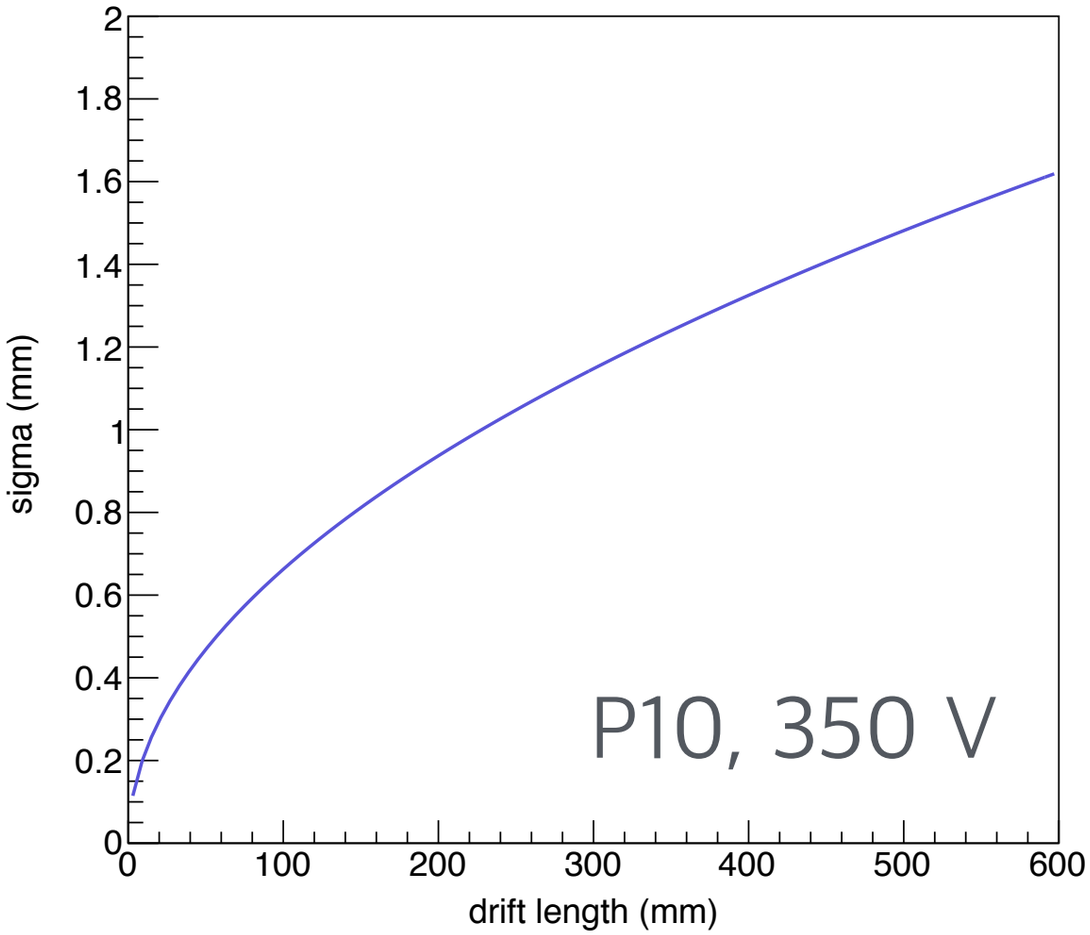
LAMPS-TPC Simulation

이정우

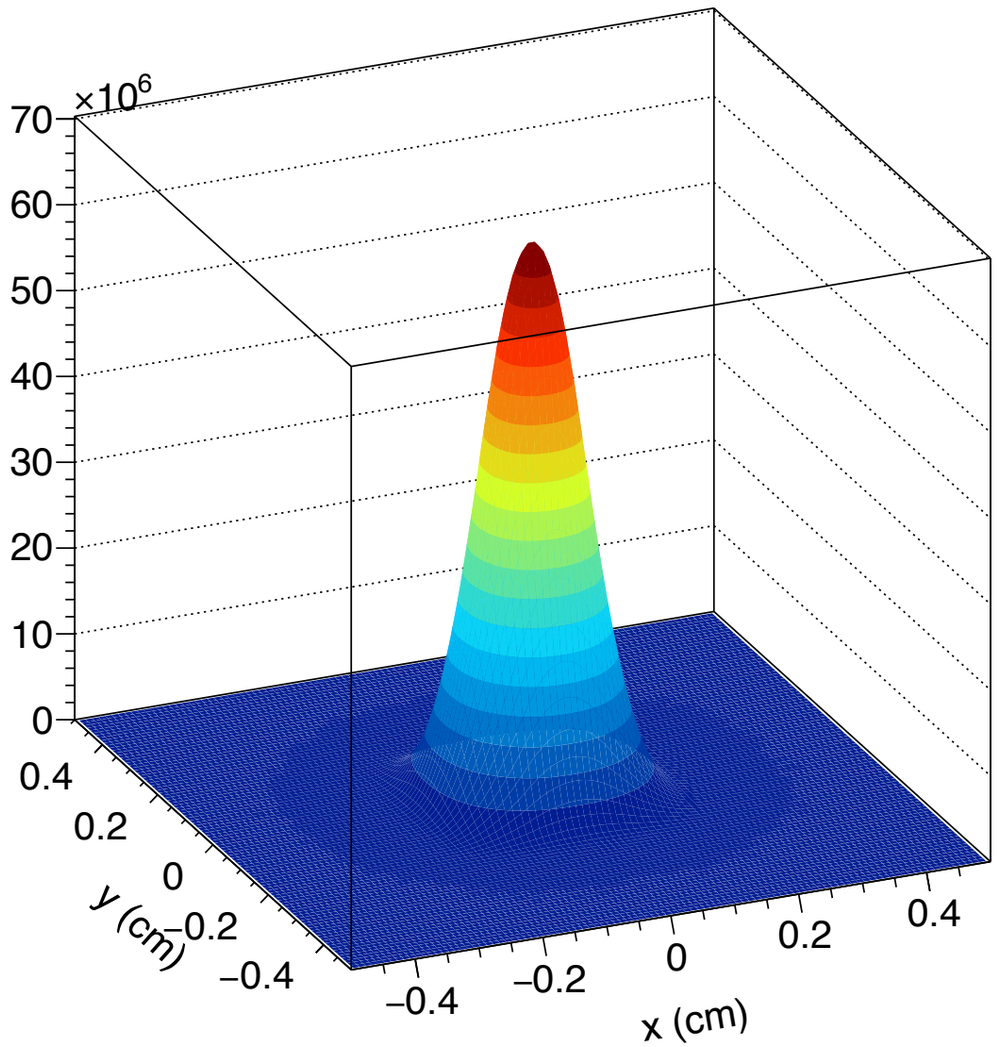
Group Meeting 2015.07.24

Diffusion of Current Simulation

Drift Diffusion

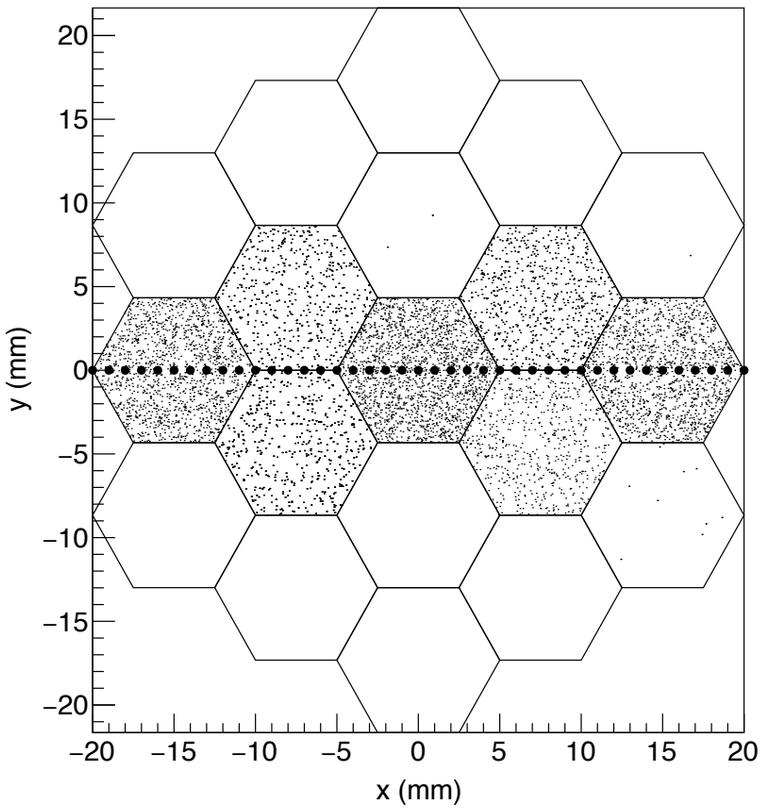


Triple-GEM Diffusion

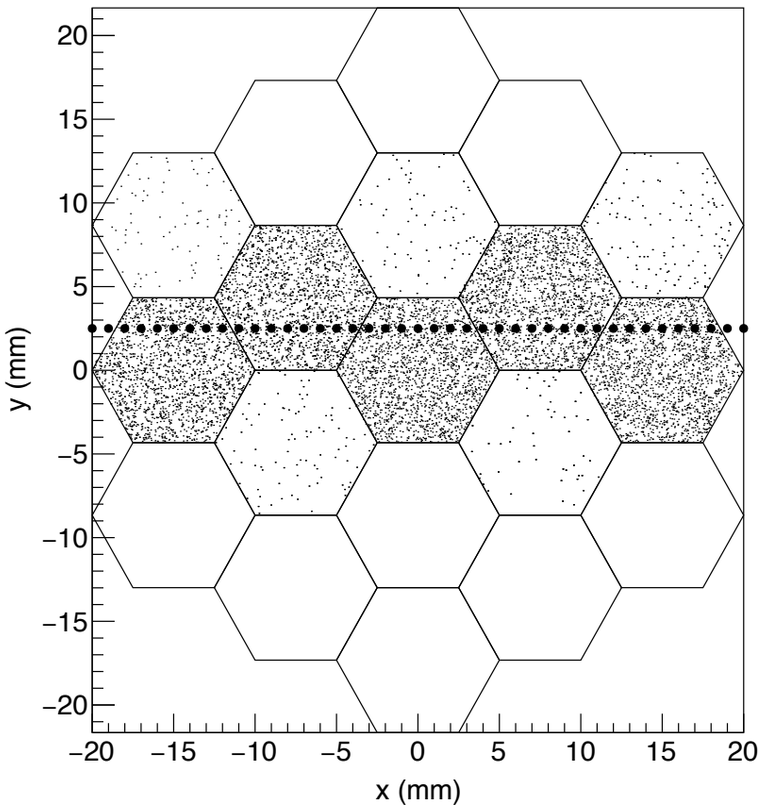


Diffusion Test

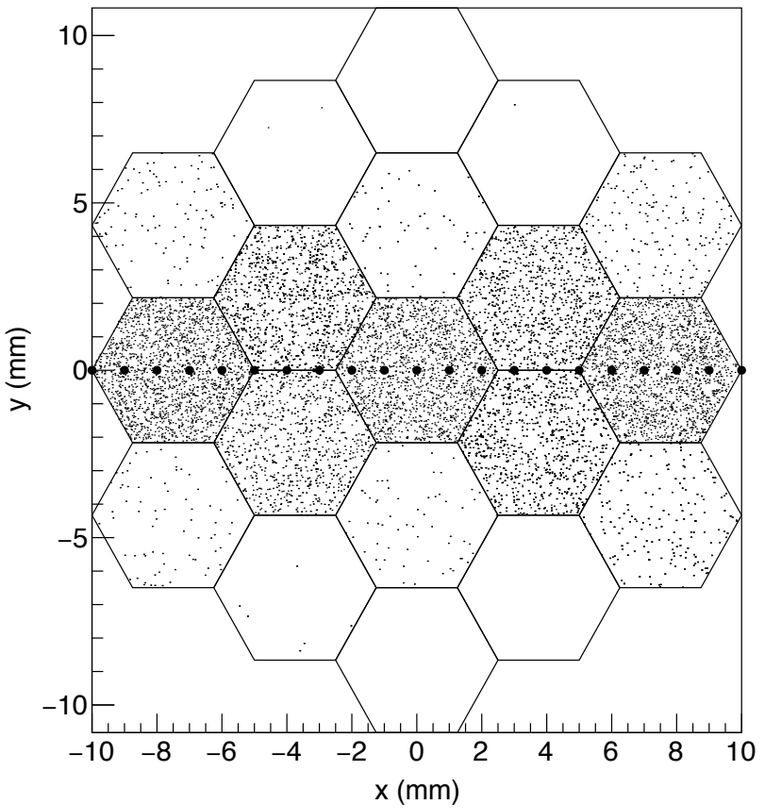
5 mm example 1



