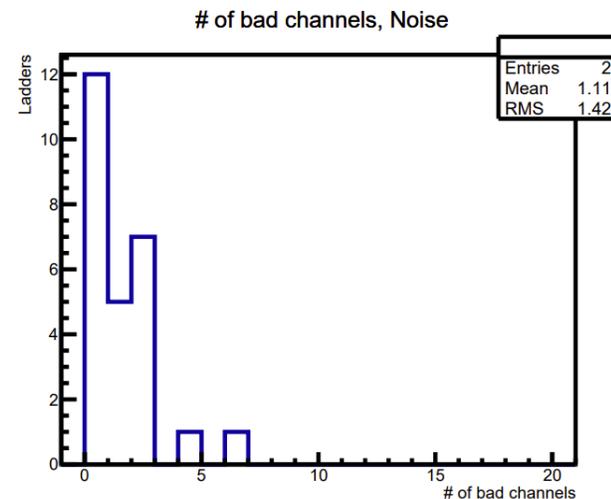
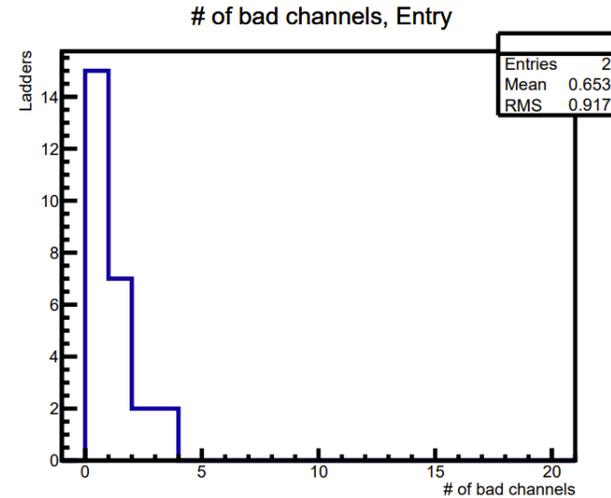
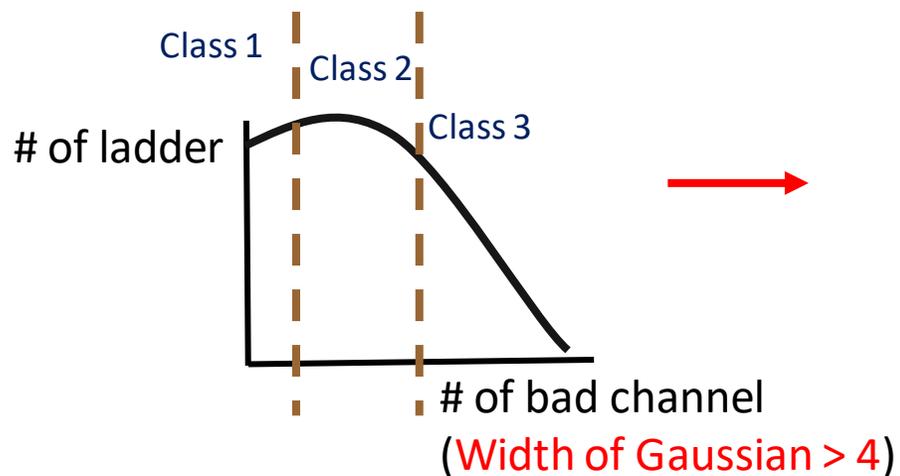
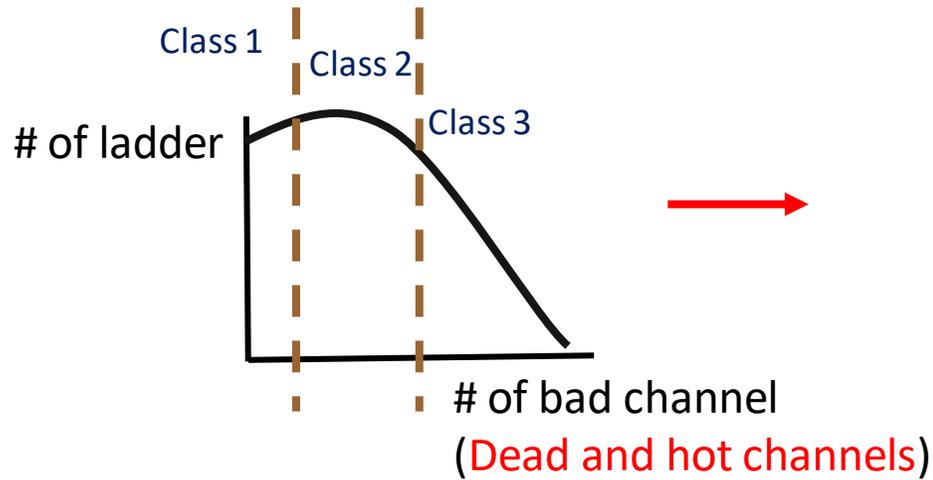
# of channel

