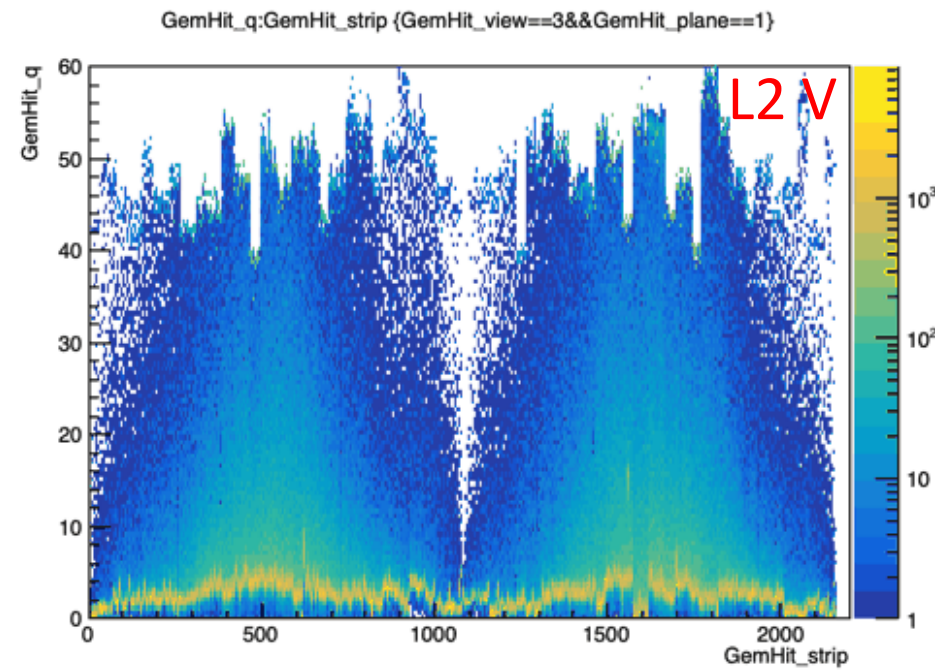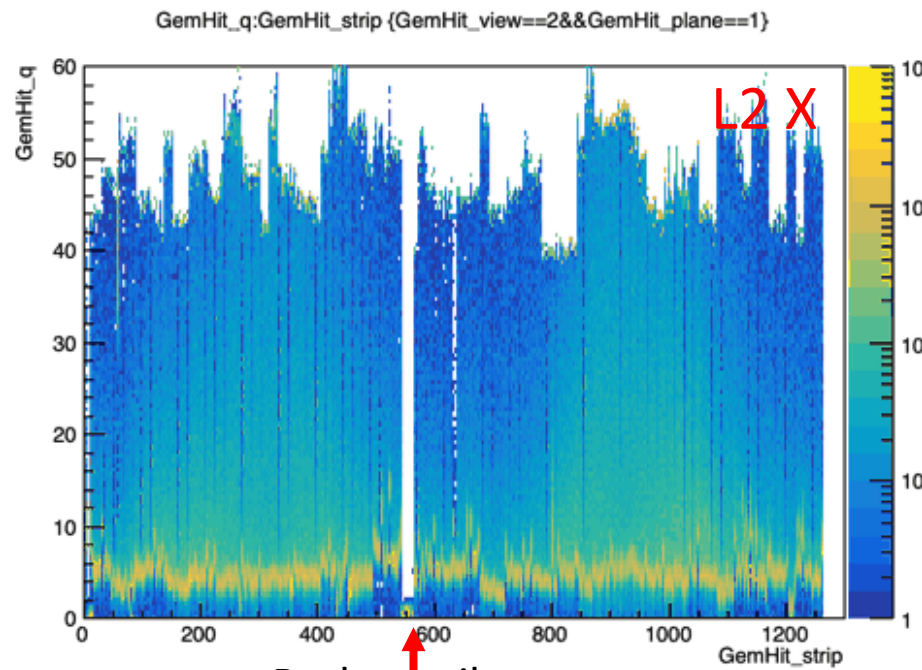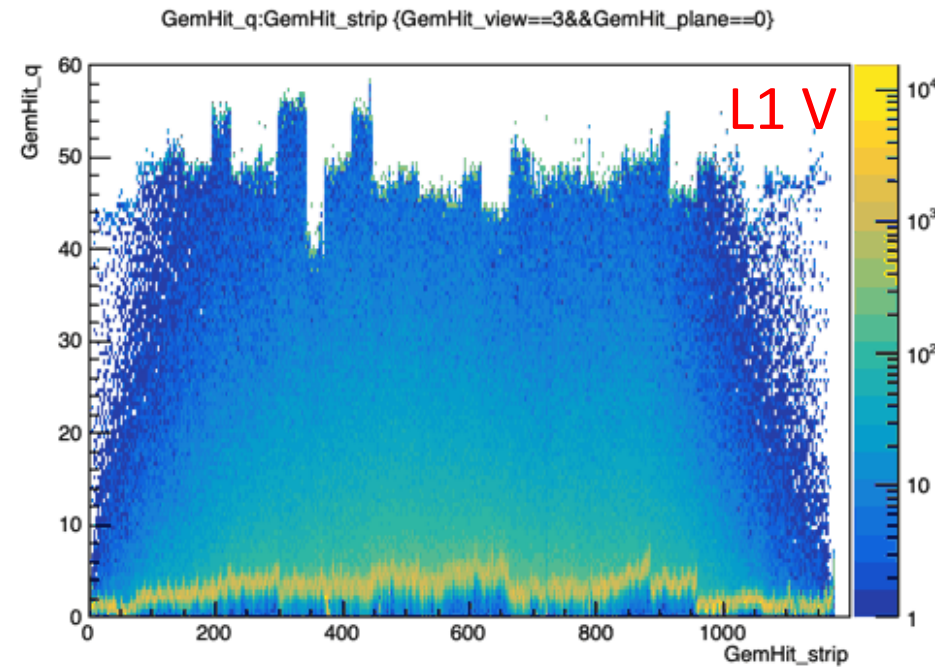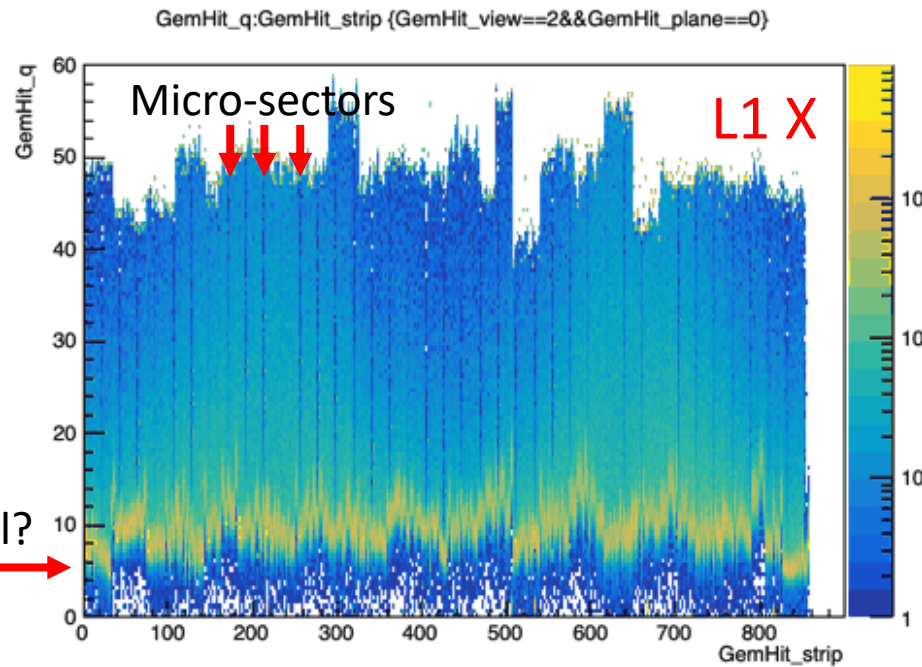# With or without cosmics

(check of data w/ and w/o cosmics)

