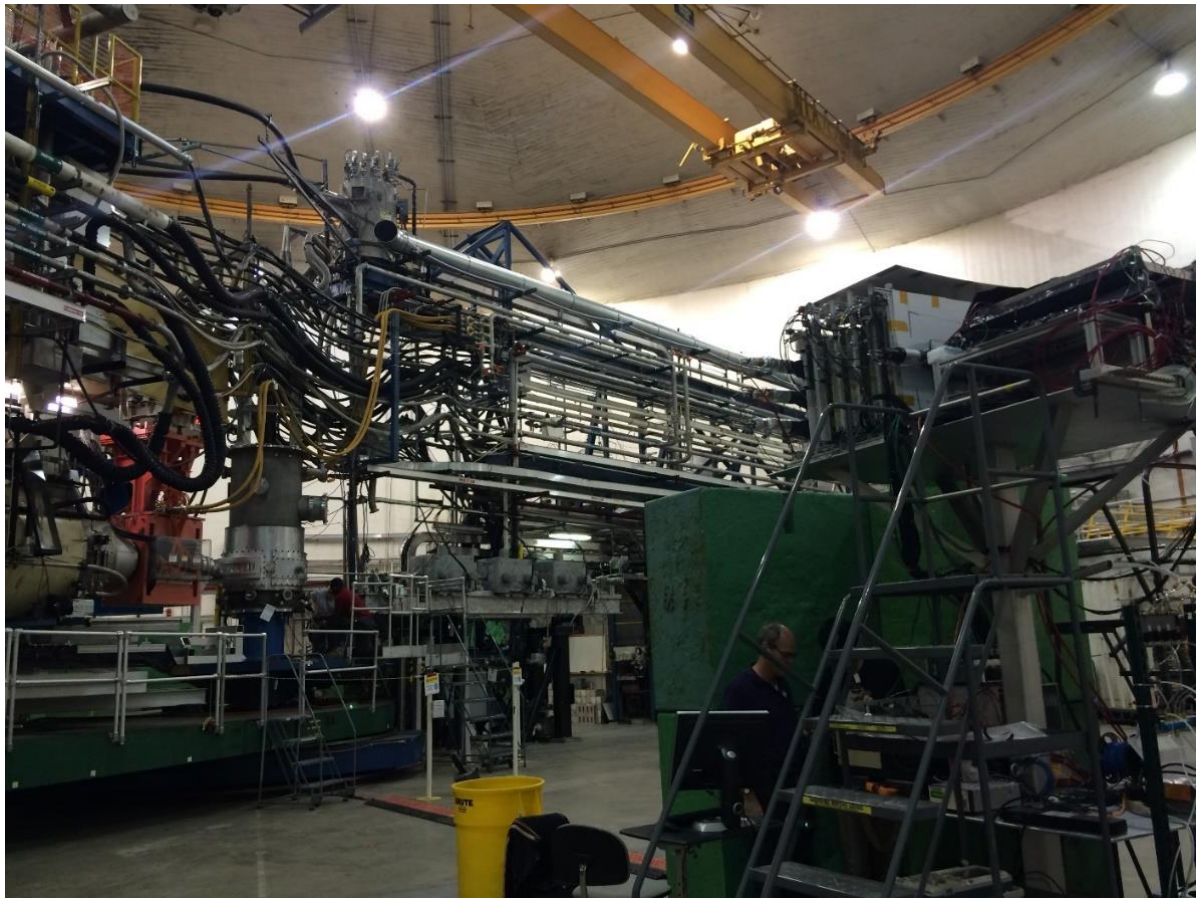
# Beam test status update

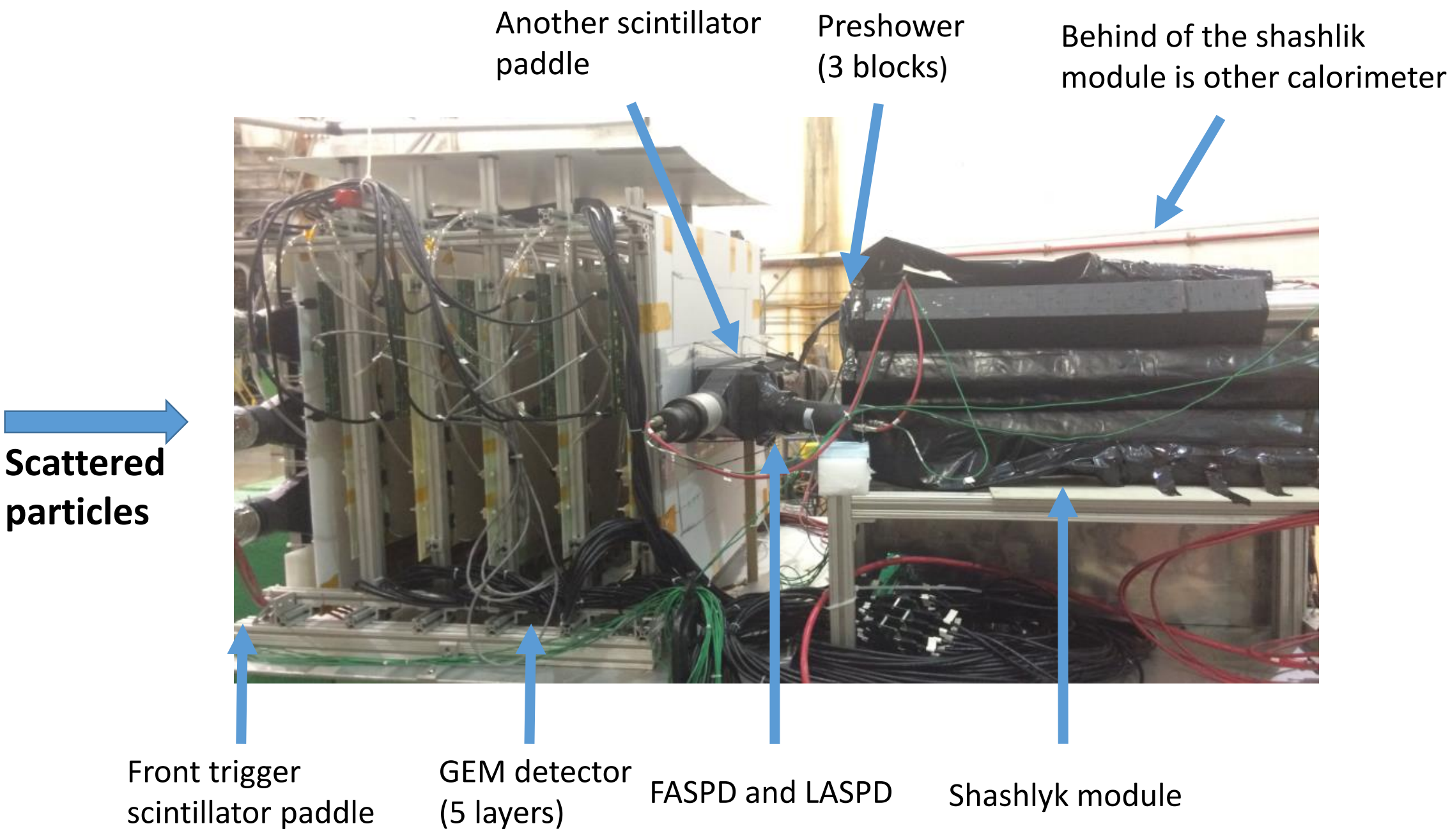
10/27/2016

Ye Tian, Vincent Sulkosky

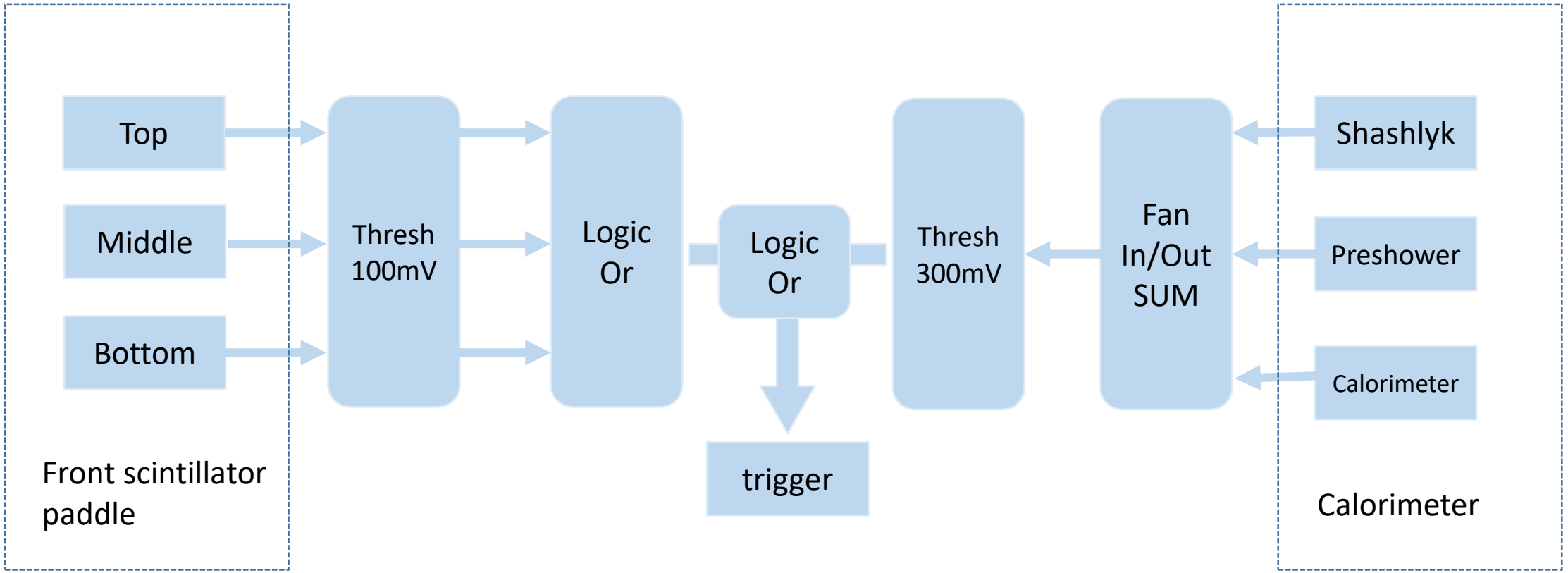
# The overall test setup

The detectors are put at left side of beam, and the angle related to beam is about 80 degree, 15m away from target.




Another scintillator paddle
Preshower (3 blocks)
Behind of the shashlik module is other calorimeter
Scattered particles
Front trigger scintillator paddle
GEM detector (5 layers)
FASPD and LASPD
Shashlyk module

# Trigger


Top
Middle
Bottom
Front scintillator paddle
Thresh 100mV
Logic Or
Logic Or
trigger
Thresh 300mV
Fan In/Out SUM
Shashlyk
Preshower
Calorimeter
Calorimeter