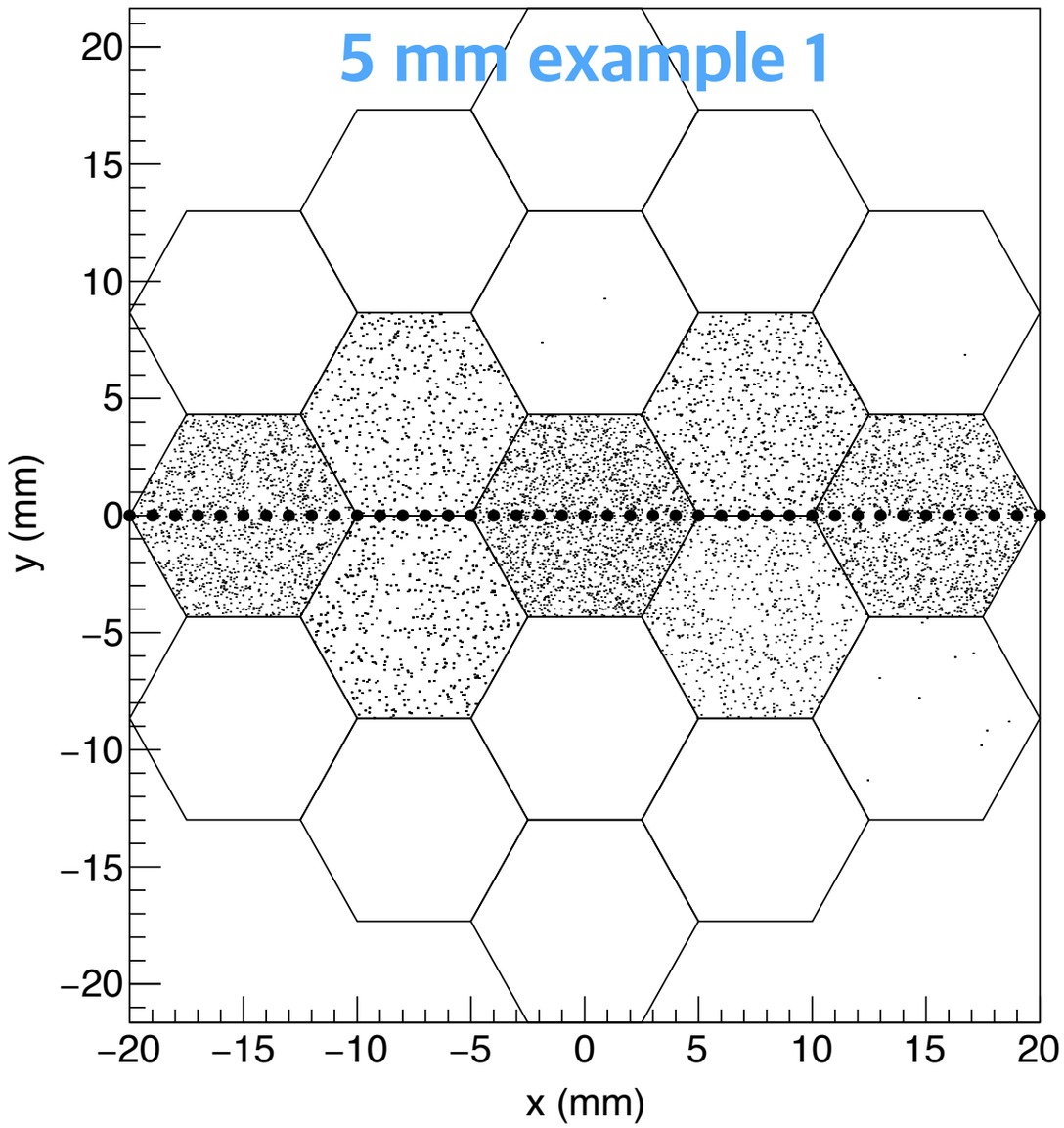
5 mm example 2

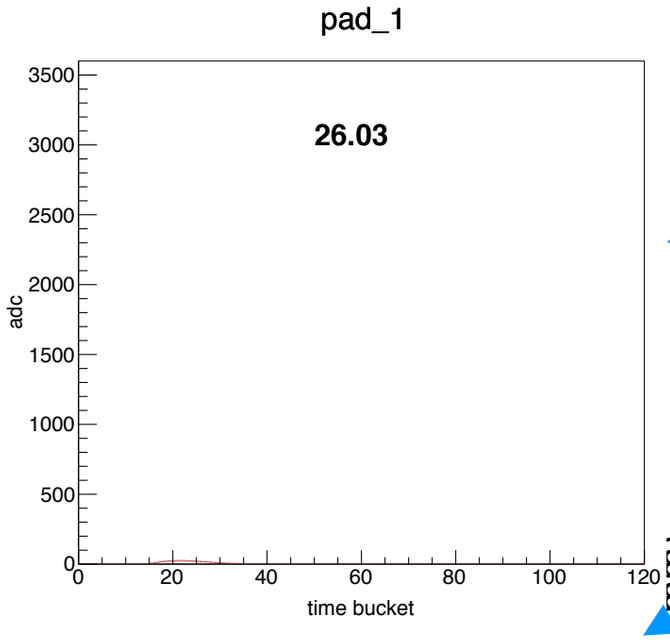


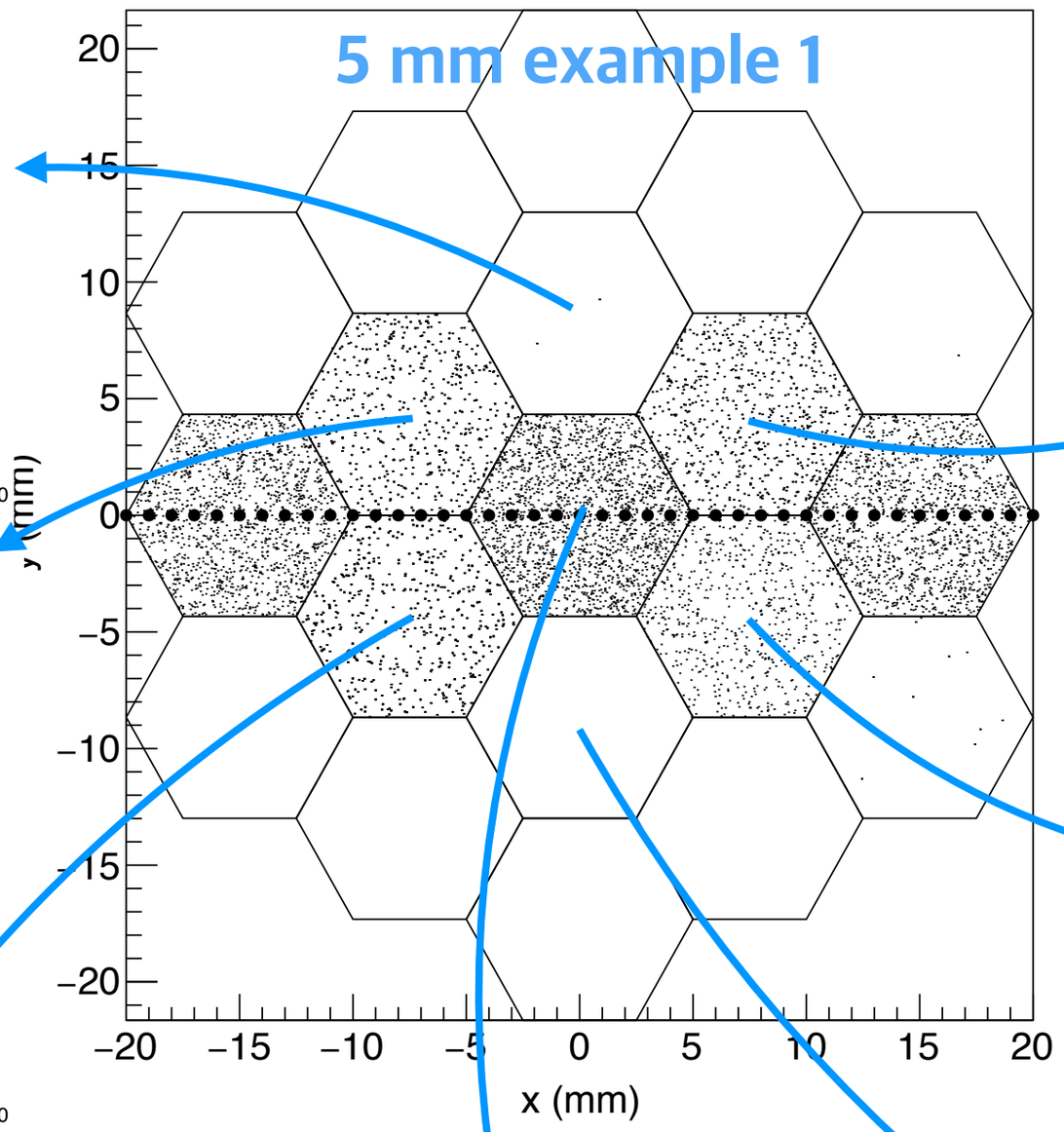
2.5 mm example

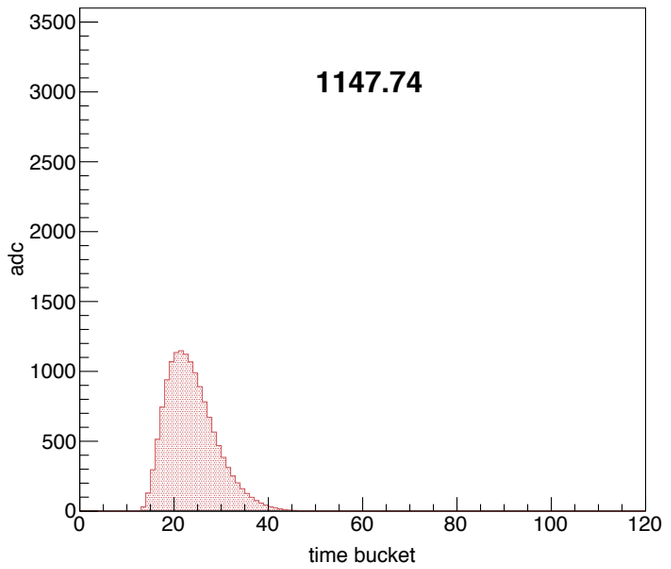


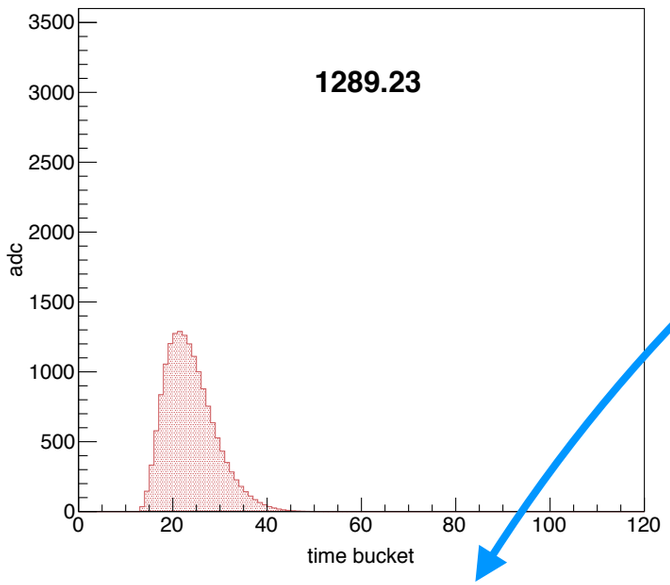
- MC point is given with 1 mm step each producing 30 electrons (drifting 600 mm).
- Signal is filled after diffusion and GEM gain to the pad plane.