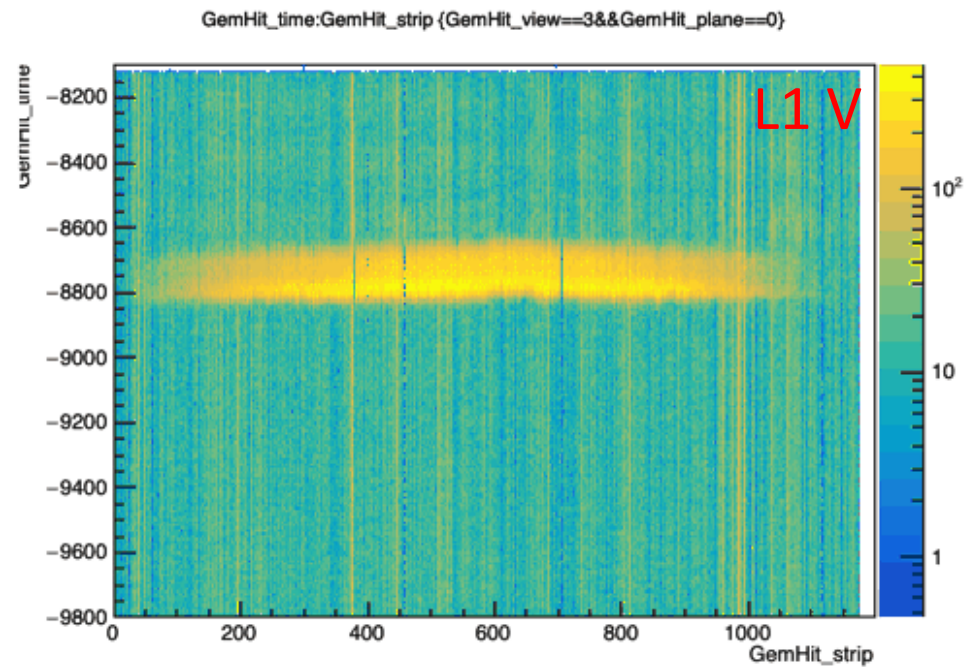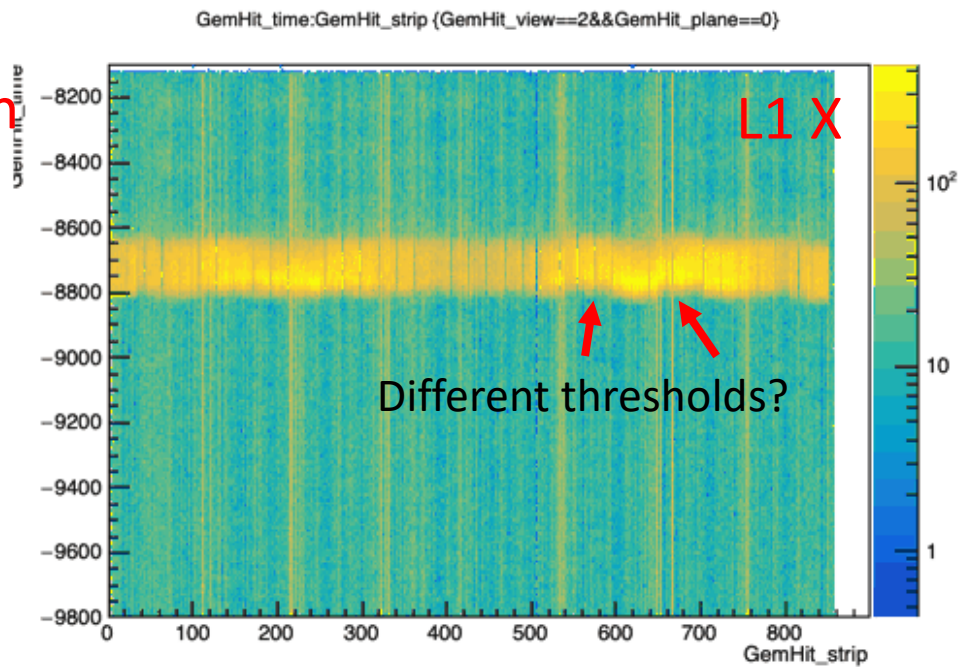Stefano Spataro
30 – March - 2020

Run 17

Nothing news from the plots,
Just few comments about
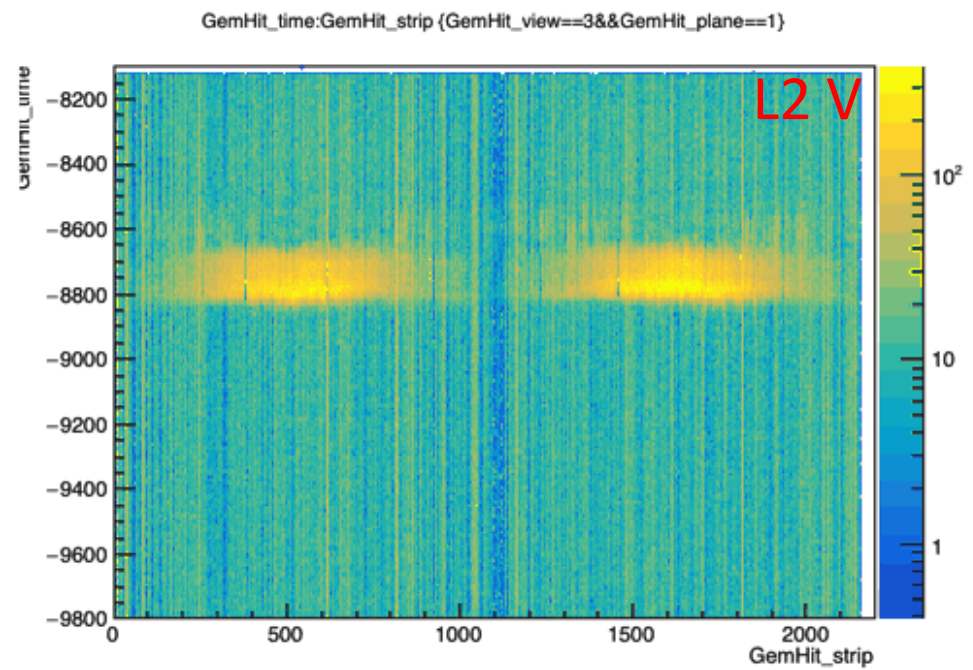
Charge Distribution

Micro-sectors

Noise or signal?

L1 X

L1 V

L2 X

L2 V

Broken tails

Time Distribution

L1 X

Different thresholds?

L1 V

Noise

Signal

Noise

L2 X

L2 V

GemHit_time:GemHit_strip {GemHit_view==2&&GemHit_plane==0}

GemHit_time:GemHit_strip {GemHit_view==3&&GemHit_plane==0}

GemHit_time:GemHit_strip {GemHit_view==2&&GemHit_plane==1}

GemHit_time:GemHit_strip {GemHit_view==3&&GemHit_plane==1}
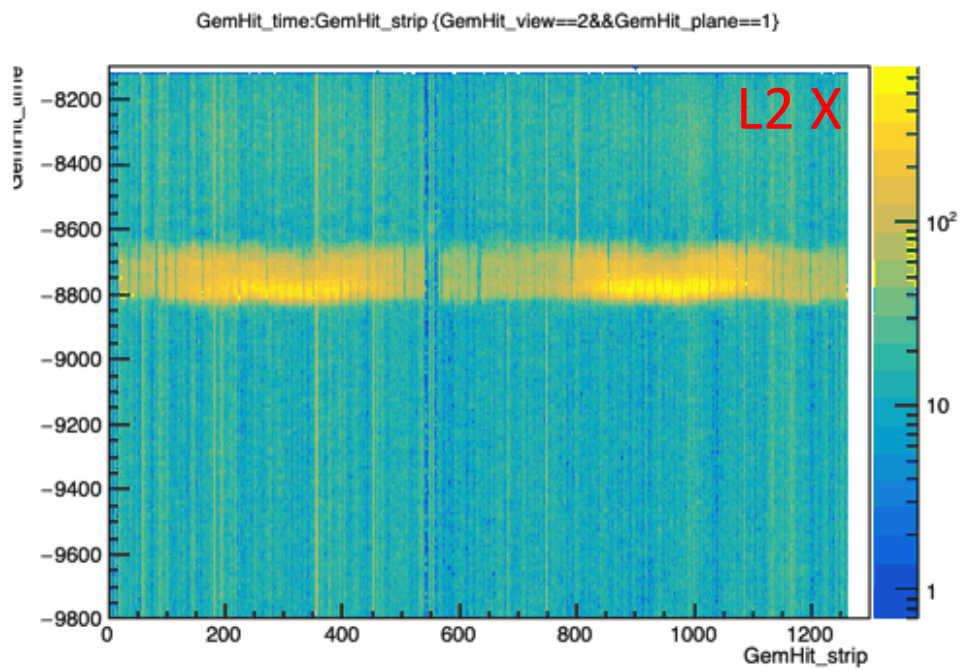
Strip Occupancy