# Scaler rate

**Cosmic scaler rate**

======== 1151 Scalers ==========

scaler num 1

| Type | Counts | Rate (Hz) | Rate (KHz) |
|---|---|---|---|
| 10 KHz pulser | 101434 | 10000.00 | 10.00 |
| Front Top scint | 47 | 4.63 | 0.00 |
| Front Mid scint | 53 | 5.23 | 0.01 |
| Front Bot scint | 63 | 6.21 | 0.01 |
| OR of Front scint | 147 | 14.49 | 0.01 |
| Calorimeter Trigger | 350 | 34.51 | 0.03 |
| L1A | 0 | 0.00 | 0.00 |
| TDC Common Stop | 0 | 0.00 | 0.00 |
| TI Busy | 0 | 0.00 | 0.00 |
| Trigger | 0 | 0.00 | 0.00 |
| MPD clock | 0 | 0.00 | 0.00 |
| S4 | 9 | 0.89 | 0.00 |
| S5 | 67 | 6.61 | 0.01 |

| | |
|---|---|
| hac_bcm_average | 0.0521651 |
| haBDSPOS.VAL | 6.8488e+06 |
| haBDSPOS | 6.8488e+06 |
| haBDSSELECT | Carbon |

**Scaler rate with beam on**

| Type | Counts | Rate (Hz) | Rate (KHz) |
|---|---|---|---|
| 10 KHz pulser | 101881 | 10000.00 | 10.00 |
| Front Top scint | 4094456 | 401886.12 | 401.89 |
| Front Mid scint | 10800795 | 1060138.30 | 1060.14 |
| Front Bot scint | 8701107 | 854046.09 | 854.05 |
| OR of Front scint | 22204054 | 2179410.69 | 2179.41 |
| Calorimeter Trigger | 1162274 | 114081.53 | 114.08 |
| L1A | 269 | 26.40 | 0.03 |
| TDC Common Stop | 269 | 26.40 | 0.03 |
| TI Busy | 269 | 26.40 | 0.03 |
| Trigger | 538145 | 52820.94 | 52.82 |
| MPD clock | 579469 | 56877.04 | 56.88 |
| S4 | 101967 | 10008.44 | 10.01 |
| S5 | 2063590 | 202549.05 | 202.55 |

| | |
|---|---|
| hac_bcm_average | 67.6139 |
| haBDSPOS.VAL | 2.57999e+07 |
| haBDSPOS | 2.57999e+07 |
| haBDSSELECT | Loop 2 |