- Charge of pads are scaled not to go over 3600 ADC value.
- ADC value should be higher than at least 5 to make hit.

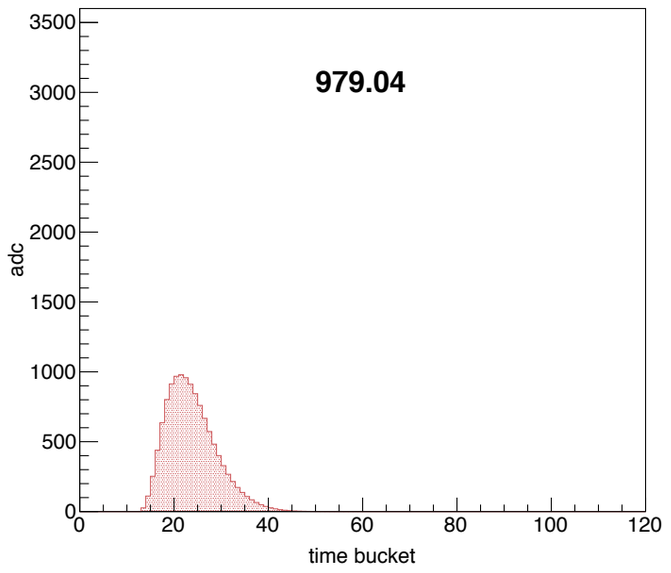

5 mm example 1
y (mm)
x (mm)
20
15
10
5
0
−5
−10
−15
−20
−20
−15
−10
−5
0
5
10
15
20

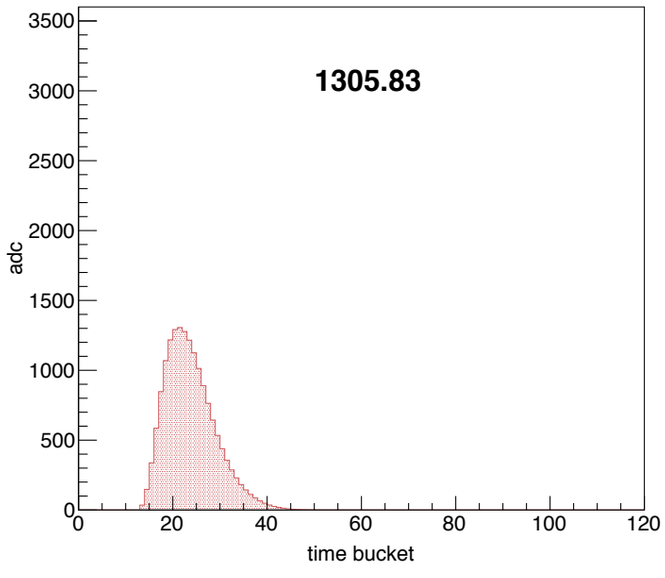

pad_1
26.03
adc
time bucket

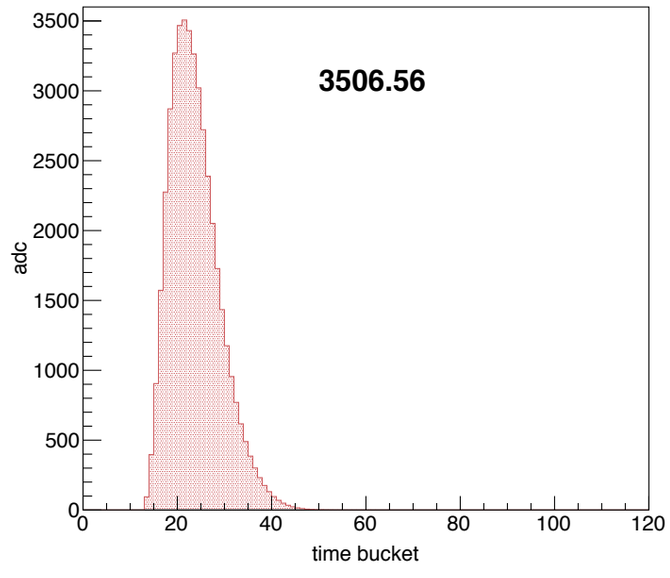

5 mm example 1
y (mm)
x (mm)