Less than  $3\sigma$   
"Noise channel"



# Classification for ladders

## STEP 2. Classify ladders with number of bad channels



Using 13 ladders (26 half ladders)

### Bad channels for Entry:

PBL-L007N: 2      PBL-L015S: 3  
 PBL-L008N: 1      PBL-L015N: 1  
 PB1-L008S: 2      PBL-L016N: 3  
 PB1-L010S: 1      PBL-L017N: 1  
 PBL-L011N: 1      PBL-L018N: 1  
 PBL-L013N: 1

Total bad channels: 17

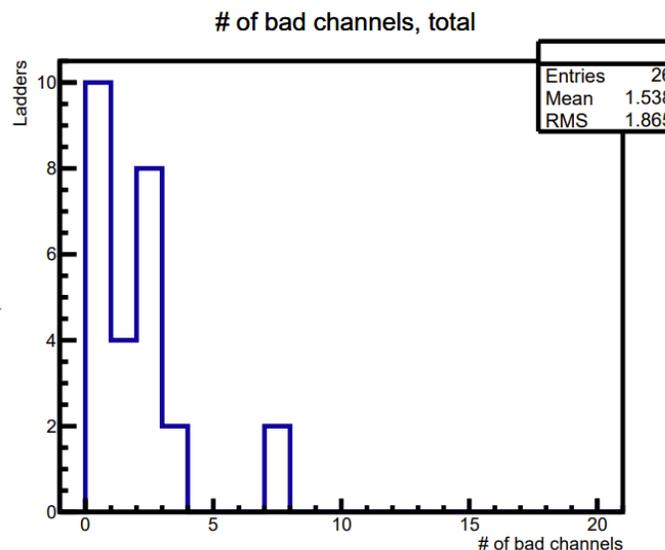
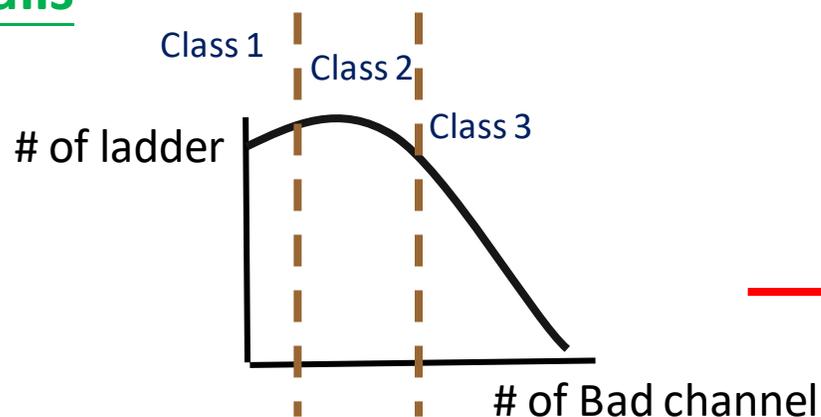
### Bad channels for Noise:

PB1-L006S: 2      PB1-L015S: 4  
 PB1-L007S: 1      PB1-L016S: 1  
 PB1-L008S: 6      PB1-L016N: 1  
 PB1-L008N: 2      PB1-L017N: 1  
 PB1-L010S: 2      PB1-L018N: 2  
 PB1-L011N: 1      PB1-L018S: 2  
 PB1-L014S: 2  
 PB1-L015N: 2