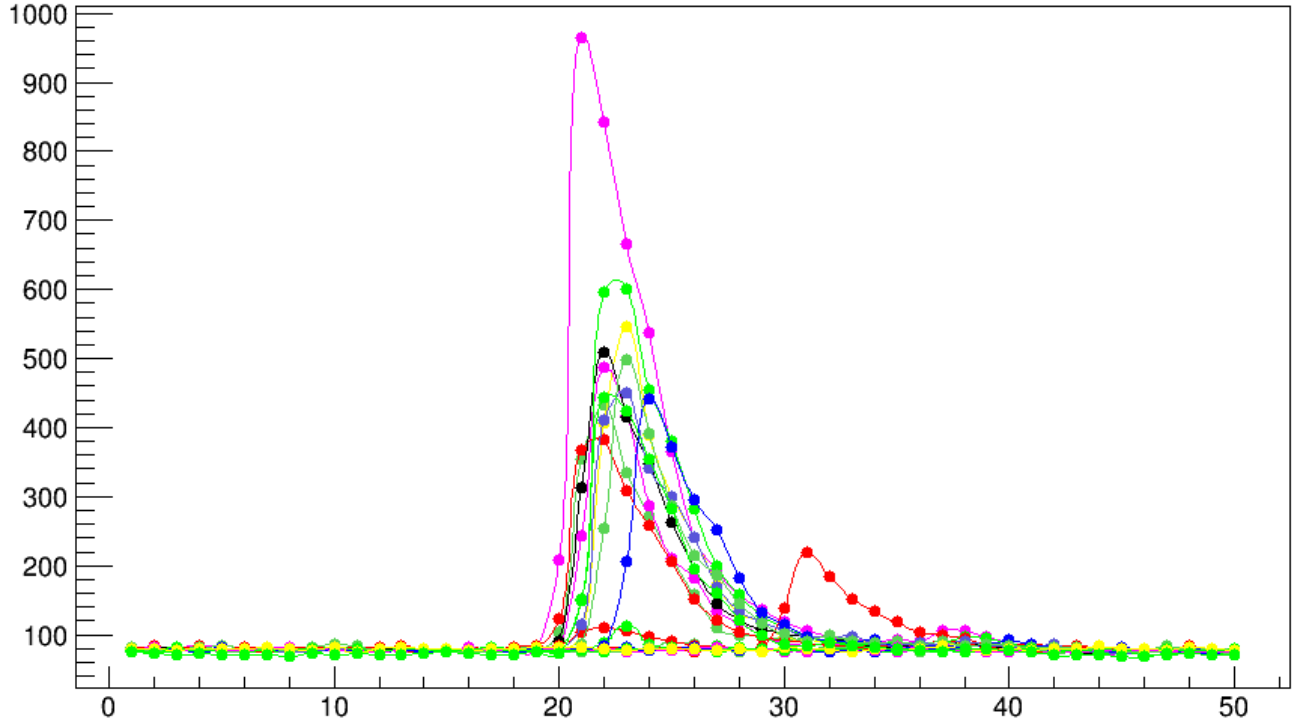
# Electronics

- FADC: 2 boards, 2* 16 ch, all calorimeter blocks and preshowers are connected, prepare another one to get all scintillator signal
- TDC: 32 channel, record all scintillator time information except calorimeter
- Scaler: 16 ch, observe signal rate

- Readout is restricted by storing rate to disk, prescale which could limit trigger rate is about 100K.