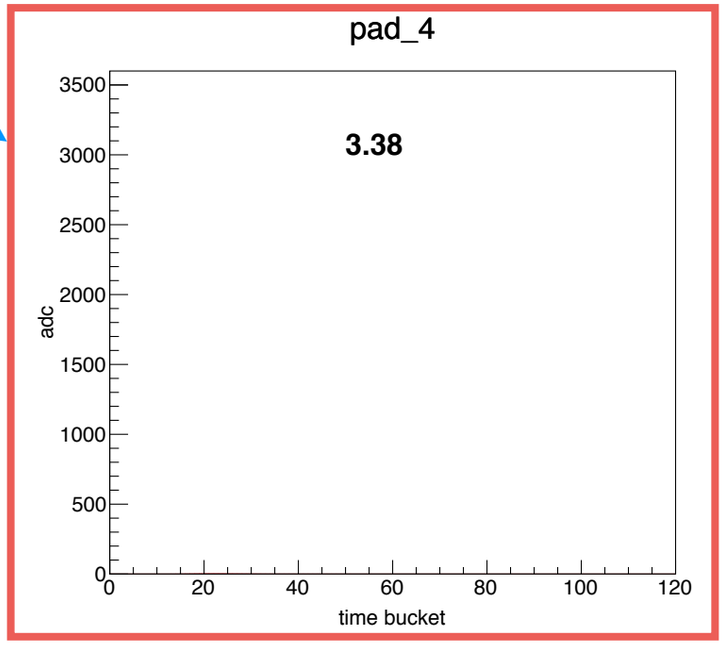

pad_6
1147.74
adc
time bucket

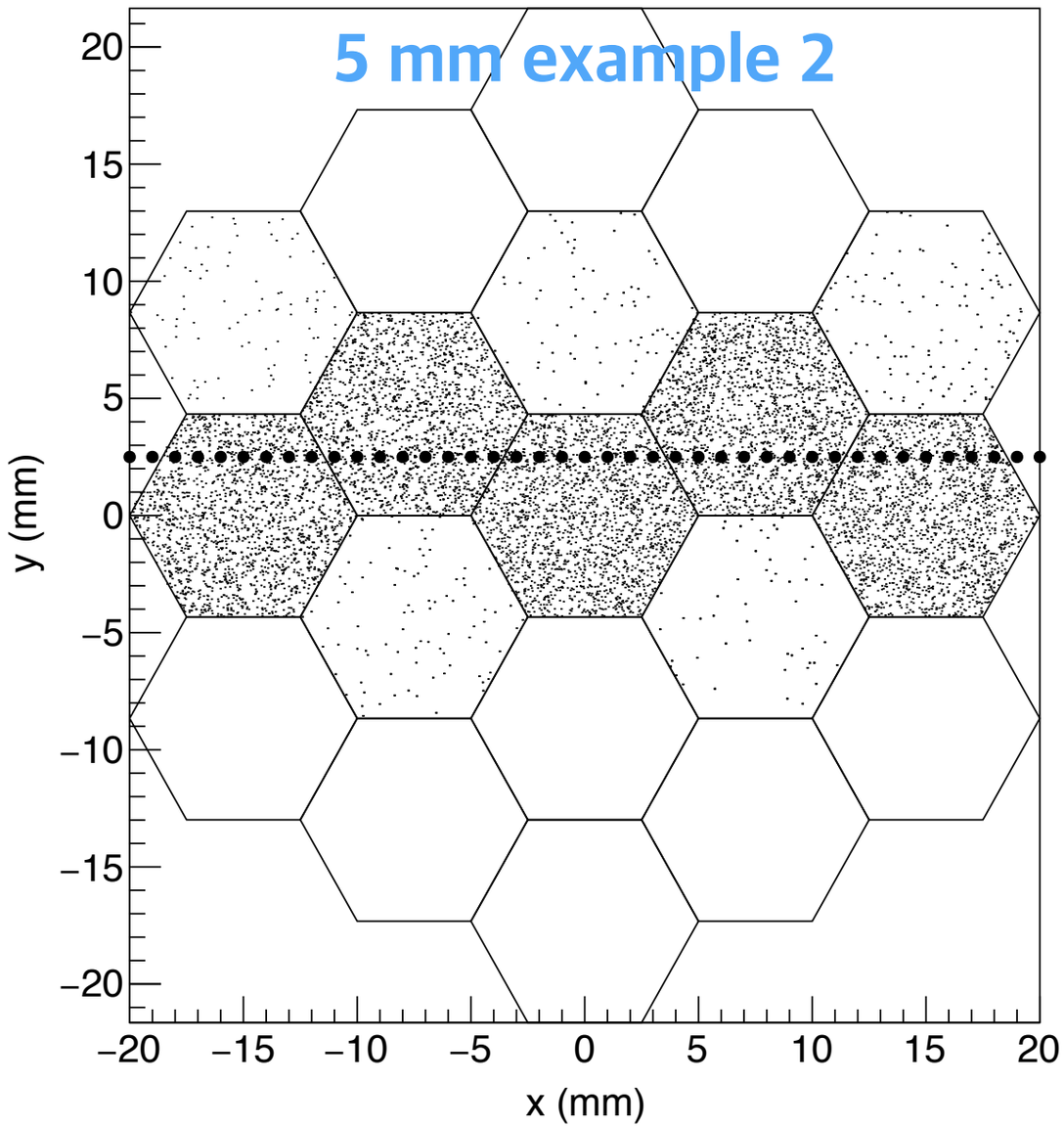

pad_2
1289.23
adc
time bucket


pad_5
979.04
adc
time bucket

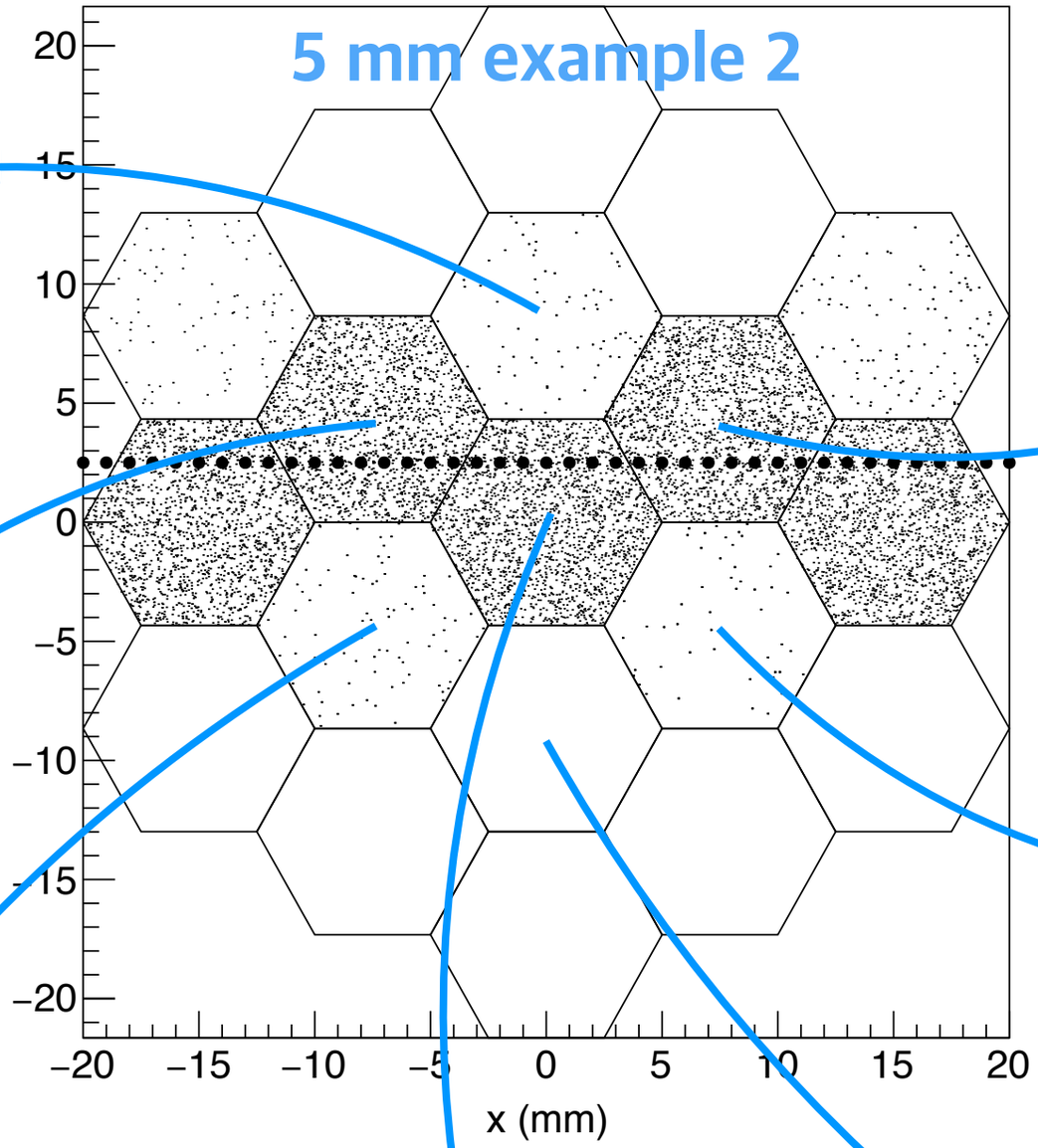

pad_3
1305.83
adc
time bucket


pad_0
3506.56
adc
time bucket

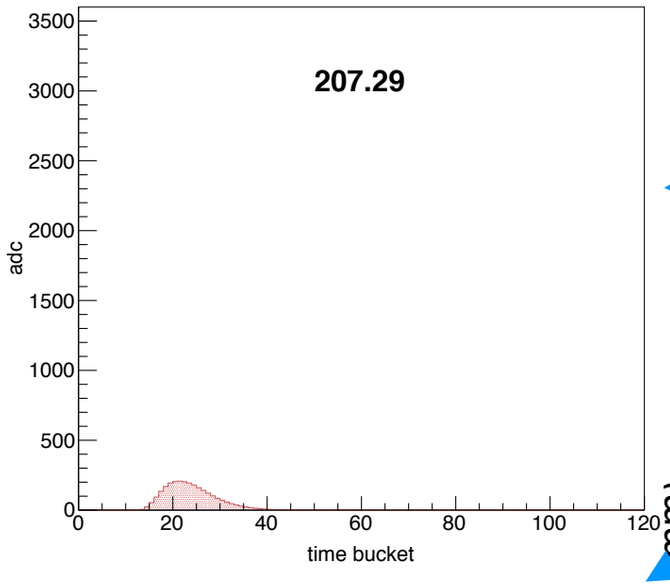

pad_4
3.38
adc
time bucket


5 mm example 2
y (mm)
x (mm)
20
15
10
5
0
−5
−10
−15
−20
−20
−15
−10
−5
0
5
10
15
20