GemHit_strip {GemHit_view==2&&GemHit_plane==0}

BOTTOM   TOP   L1 X
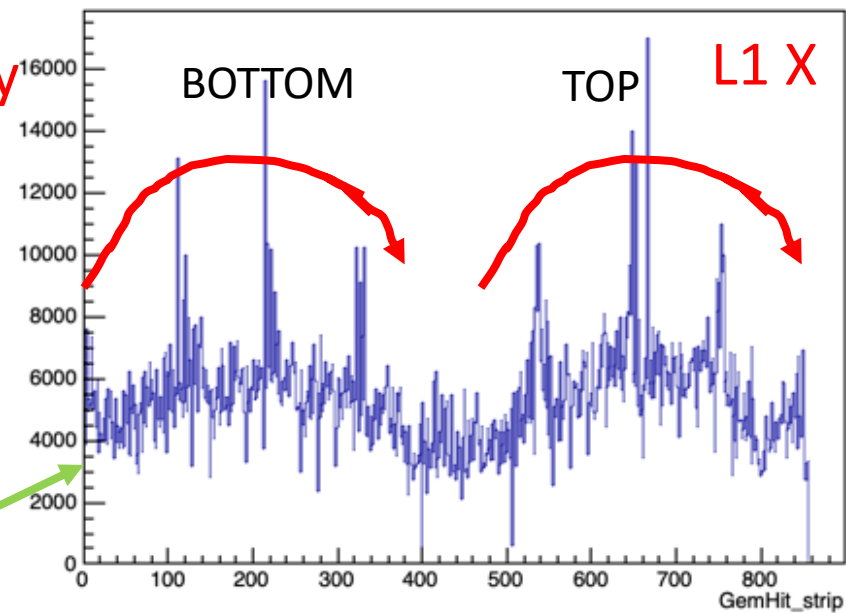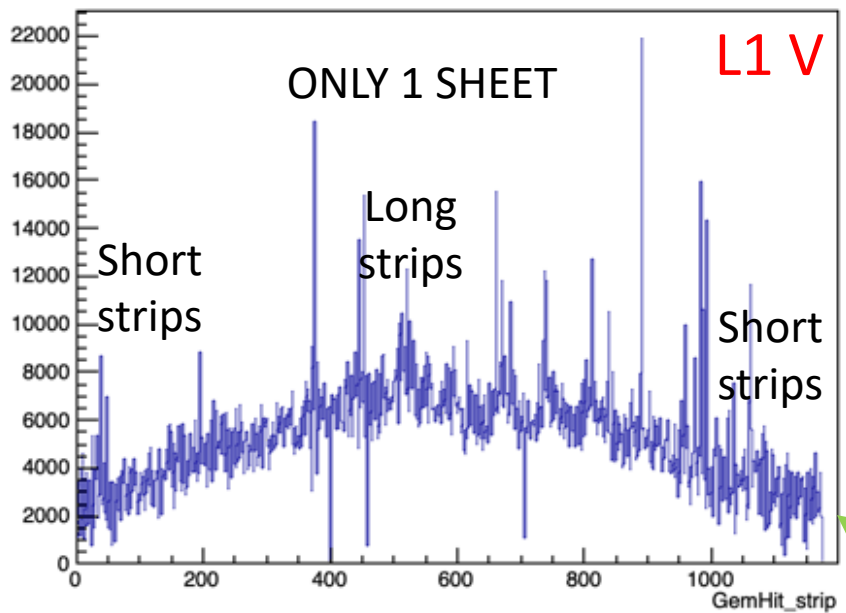
Cosmics acceptance

GemHit_strip {GemHit_view==3&&GemHit_plane==0}
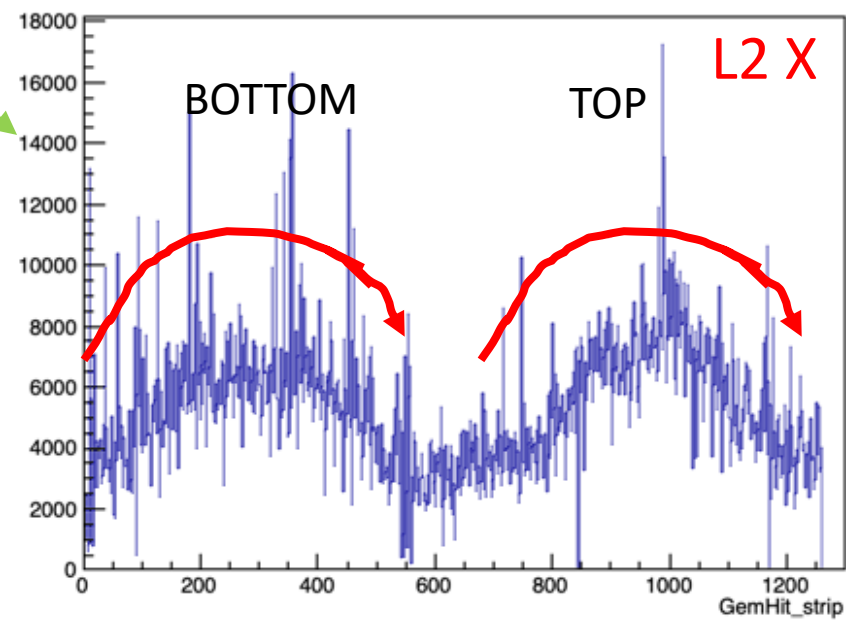
ONLY 1 SHEET   L1 V