Total bad channels: 29

# Classification for ladders

## STEP 3. Plot the distribution with either dead, hot or noise channels, and Store the details



### Total bad channels:

PB1-L006S: 2    PB1-L015S: 7  
PBL-L007N: 2    PB1-L016S: 1  
PB1-L007S: 1    PB1-L016N: 3  
PB1-L008S: 7    PB1-L017N: 2  
PB1-L008N: 2    PB1-L018N: 2  
PB1-L010S: 2    PB1-L018S: 2  
PB1-L011N: 1  
PBL-L013N: 1  
PB1-L014S: 2  
PB1-L015N: 3

Total bad channels:  
 $17 + 29 - 6$  (overlap)  
 $= 40$

### Pre-classification for each half ladder:

- Class 1 (with zero bad channel)

PB1-L005N, PB1-L005S, PB1-L006N, PB1-L009N, PB1-L009S,  
PB1-L010N, PB1-L011S, PB1-L013S, PB1-L014N, PB1-L017S

- Class 2 (1% bad channels)

PB1-L006S, PBL-L007N, PB1-L007S, PB1-L008S, PB1-L008N,  
PB1-L010S, PB1-L011N, PBL-L013N, PB1-L014S, PB1-L015N,  
PB1-L015S, PB1-L016S, PB1-L016N, PB1-L017N, PB1-L018N,  
PB1-L018S

- Class 3 (> 1% and < 2% bad channels)

No ladders

# Classification for ladders

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## STEP 4. Final classification for ladders