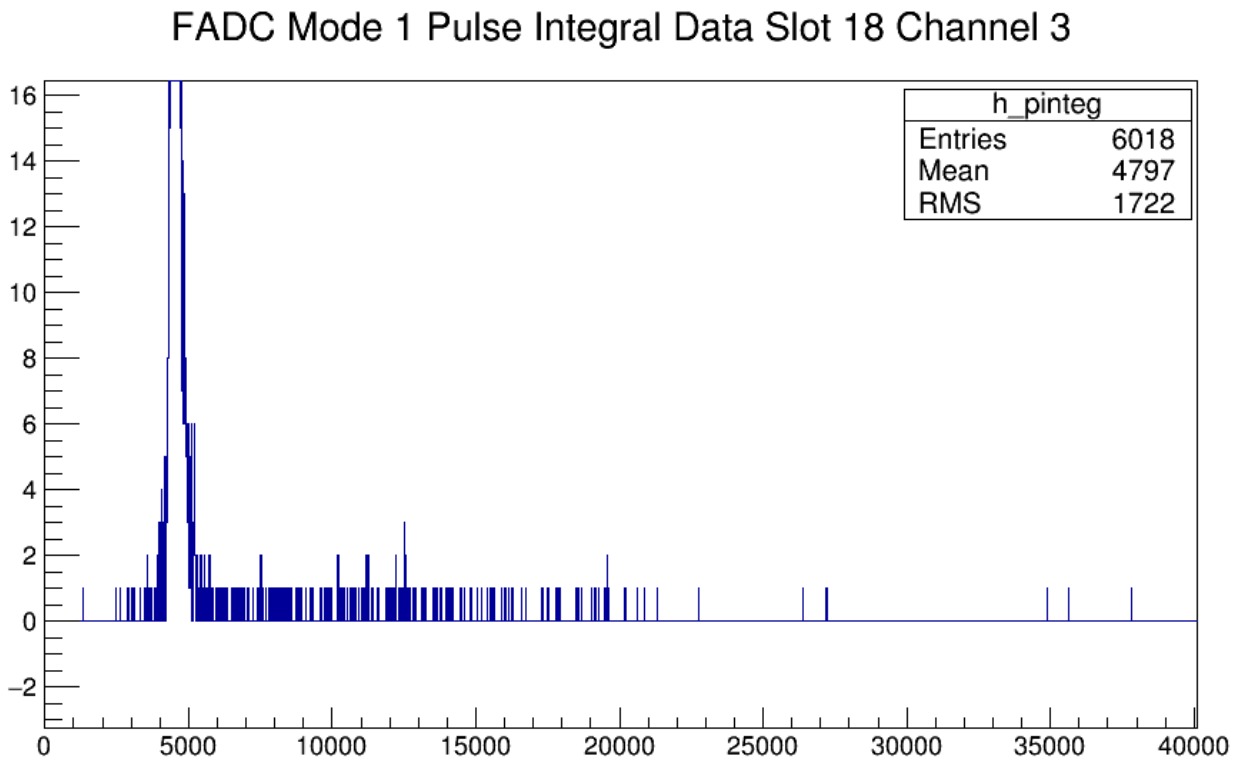
# FADC FADC readout

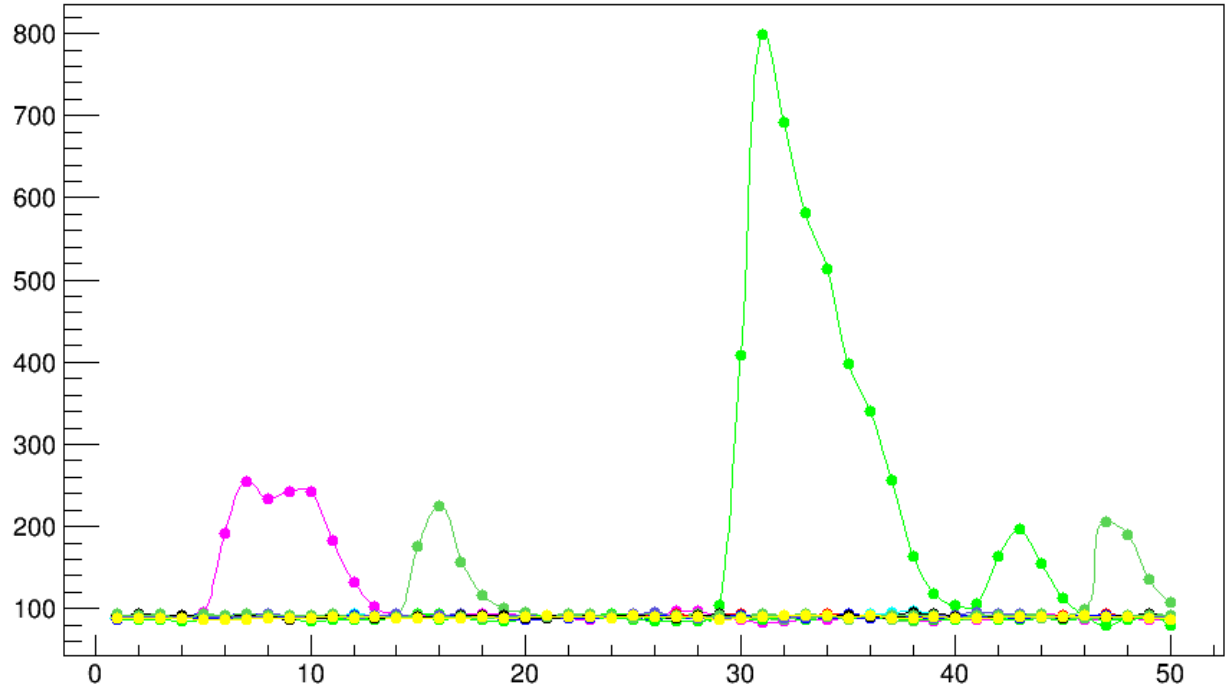
- Record 50 points for each event, time interval between two points is 4ns
- Readout by adapted HallA analyzer