Short strips   Long strips   Short strips

GemHit_strip {GemHit_view==2&&GemHit_plane==1}

BOTTOM   TOP   L2 X

GemHit_strip {GemHit_view==3&&GemHit_plane==1}

BOTTOM   TOP   L2 V

Long   Long

Short   Short   Short
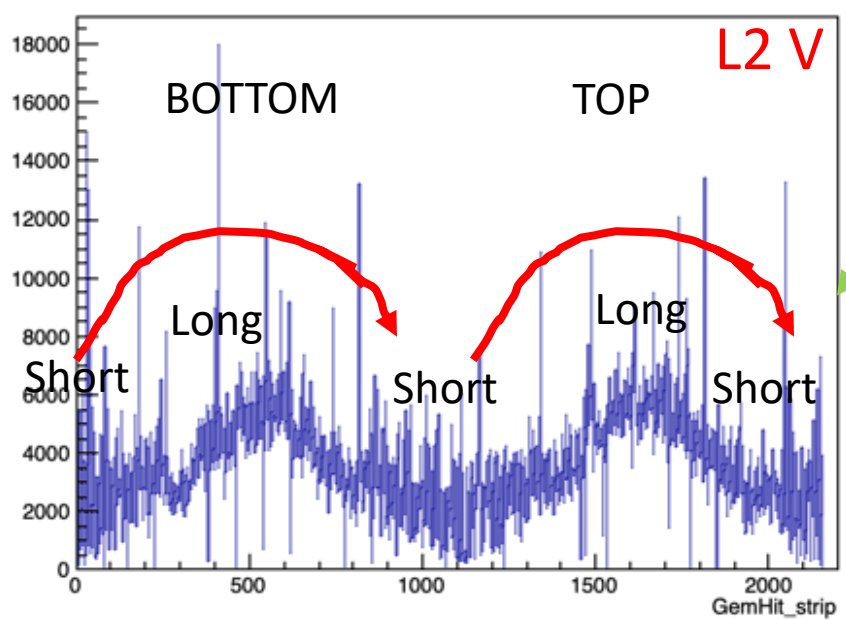
Strip length

A run was taken with low gain, for testing

HV set to 200V everywhere
Low voltage, no signal from cosmics, only noise

Charge Distribution

Only noise as expected

GemHit_q:GemHit_strip {GemHit_view==2&&GemHit_plane==0}

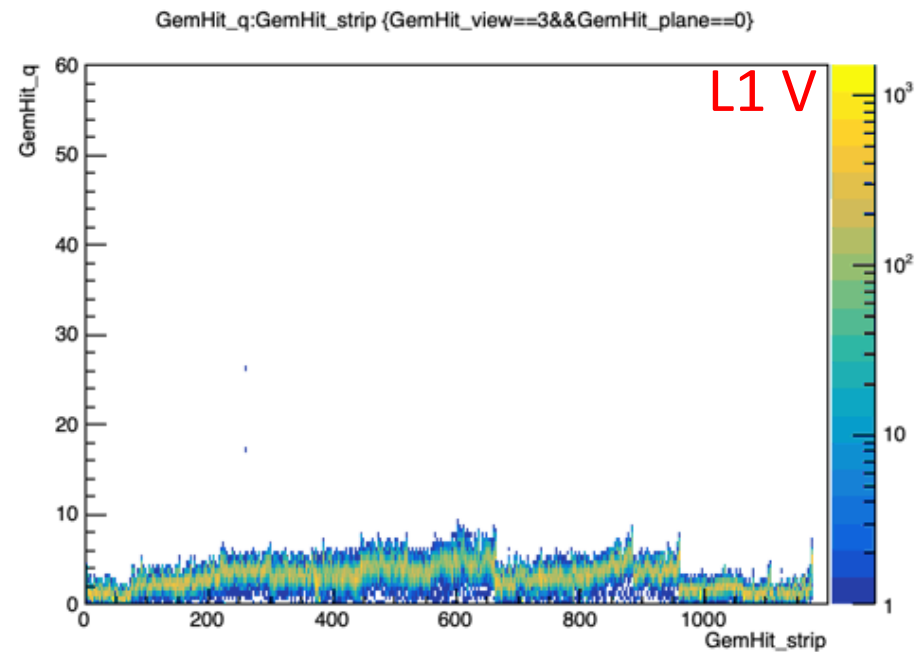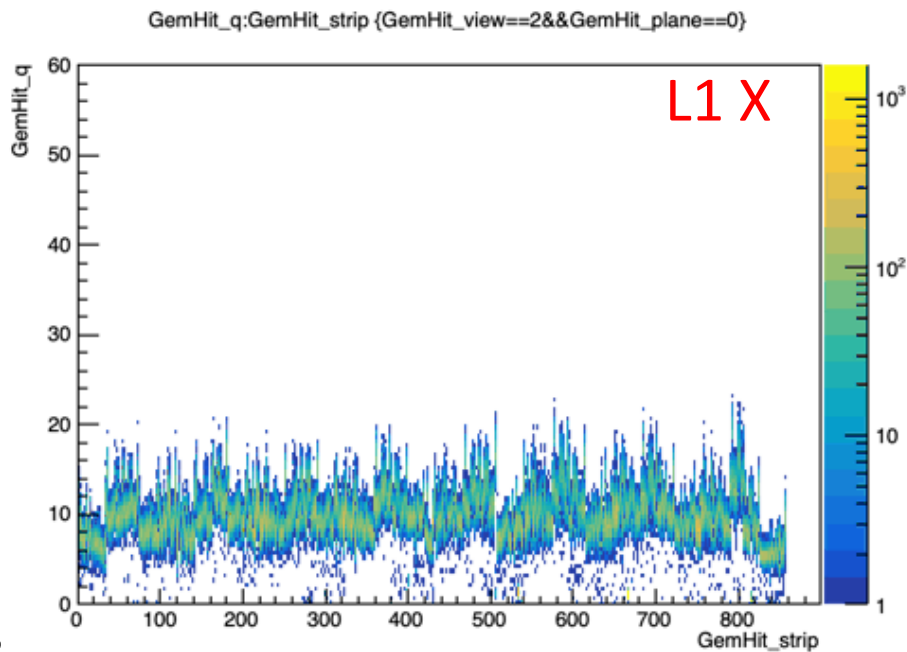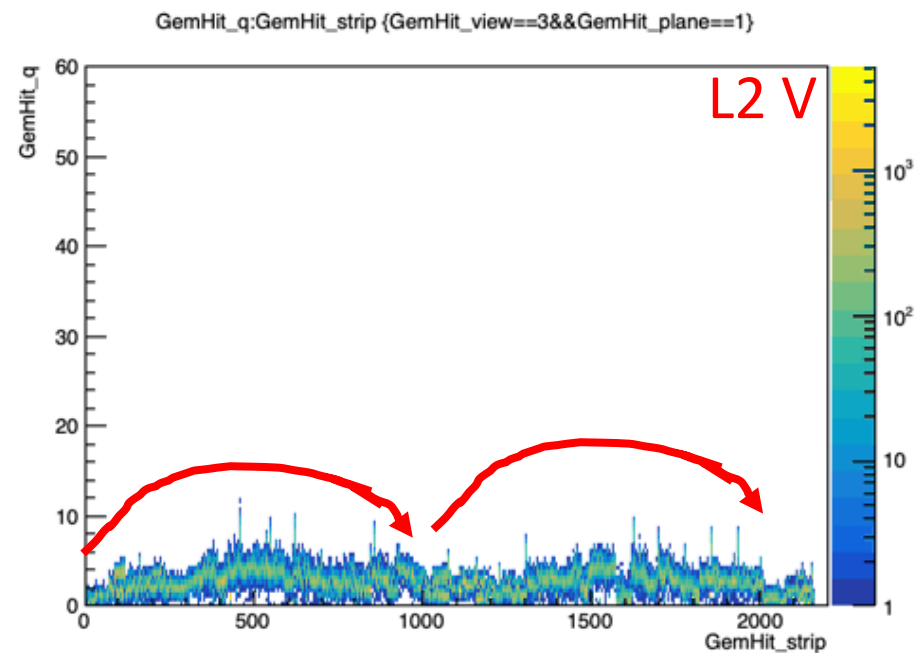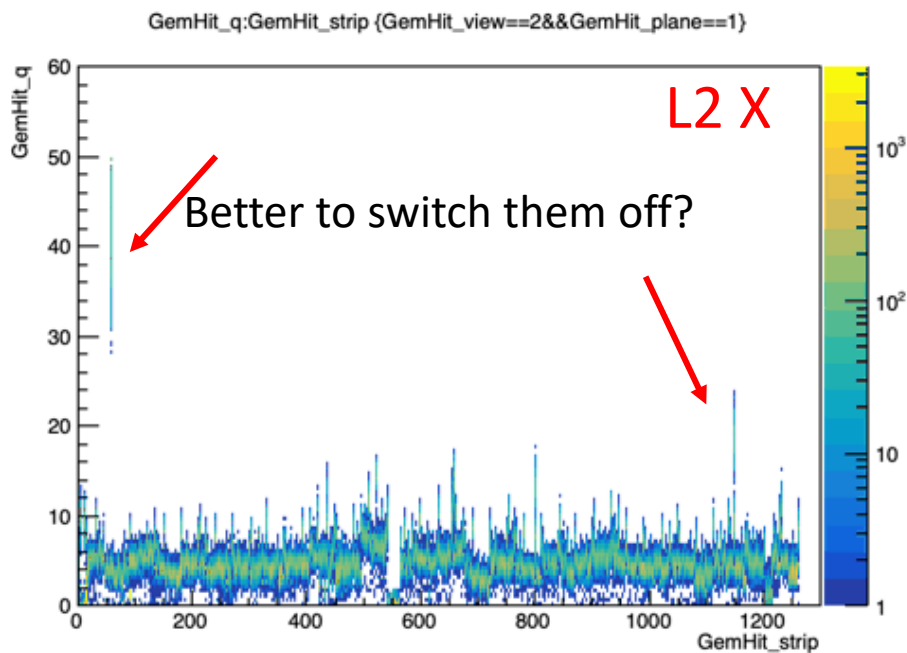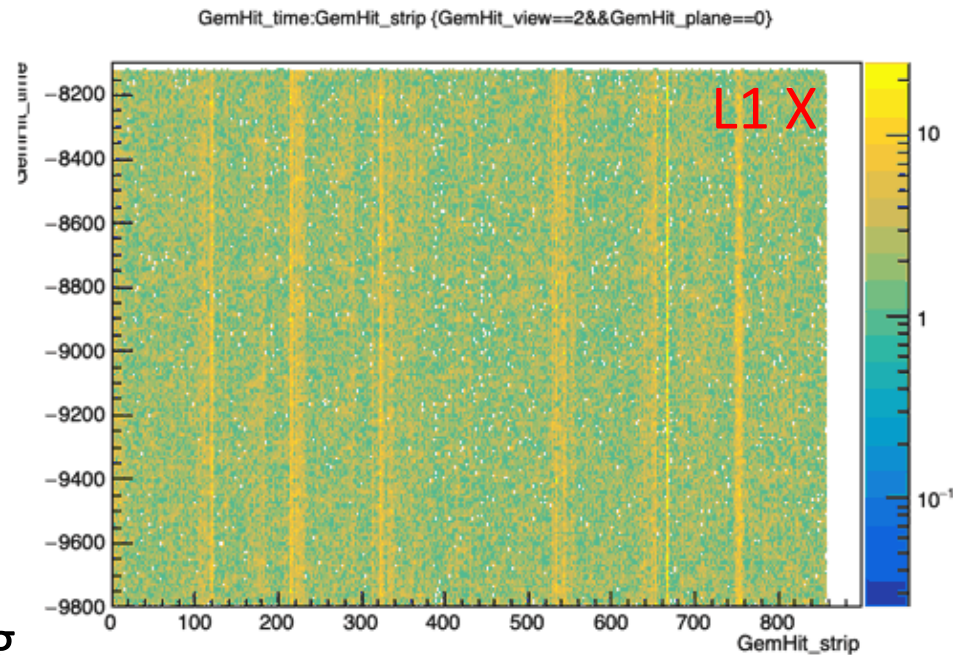L1 X

GemHit_q:GemHit_strip {GemHit_view==3&&GemHit_plane==0}

L1 V

GemHit_q:GemHit_strip {GemHit_view==2&&GemHit_plane==1}

L2 X

Better to switch them off?