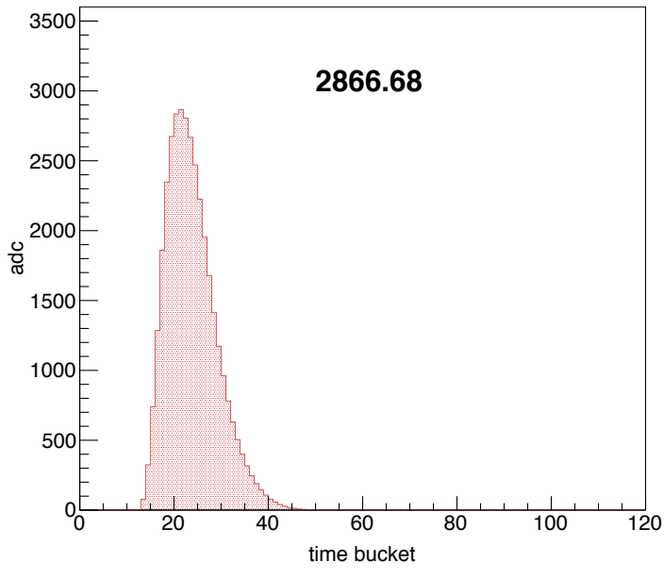
5 mm example 2



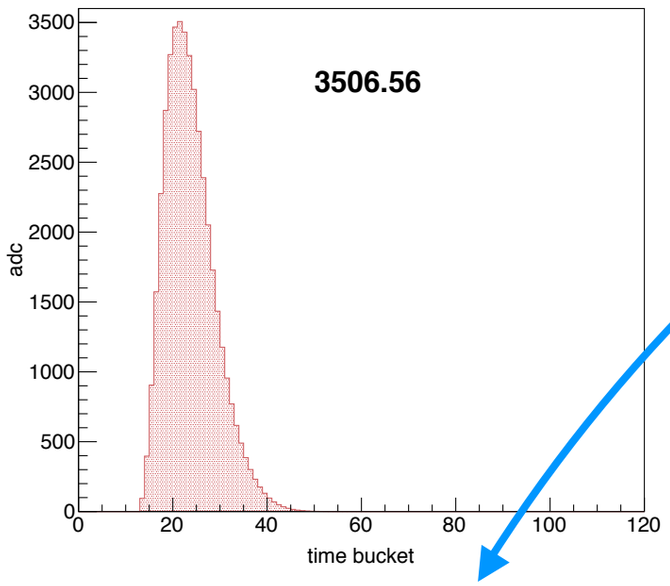
pad_1



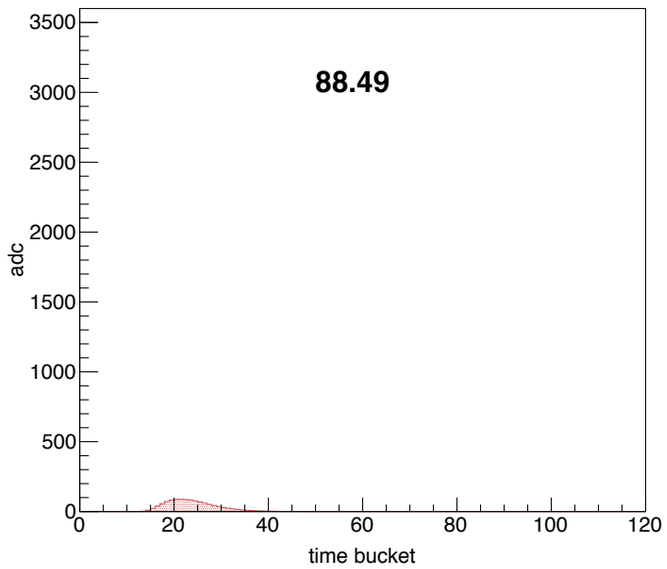
pad_6



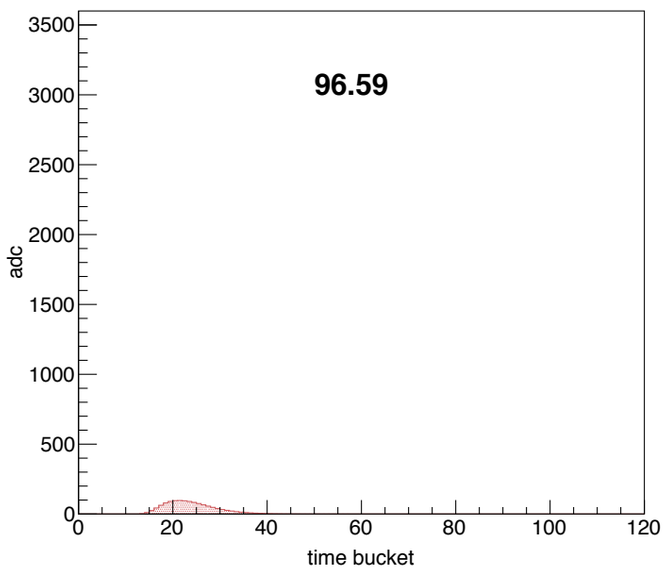
pad_2



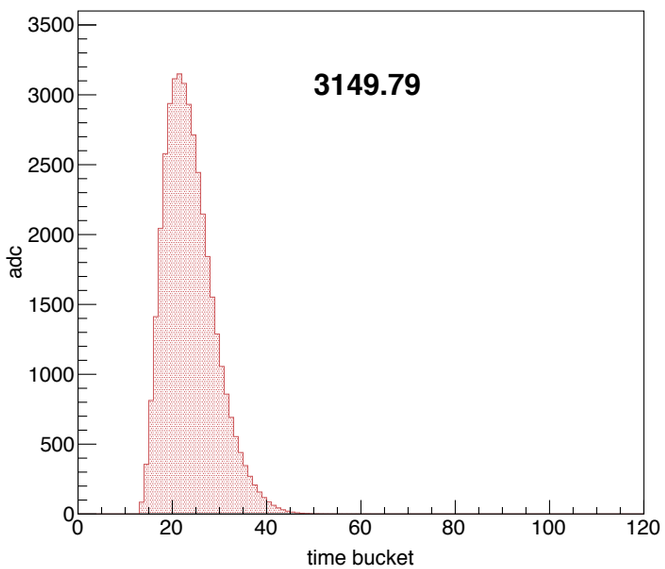
pad_5



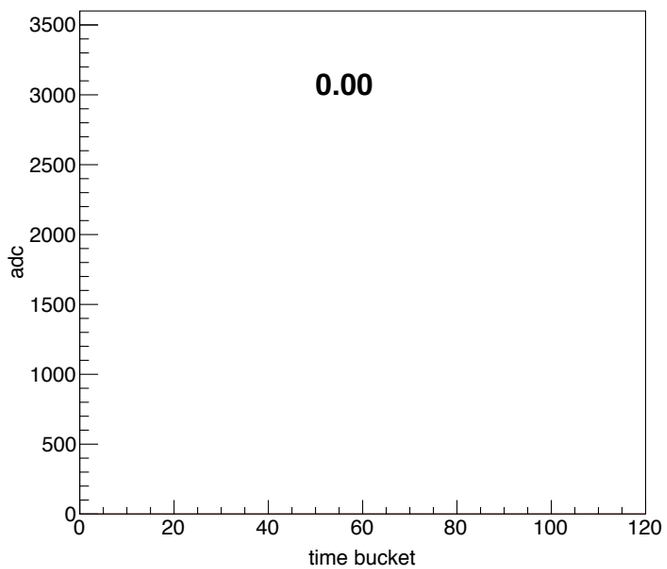
pad_3

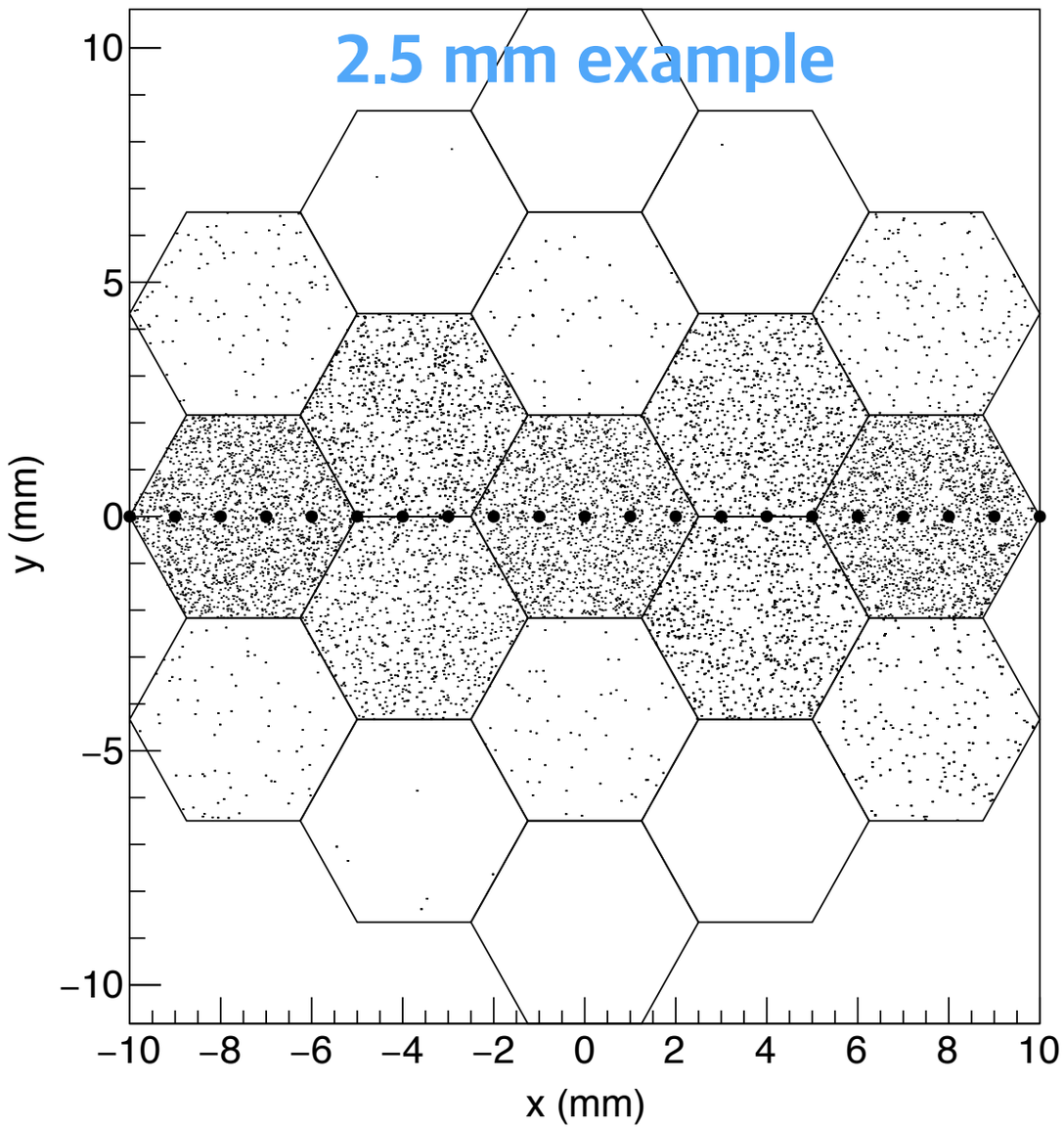


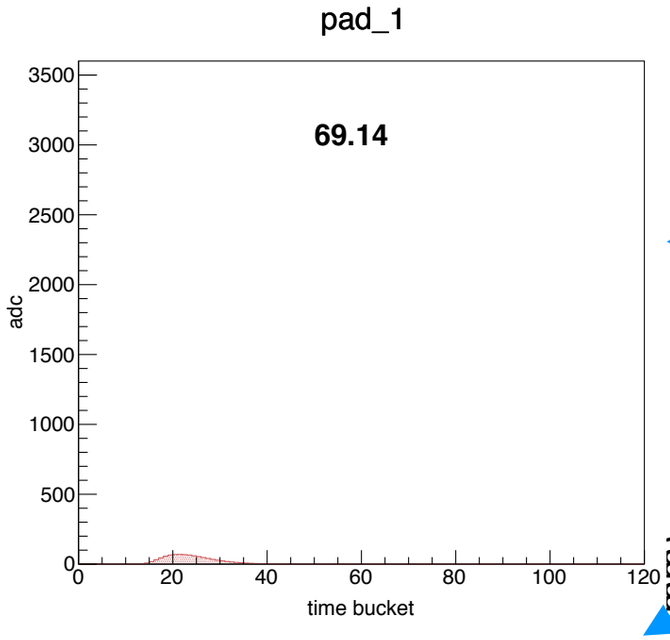
pad_0

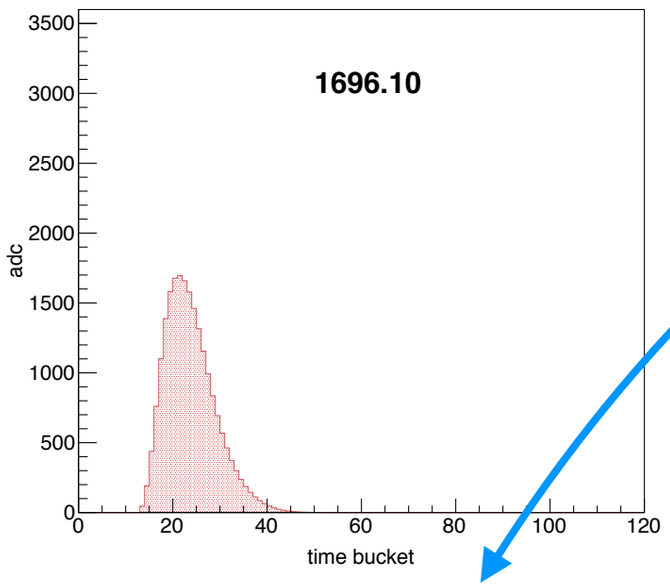