### ■ Classification for each ladder:

- **Class 1 (with zero bad channel)**

PB1-L005, PB1-L009

- **Class 2 ( 1% bad channels)**

PB1-L006, PBL-L007, PB1-L008, PB1-L010S, PB1-L011,  
PBL-L013, PB1-L014, PB1-L015, PB1-L016, PB1-L017,  
PB1-L018

- **Class 3 (> 1% and < 2% bad channels)**

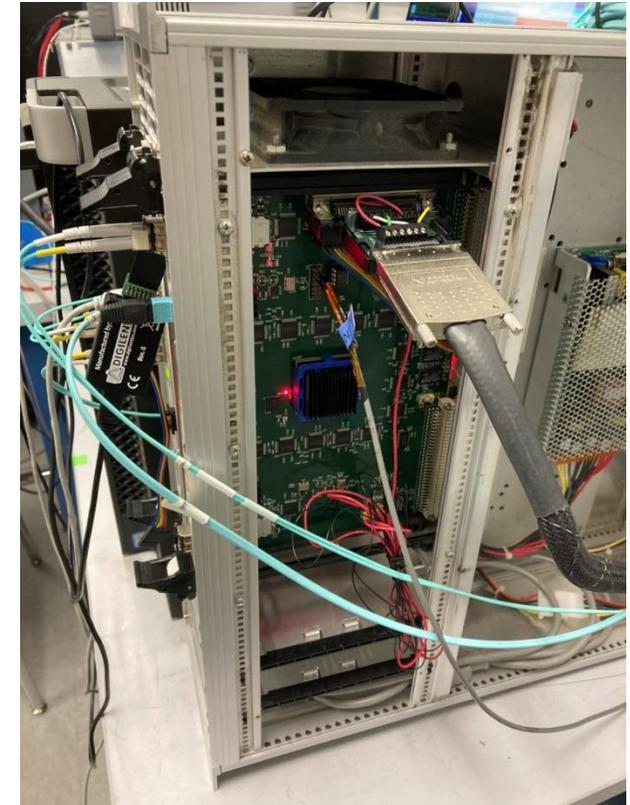
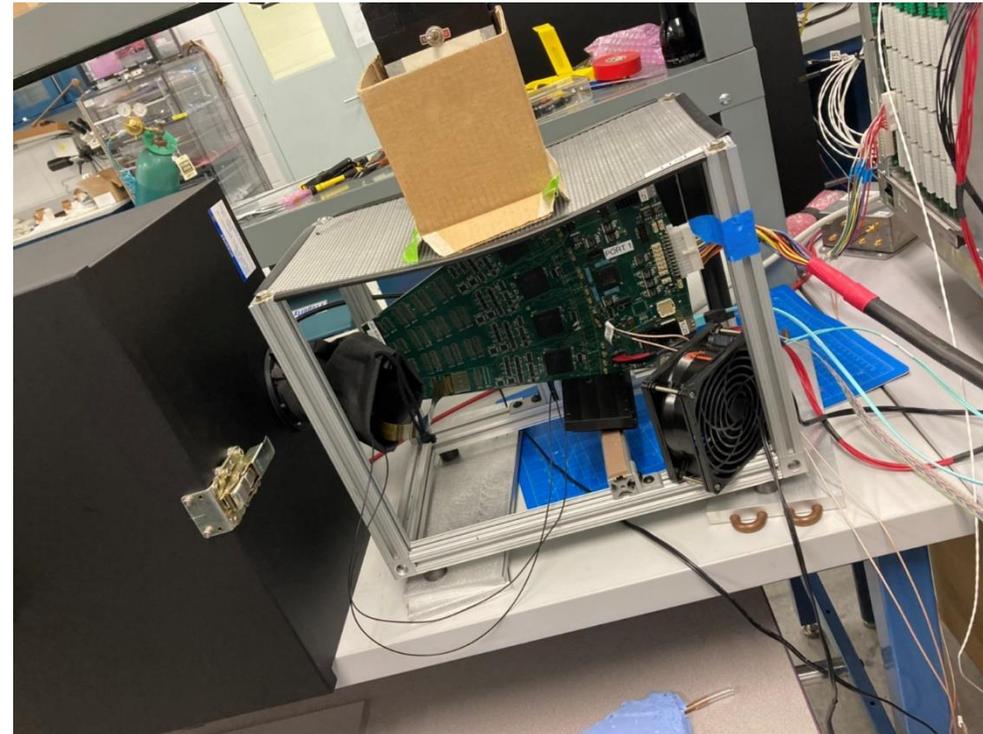
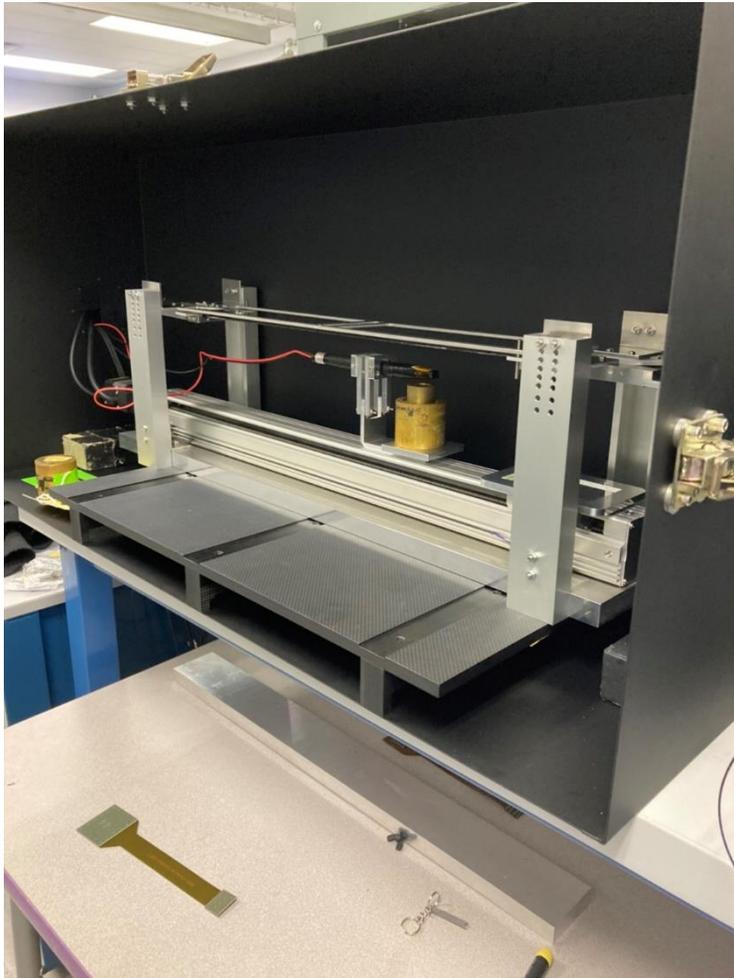
No ladders

### **Conclusion:**

- Most ladders are in the class 2, but less than 1% bad channels.
- To be finalized the criteria of the classification.

# The setup of source test

## ■ Source test fixture:



# The setup of source test

## Trigger preparation:

- Download the FPGA\_code\_1005\_2\_self\_trigger.zip and loaded the "Untitled.mcs" file to "FEM" (the first block on "IMPACT")
- Changed the DAQ program from read\_DAQ\_calib.exe to read\_DAQ\_self.exe