GemHit_q:GemHit_strip {GemHit_view==3&&GemHit_plane==1}

L2 V

Time Distribution

GemHit_time:GemHit_strip {GemHit_view==2&&GemHit_plane==0}

L1 X

GemHit_time:GemHit_strip {GemHit_view==3&&GemHit_plane==0}

L1 V

everything flat as expected

GemHit_time:GemHit_strip {GemHit_view==2&&GemHit_plane==1}

L2 X

GemHit_time:GemHit_strip {GemHit_view==3&&GemHit_plane==1}

L2 V

Strip Occupancy
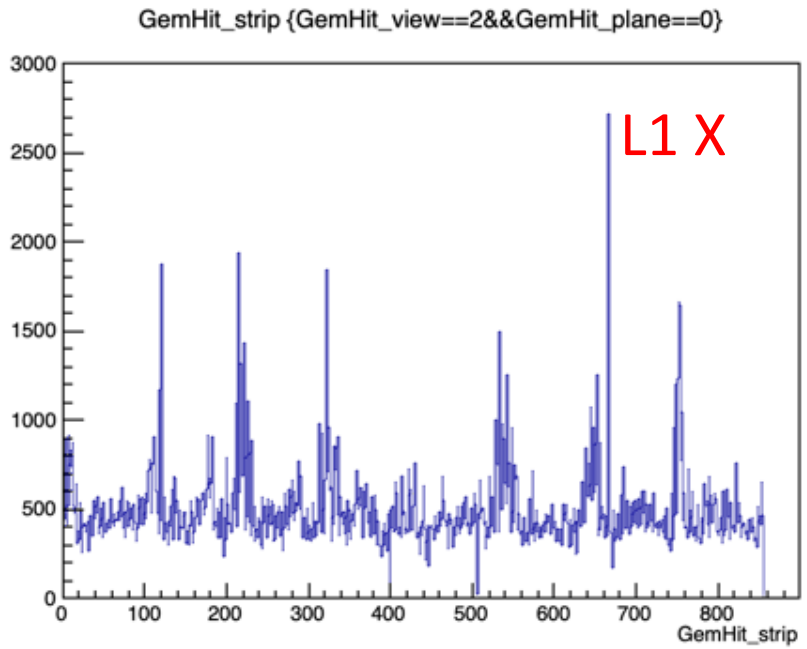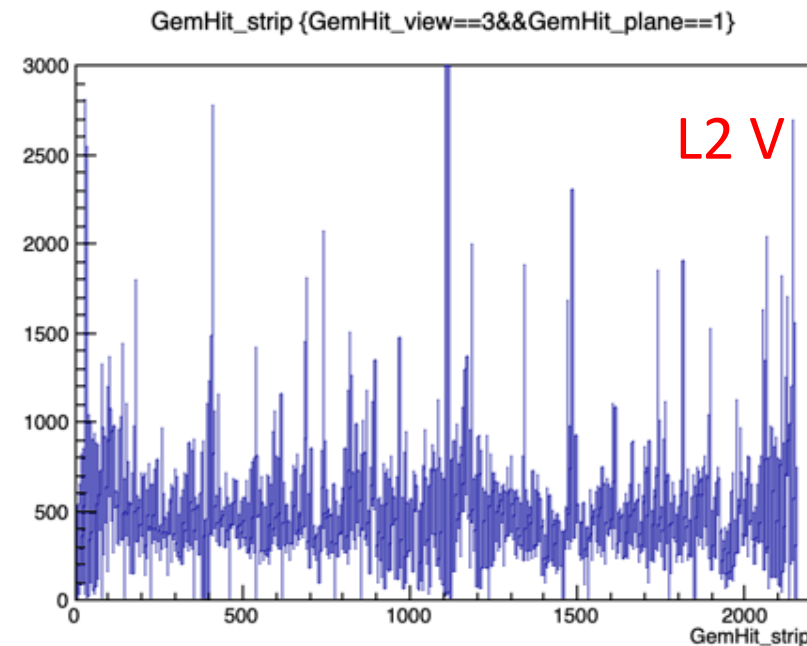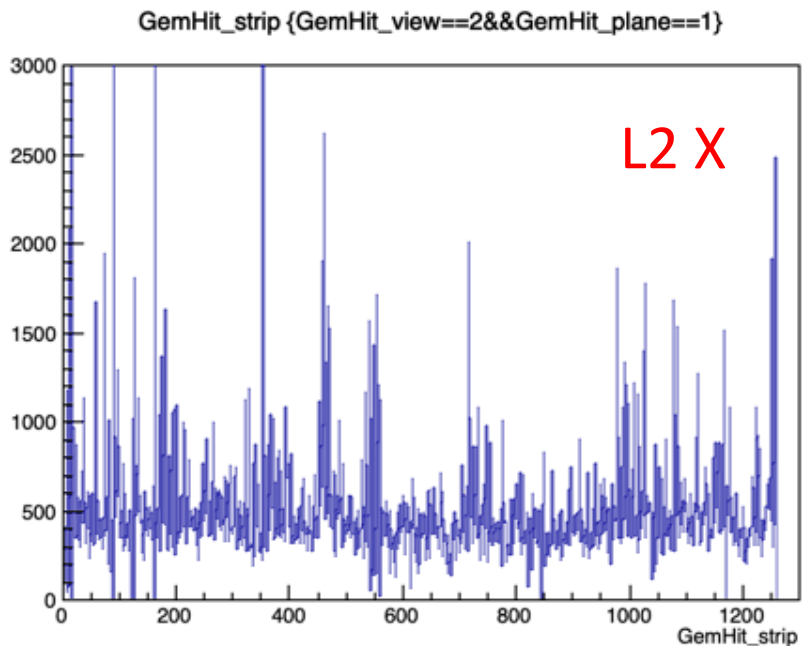
everything flat
as expected

with few bumps
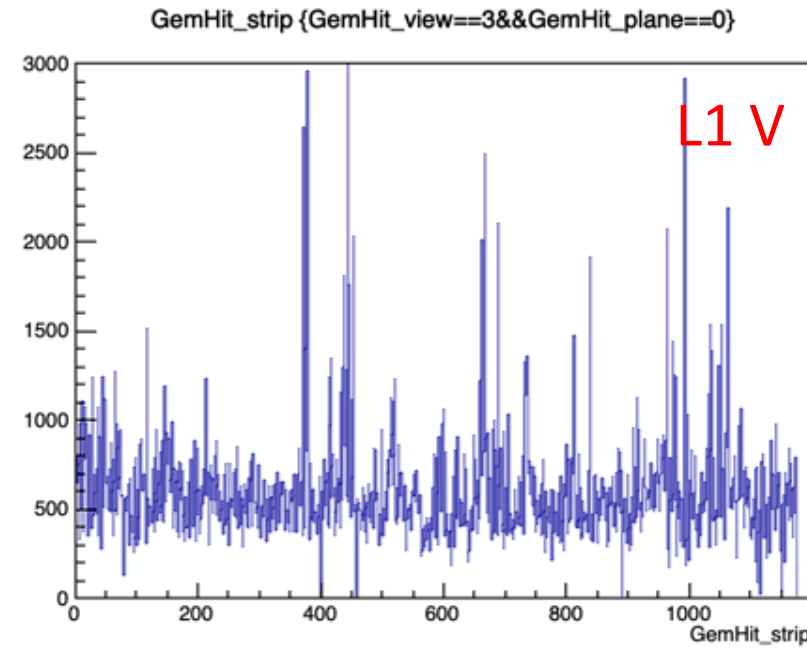
This is the reason why we
have different thresholds:
constant noise rate

GemHit_strip {GemHit_view==2&&GemHit_plane==0}

L1 X

GemHit_strip {GemHit_view==3&&GemHit_plane==0}

L1 V

GemHit_strip {GemHit_view==2&&GemHit_plane==1}

L2 X

GemHit_strip {GemHit_view==3&&GemHit_plane==1}

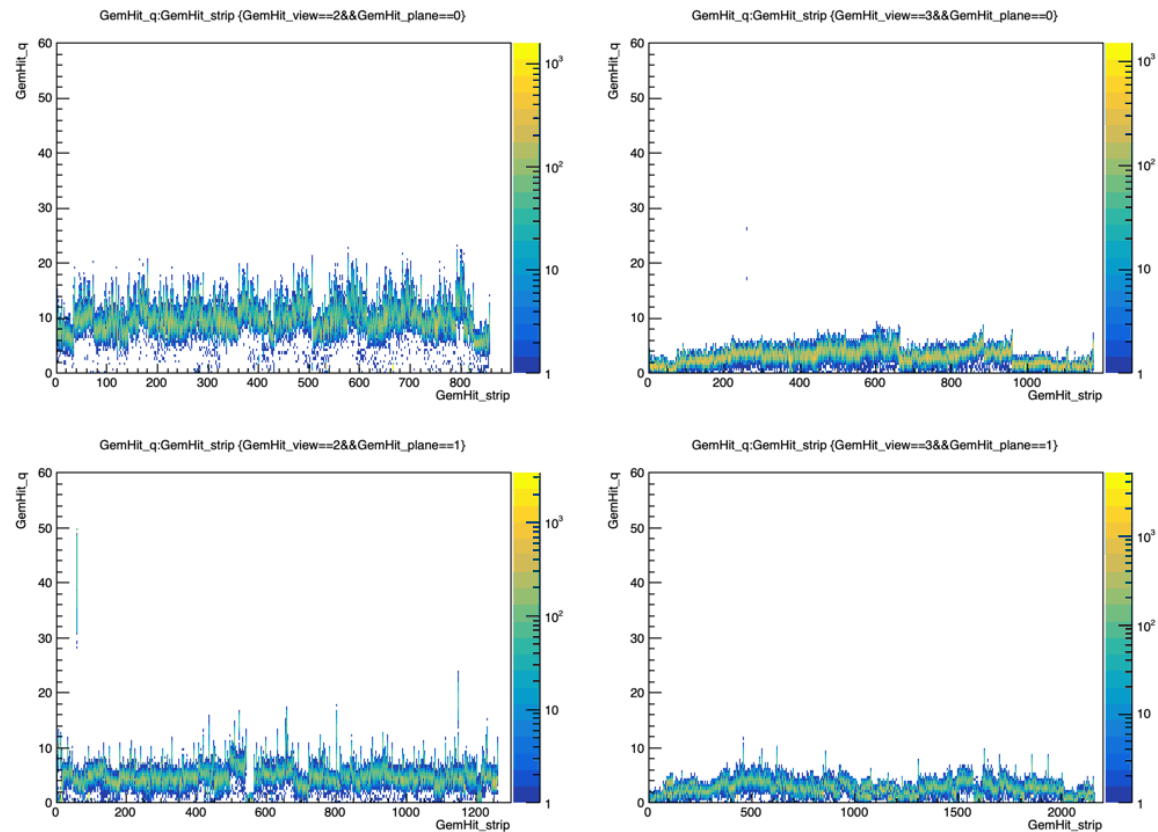L2 V

Question?