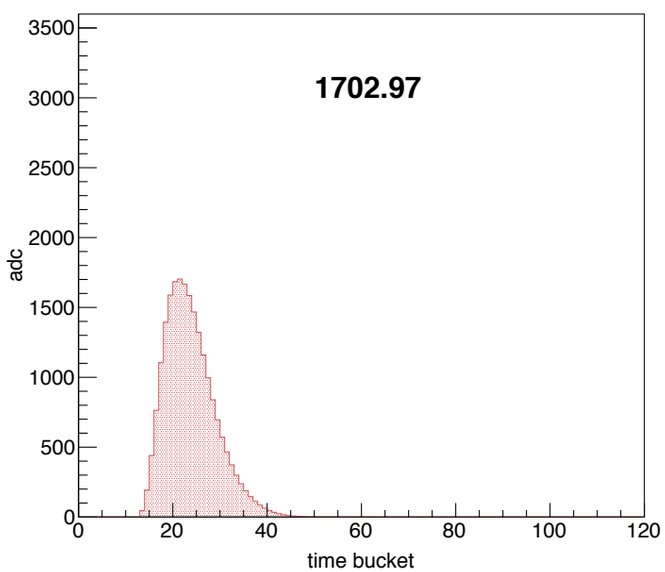
pad_4

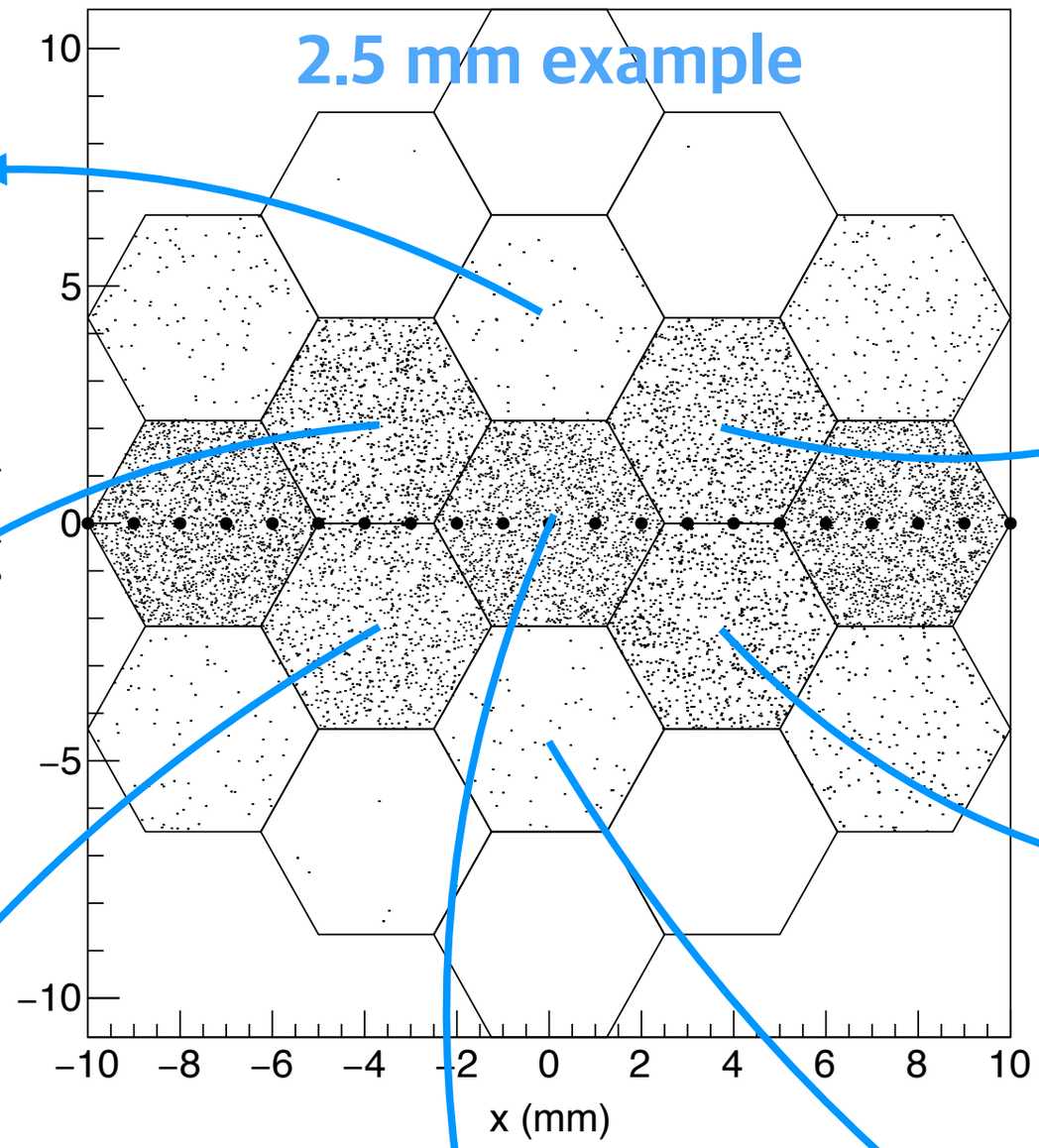


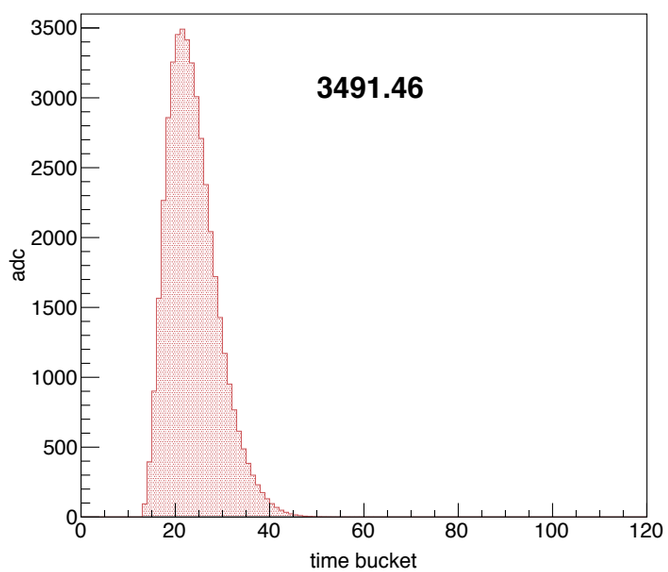

2.5 mm example
10
5
0
−5
−10
y (mm)
−10
−8
−6
−4
−2
0
2
4
6
8
10
x (mm)

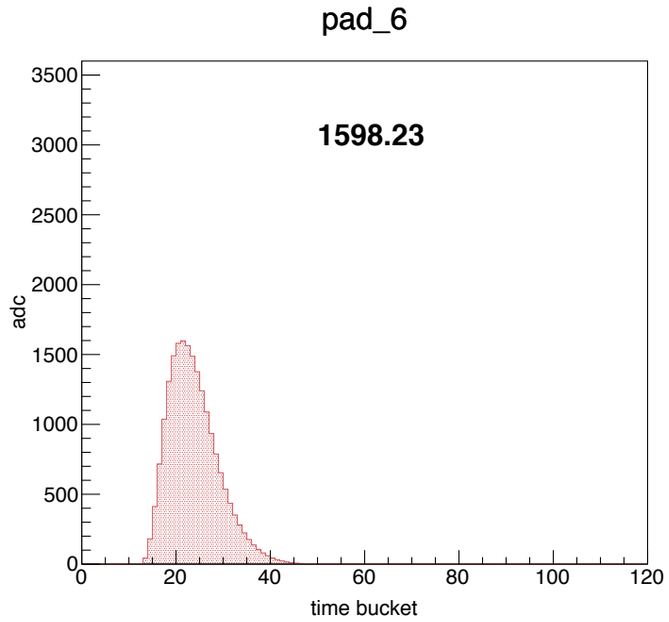

pad_1
69.14
adc
time bucket

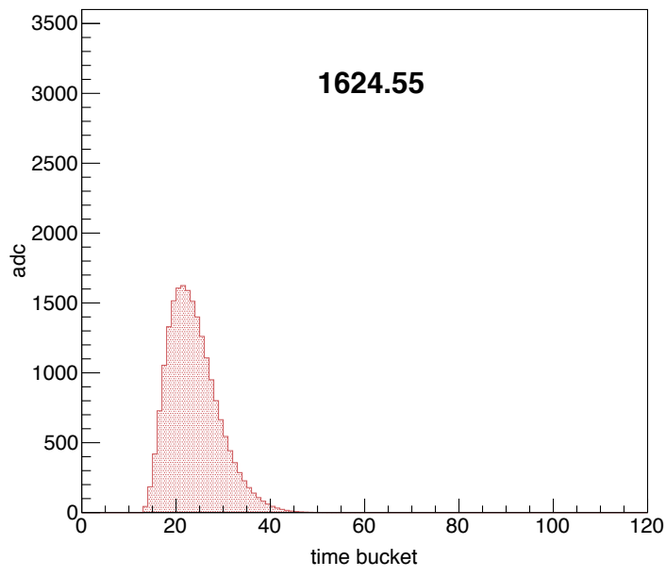

pad_2
1696.10
adc
time bucket

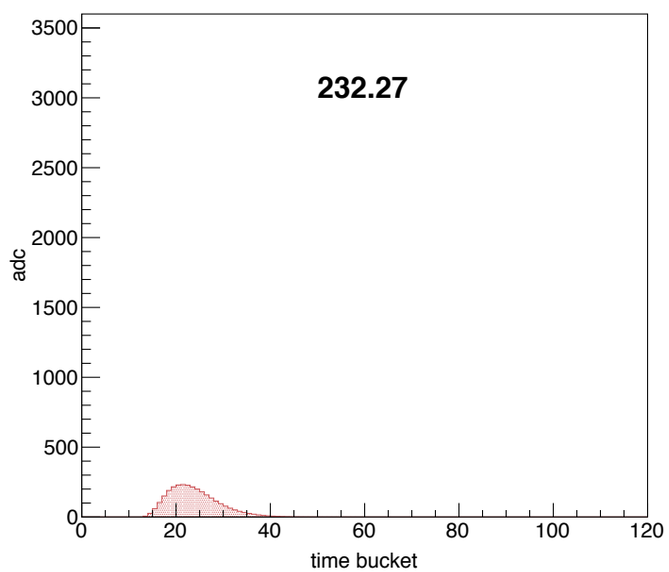

pad_3
1702.97
adc
time bucket


2.5 mm example
y (mm)
x (mm)