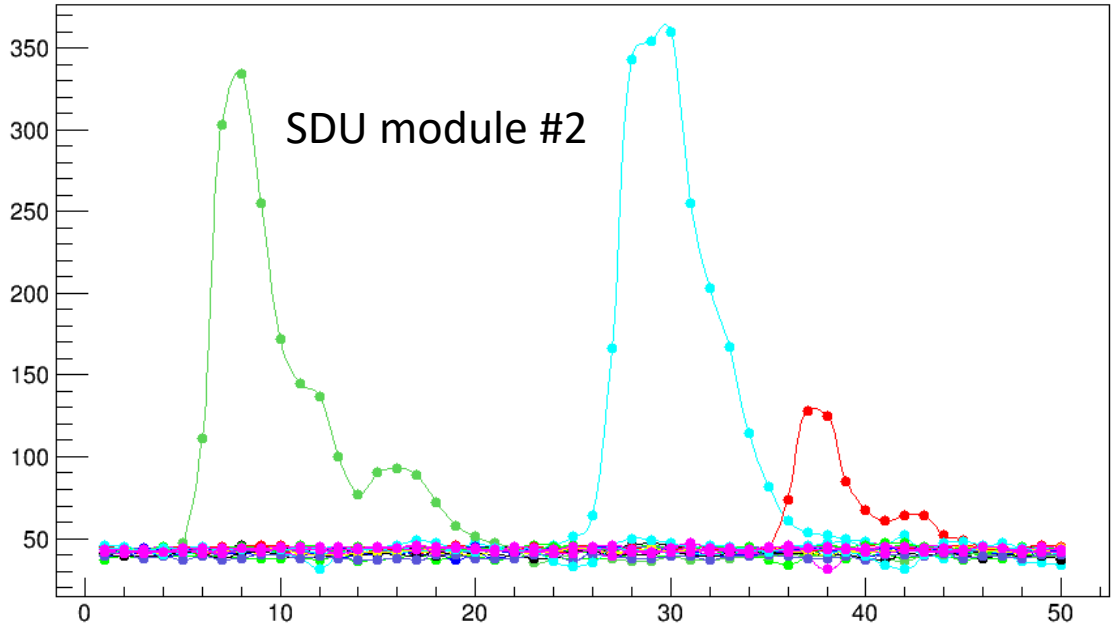
# THU module

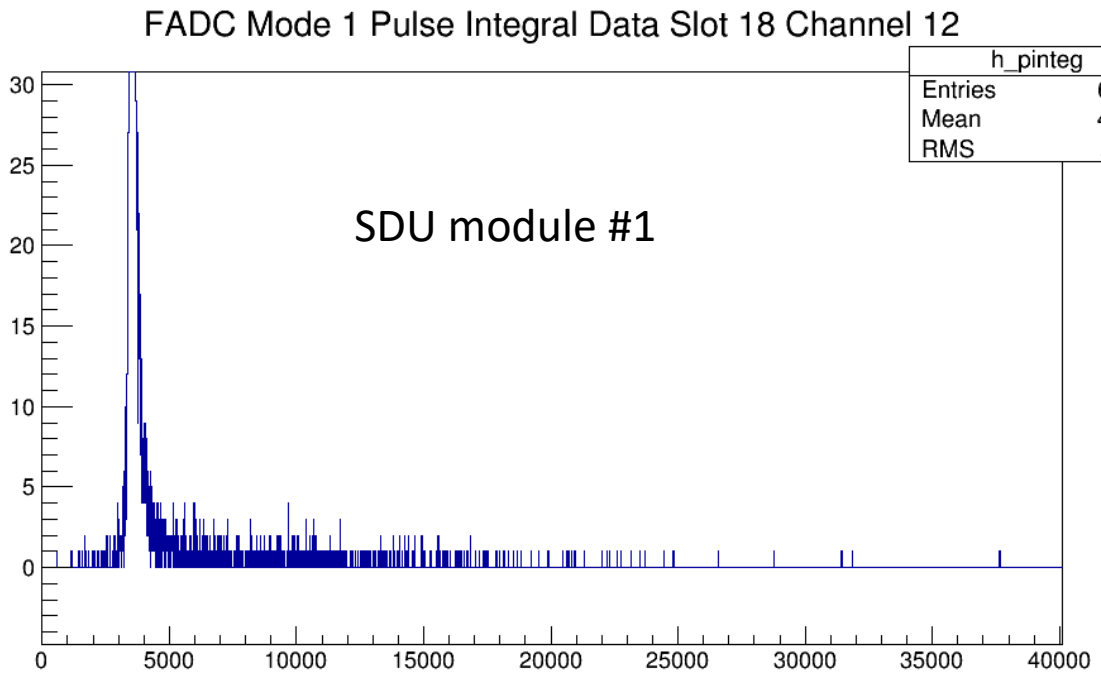
| HV | Rate(Hz)(cosmic) |
|---|---|
| 2000 | 34.5 |
| 2200 | 596 |
| 2550 | 3625 |