The low charge signals are only noise or also particle signals?
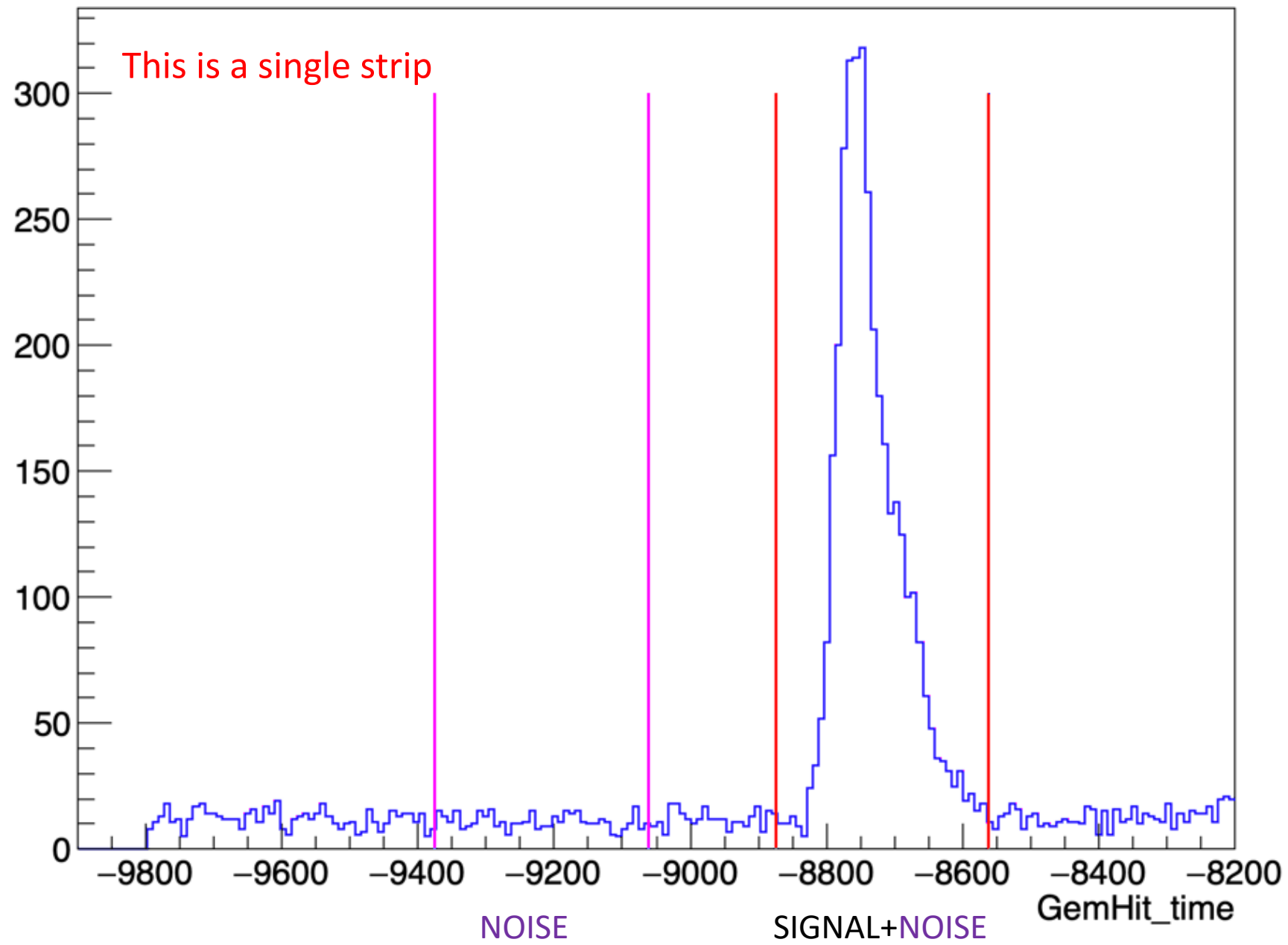
Can we cut on charge to clean the events?

GemHit_time {GemHit_strip==200&GemHit_view==2&&GemHit_plane==0}
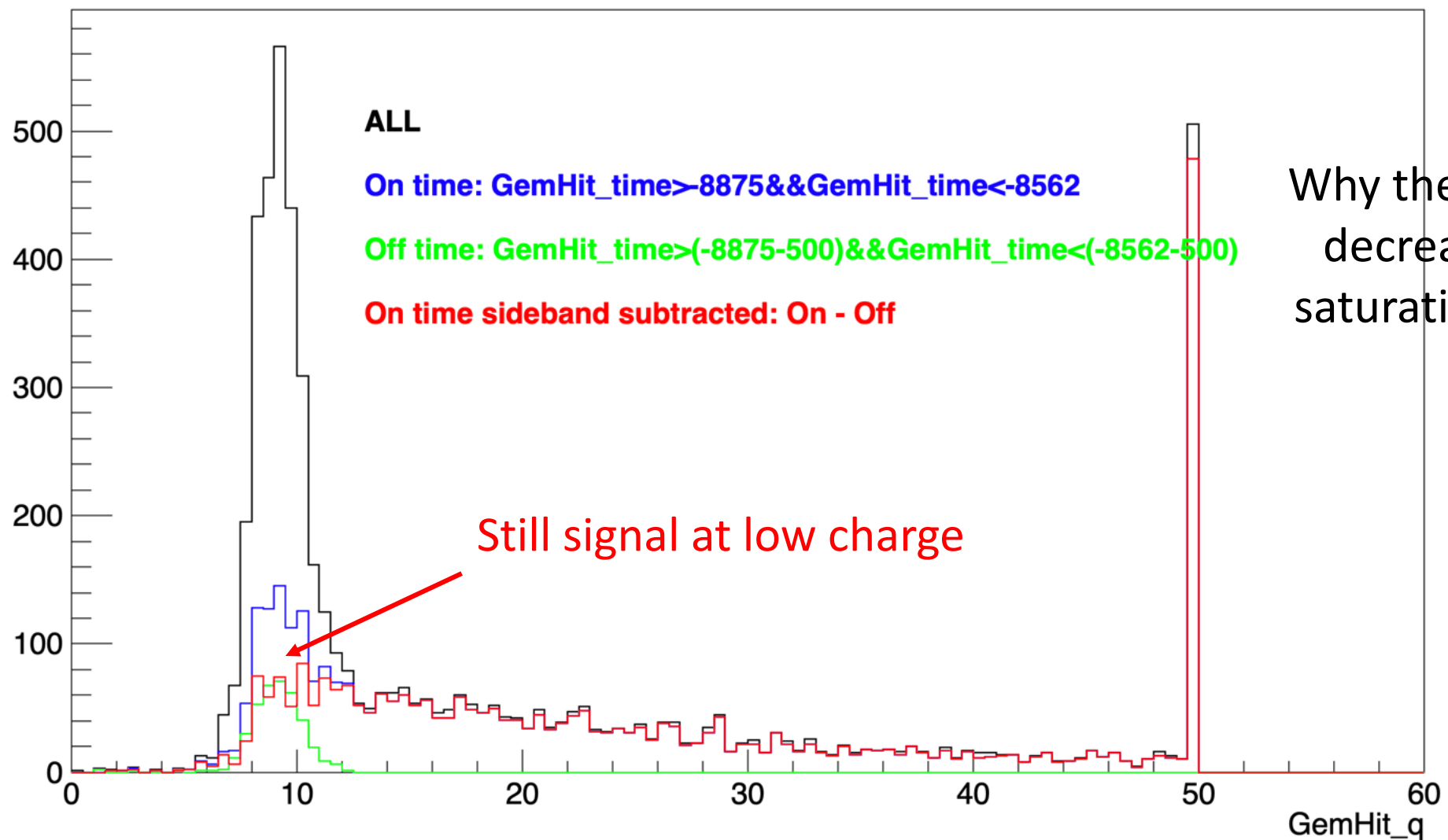
The idea:

Charge inside signal window
-
Charge outside signal window
=
Charge of signal

This is a single strip

NOISE   SIGNAL+NOISE

GemHit_time

L1 X strip 200

GemHit_q {GemHit_strip==200&GemHit_view==2&&GemHit_plane==0}

ALL

On time: GemHit_time>-8875&&GemHit_time<-8562

Off time: GemHit_time>(-8875-500)&&GemHit_time<(-8562-500)