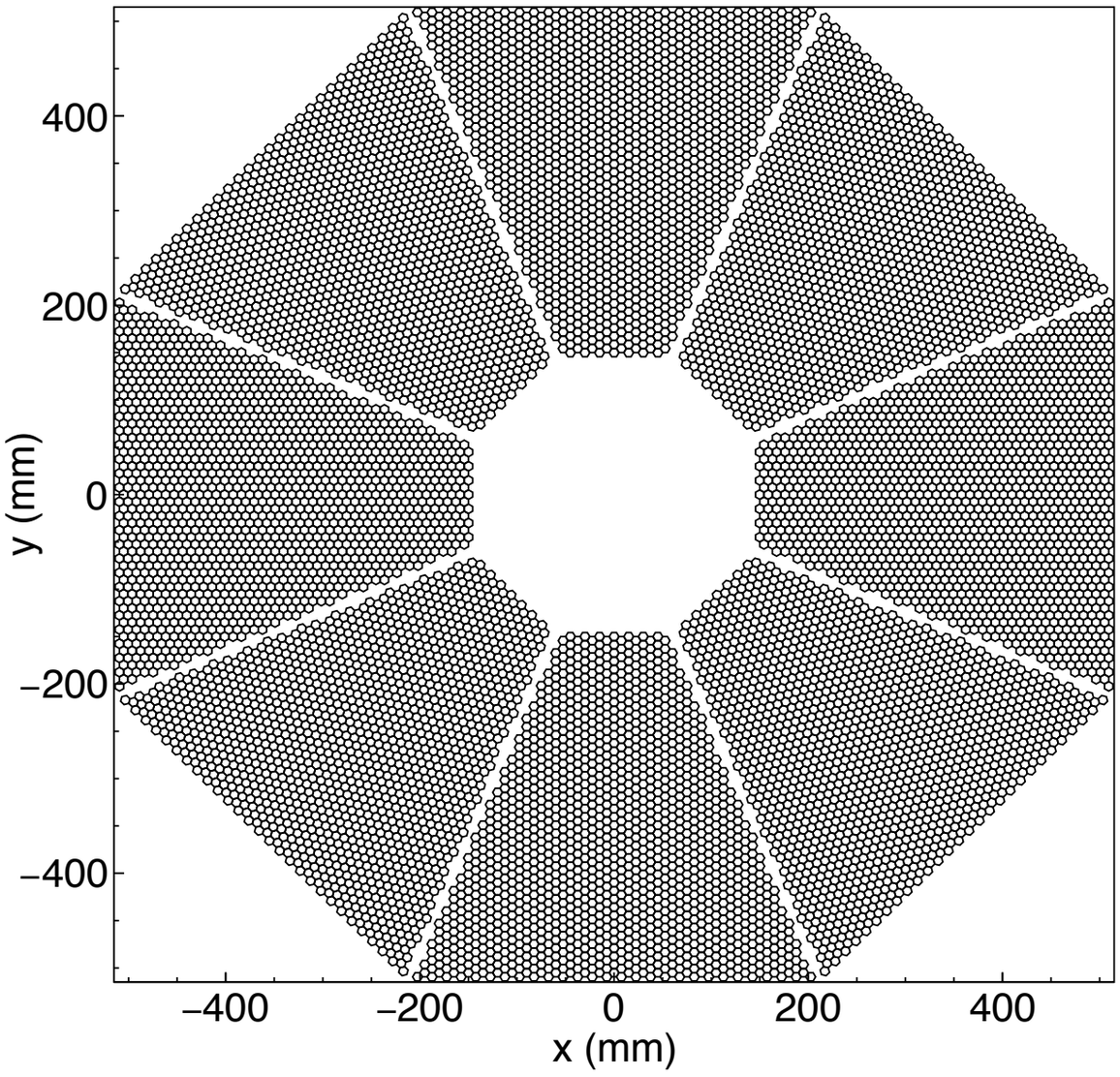

pad_0
3491.46
adc
time bucket


pad_6
1598.23
adc
time bucket

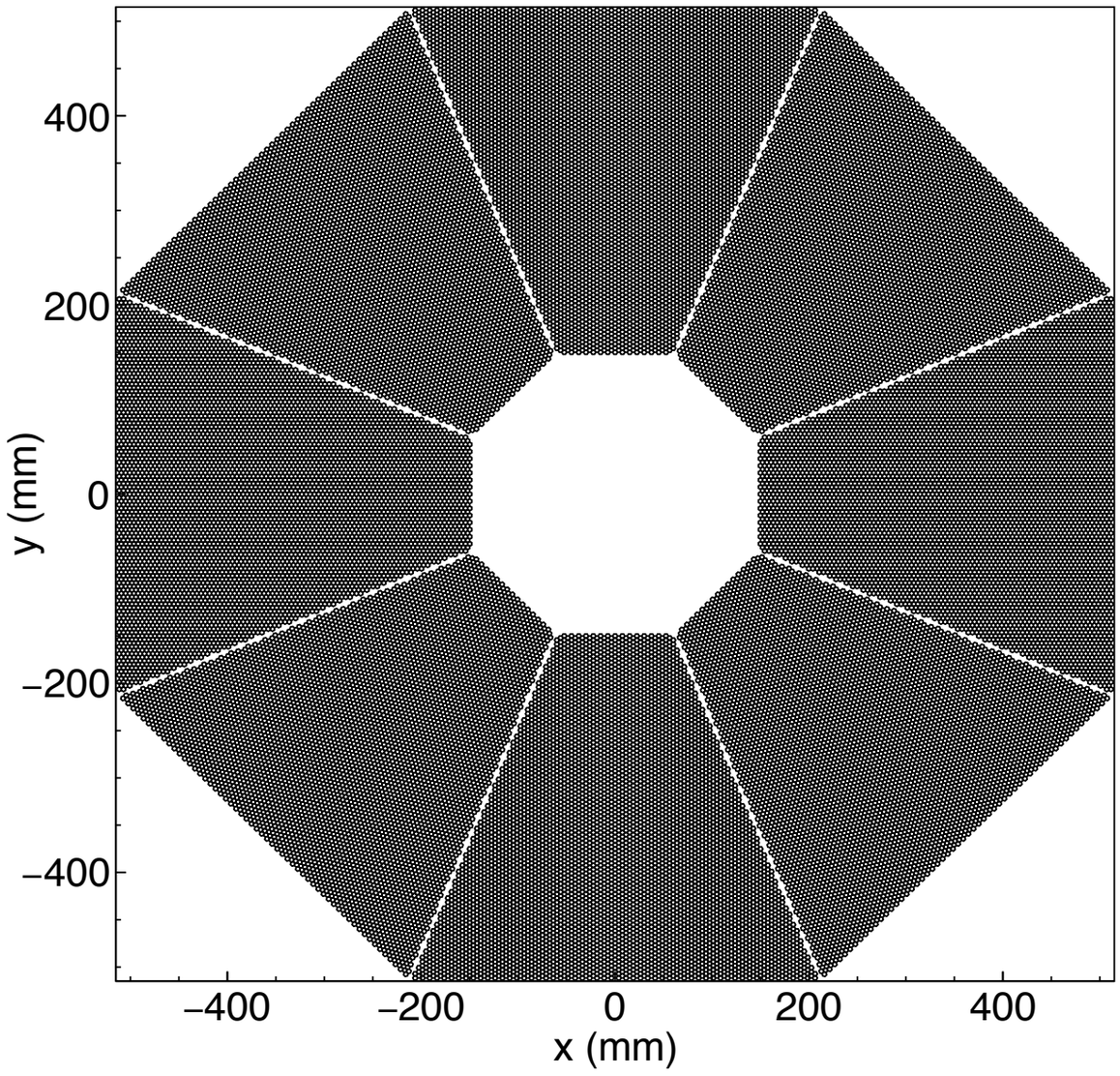

pad_5
1624.55
adc
time bucket


pad_4
232.27
adc
time bucket

Hexagonal Pad



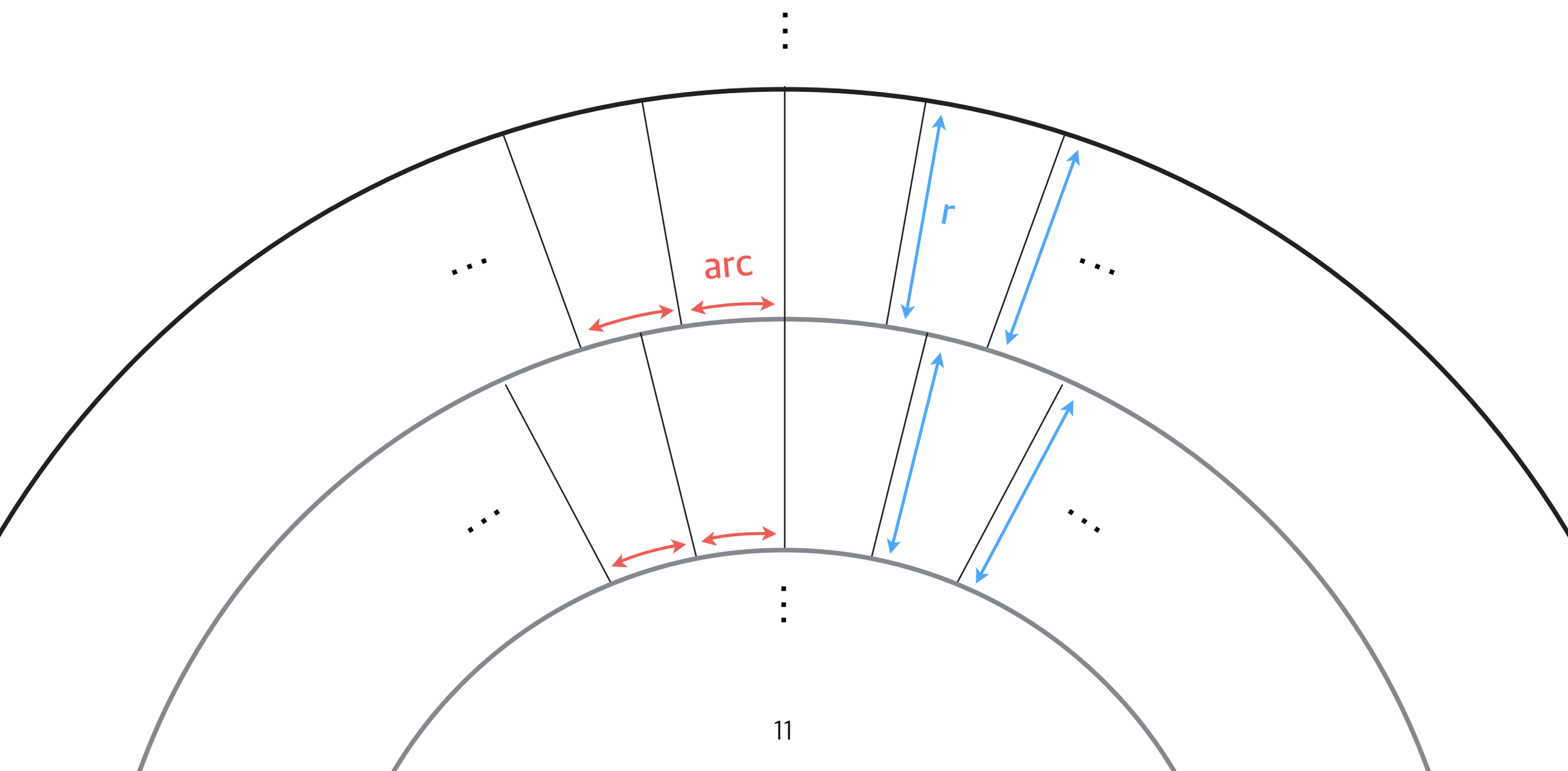
Hexagonal Pad 5 mm (#23136)



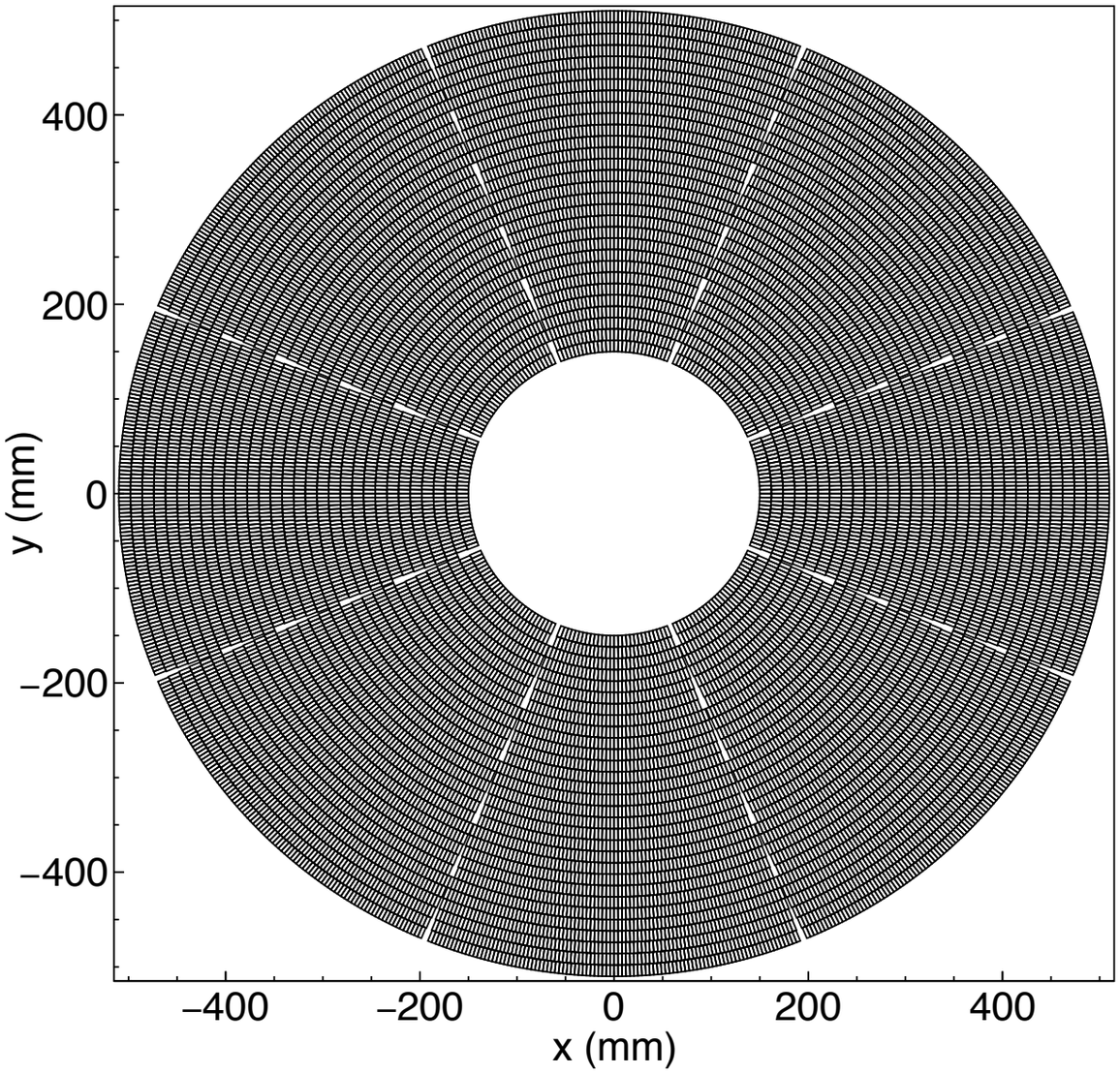
Hexagonal Pad 2.5 mm (#95552)

Fan Shape Pad

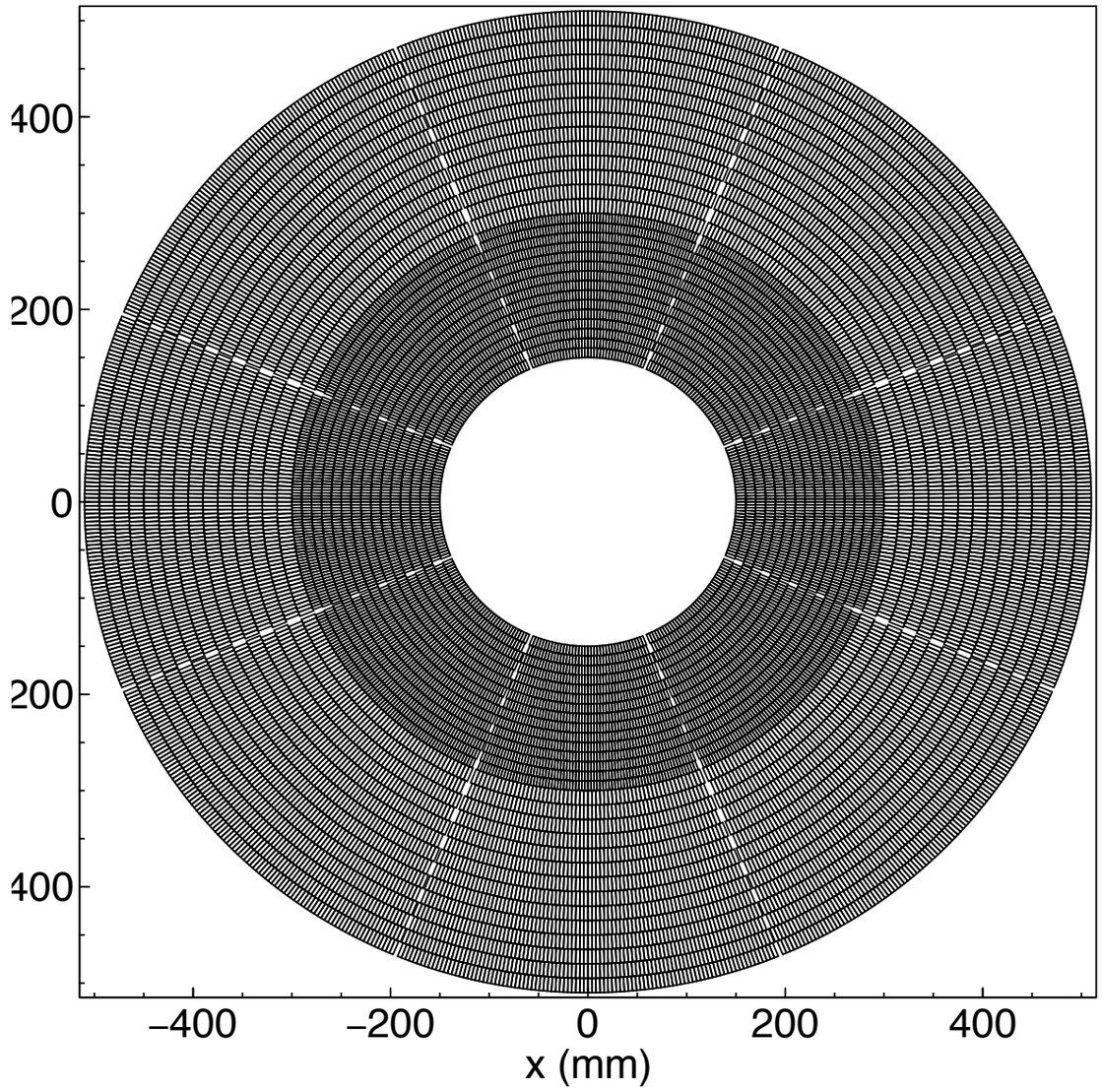
- Pad with length of bottom side arc and length through radial is fixed.



Fan Shape Pad



Fan Pad 4x12 mm (#30048)



Fan Pad 3x10, 4x15 mm (#30816)

Fan Shape Pad

- Is it Realistic?

- Reconstructed momentum is no accurate.
  - Reconstructed position is not well matched with MC position. Because longer pads cover more time buckets which will increase the width of the pulse.

- Clustering is rather easy and clear: sum over rows in one layer.

- Error of pad?