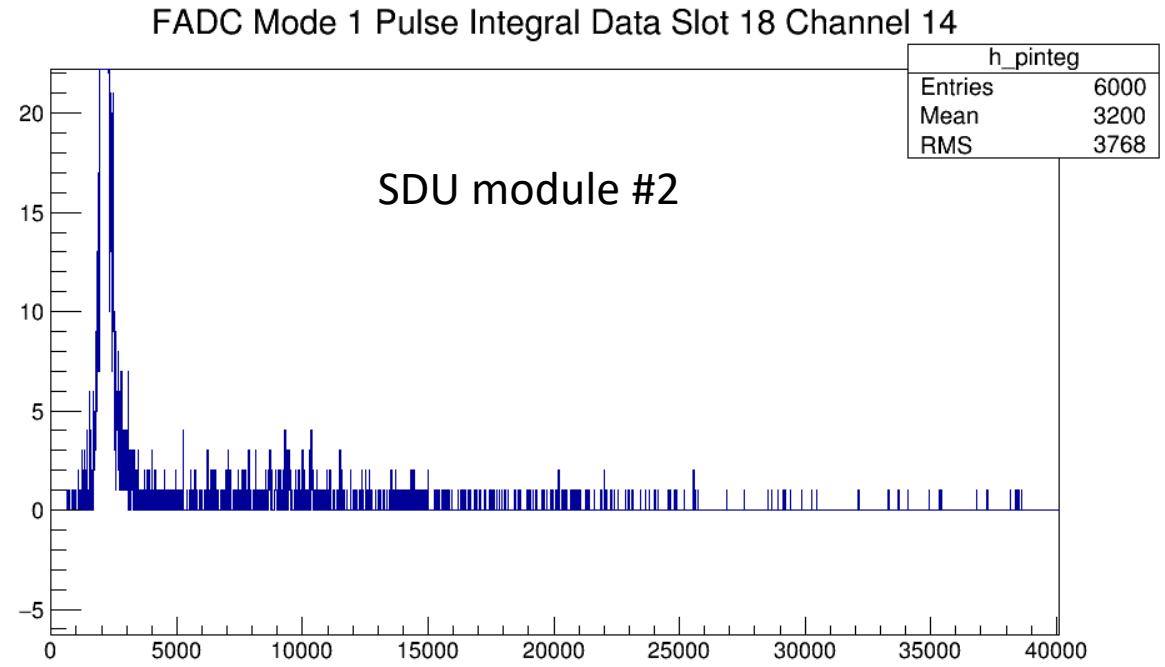


# SDU module


SDU module #2
350
300
250
200
150
100
50
0
10
20
30
40
50

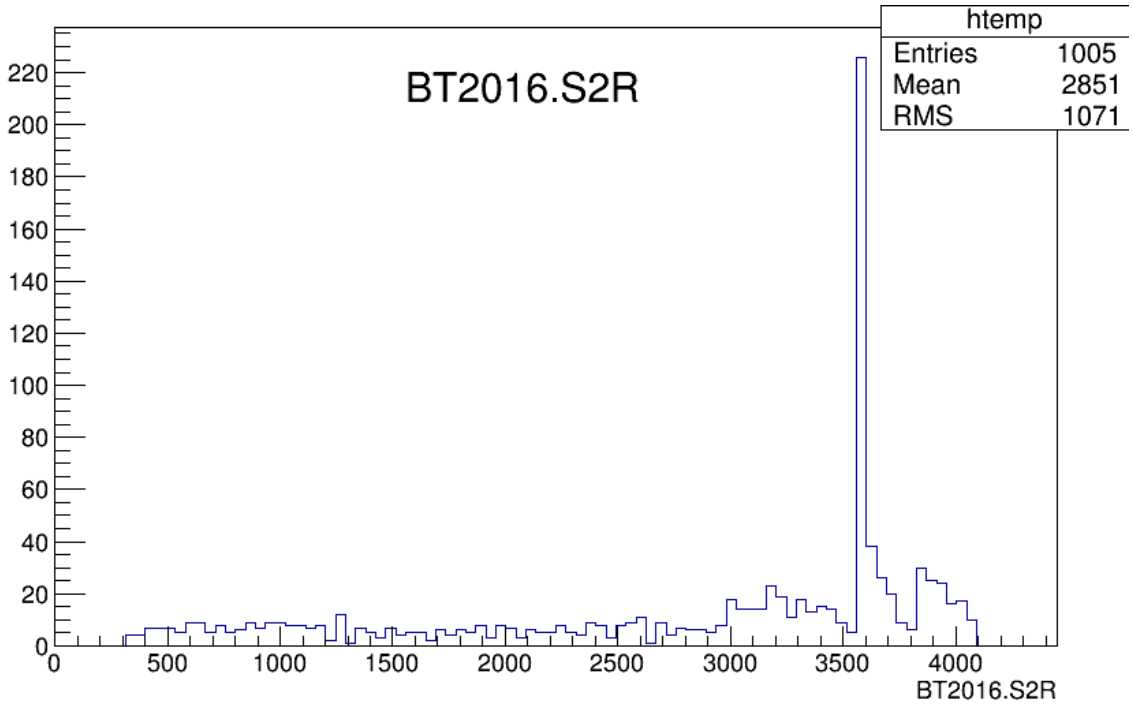

FADC Mode 1 Pulse Integral Data Slot 18 Channel 12
h_pinteg
Entries 6018
Mean 4149
RMS 2361
SDU module #1
30
25
20
15
10
5
0
0
5000
10000
15000
20000
25000
30000
35000
40000


FADC Mode 1 Pulse Integral Data Slot 18 Channel 14
h_pinteg
Entries 6000
Mean 3200
RMS 3768
SDU module #2
20
15
10
5
0
−5
0
5000