On time sideband subtracted: On - Off

Still signal at low charge

Why the time cut decreases the saturation peak?
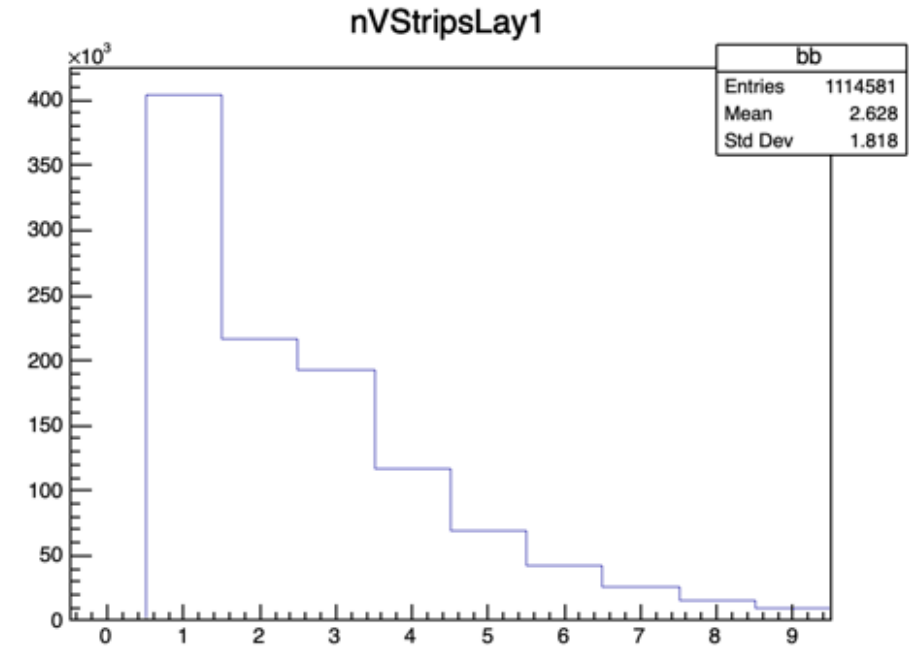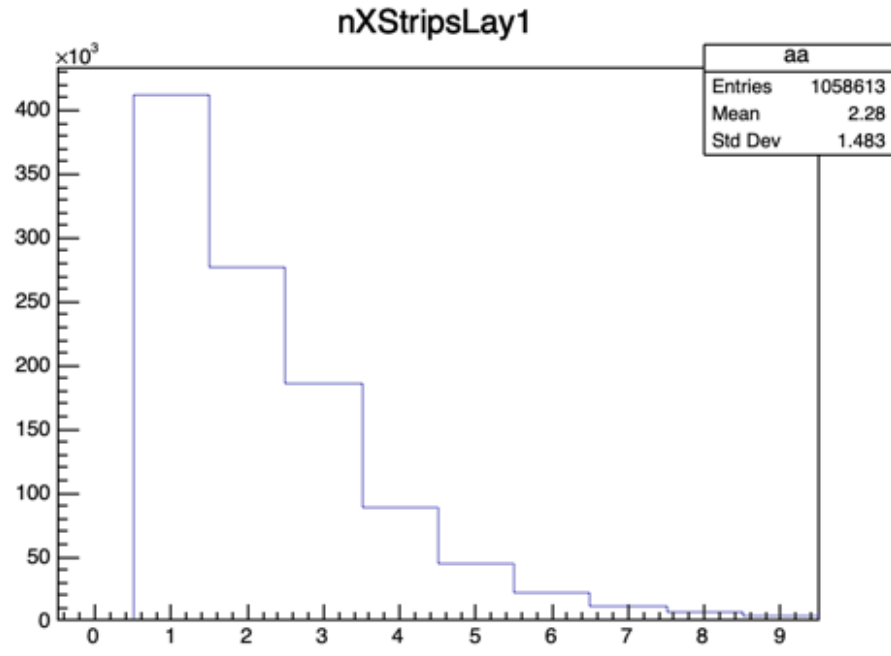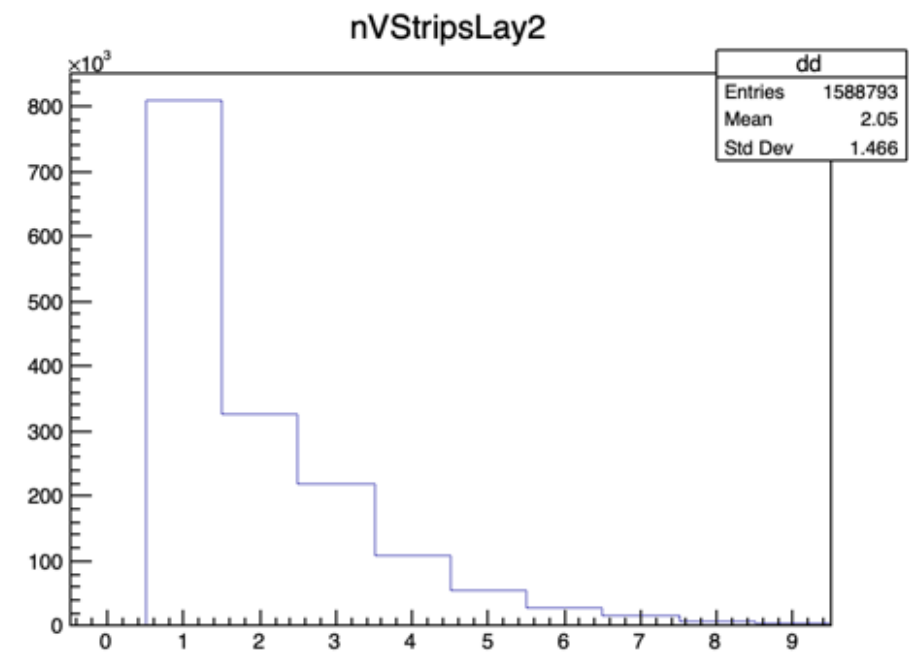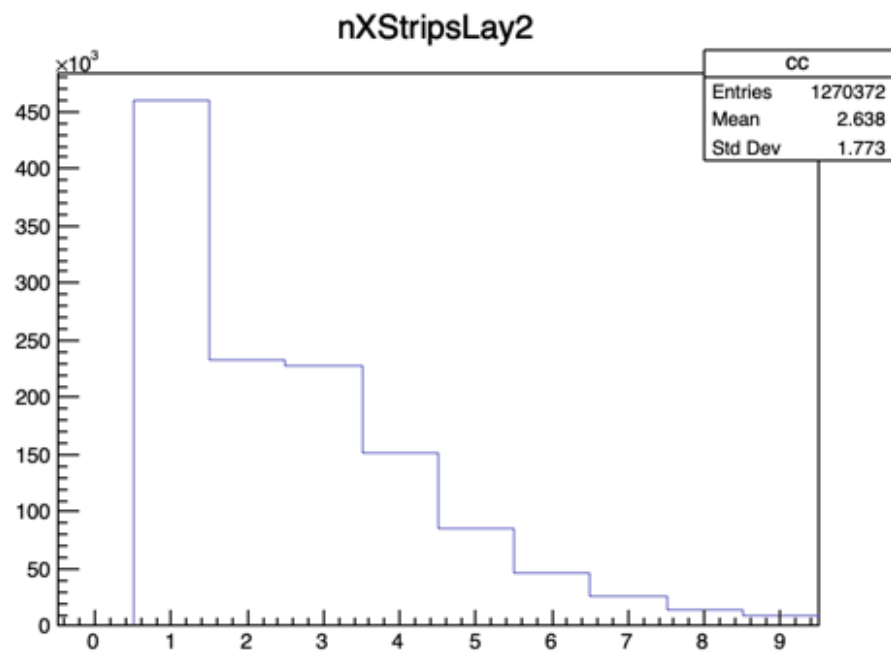
Warning! – Strip Mapping