10000
15000
20000
25000
30000
35000
40000

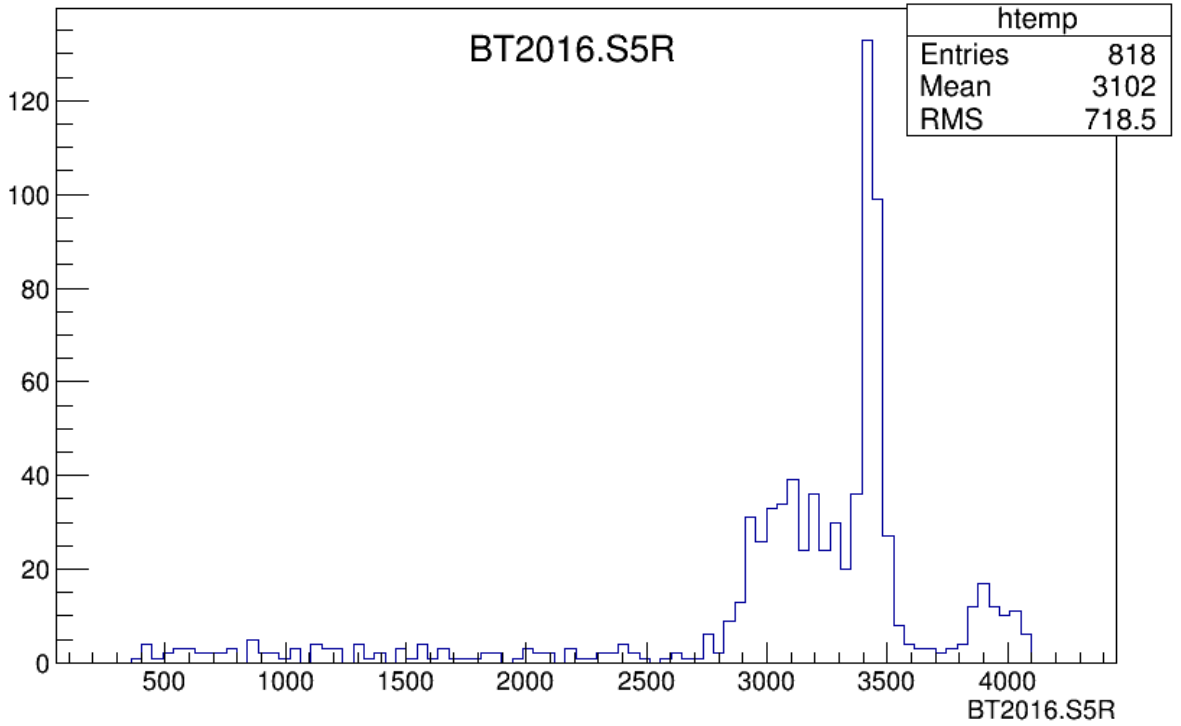
# TDC signal

- Decoder script written by Vince
- Need to check the peak, and separate different trigger

Trigger paddle raw TDC data




LASPD raw TDC data



# The work for next step

- Put the three shashlik module together to get cluster
- Tune the high voltage of preshower and shashlyk
- Make sure the time information reliable
- Combine the data of all detectors together