The plots before were done with GRAAL strip definition, sorry

GemHit_strip:GemHit_strip_boss
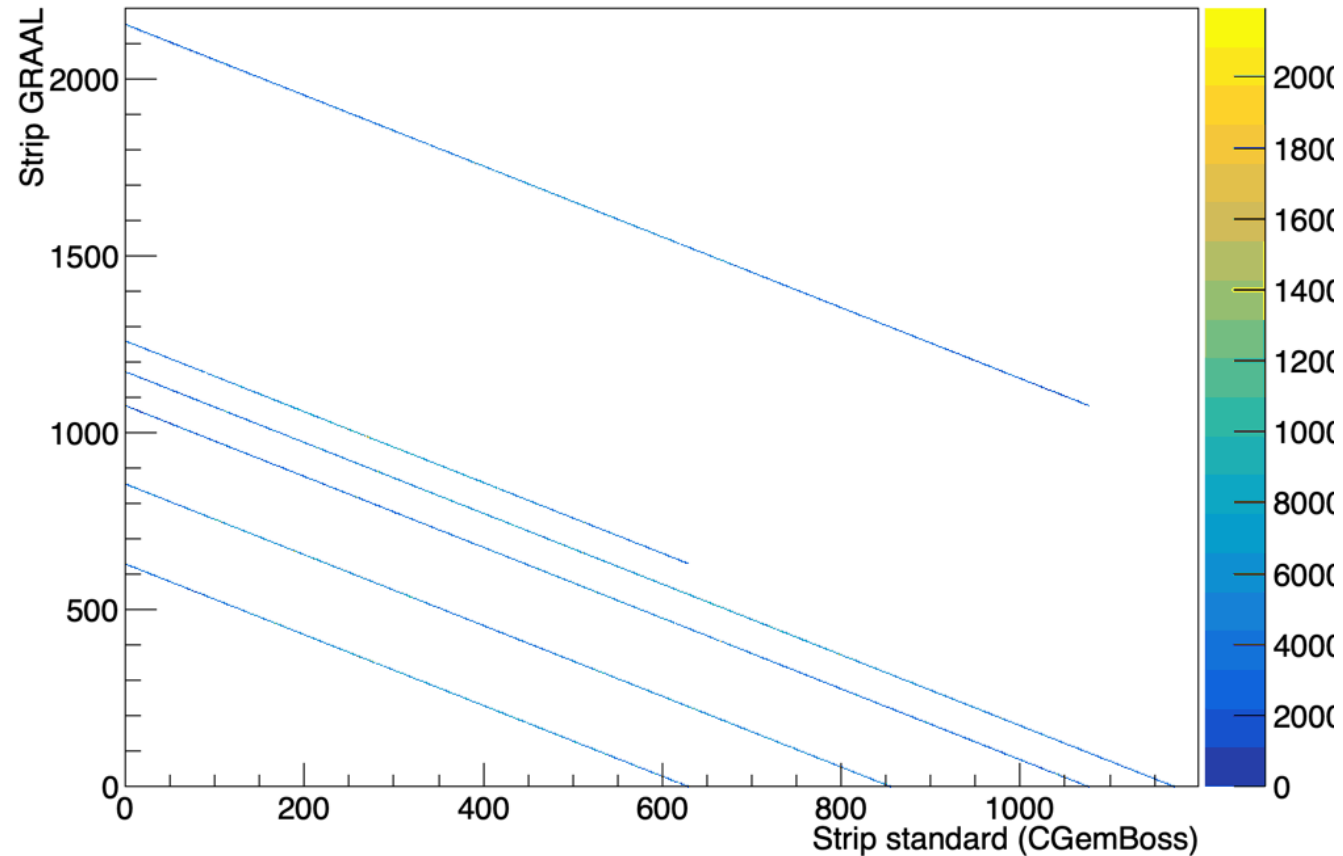
What at cluster level ?
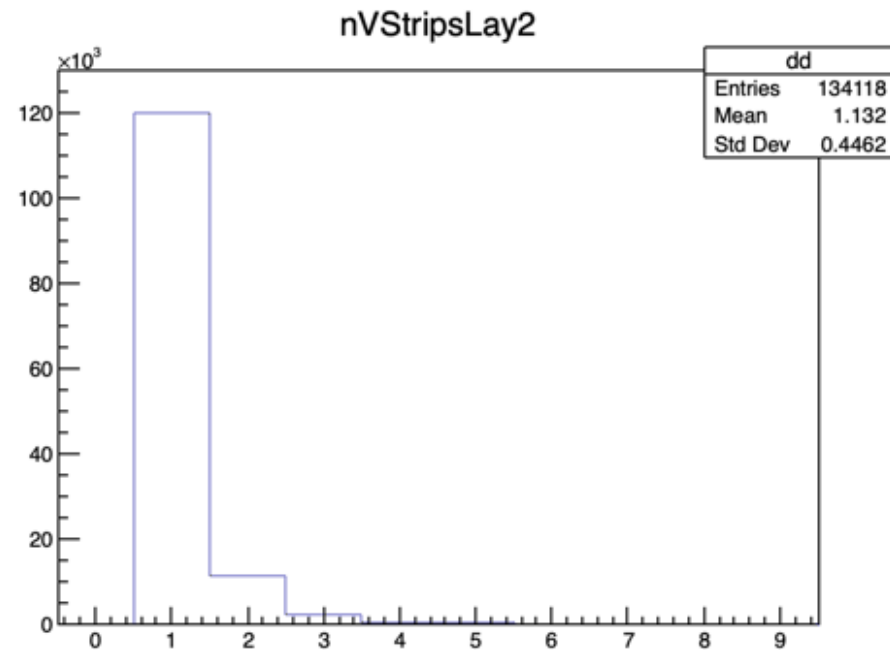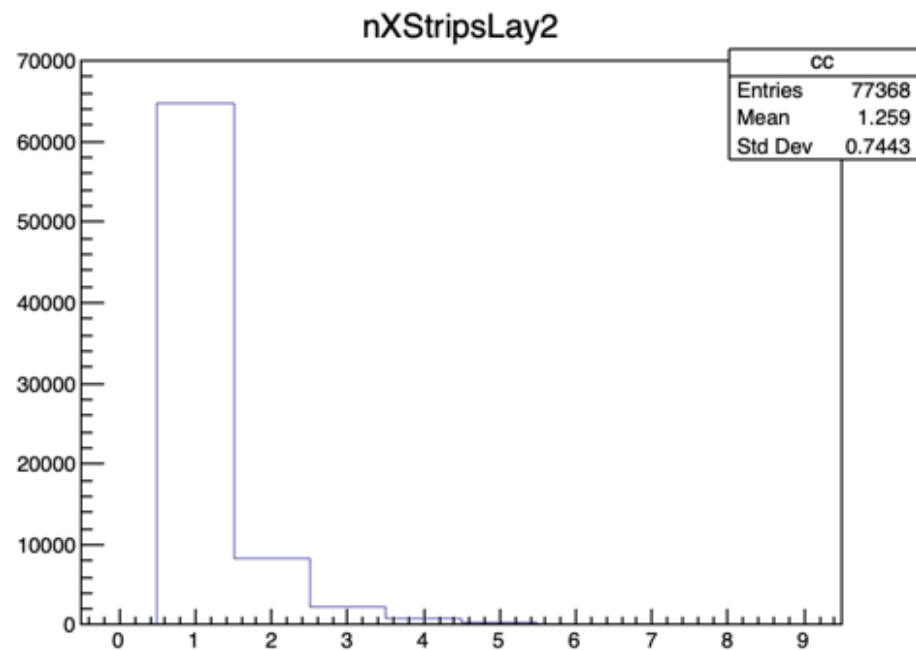
Run 17

nXStripsLay1

aa	
Entries	46589
Mean	1.337
Std Dev	0.8366

nVStripsLay1

bb	
Entries	70795
Mean	1.315
Std Dev	0.8051

Low HV

nXStripsLay2

cc	
Entries	77368
Mean	1.259
Std Dev	0.7443

nVStripsLay2

dd	
Entries	134118
Mean	1.132
Std Dev	0.4462
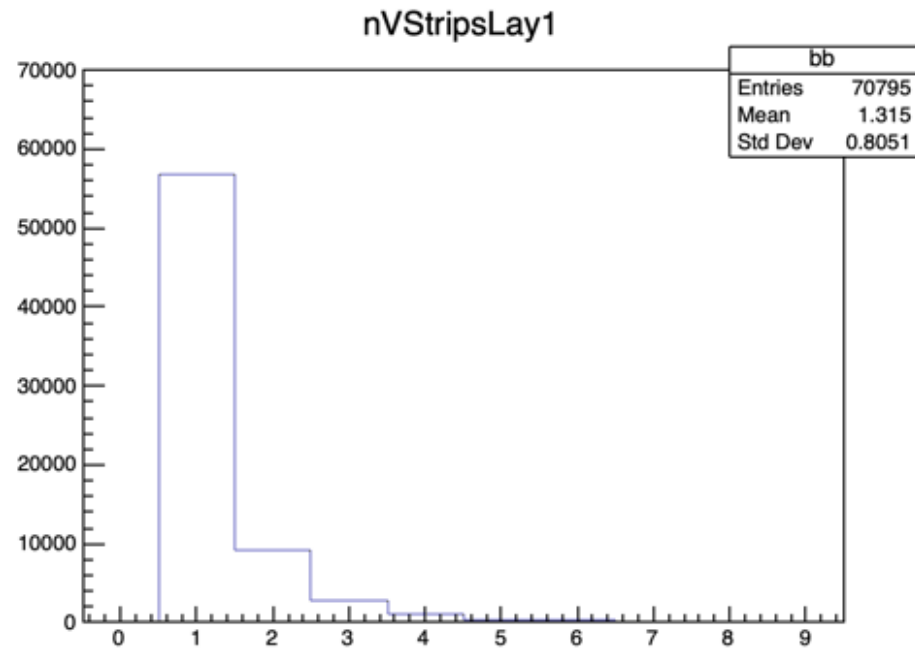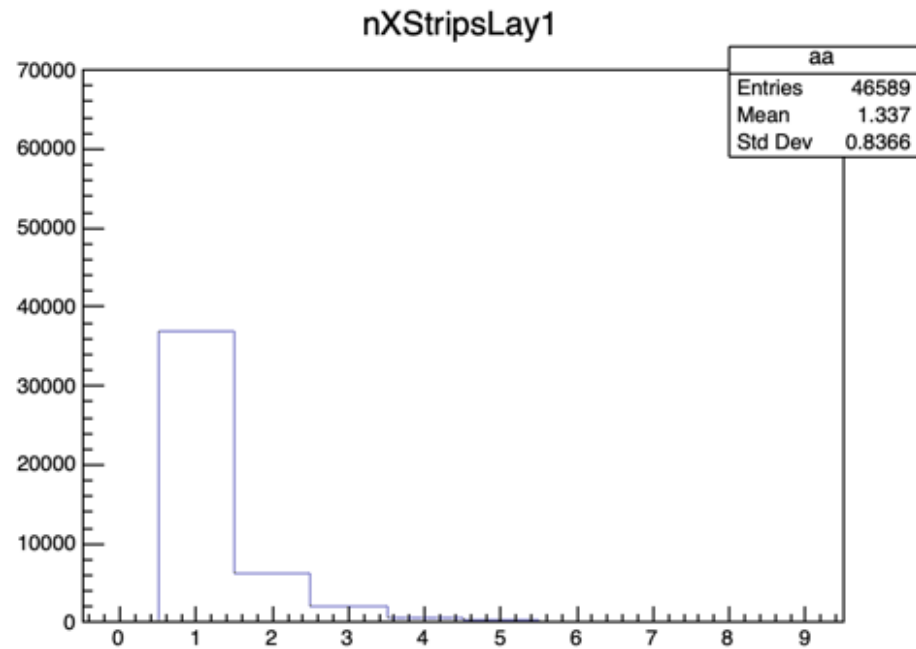
Check of charge sharing between different views

QXLay2/(QXLay2+QVLay2) {nXStripsLay2>1&&nVStripsLay2>1}

(size > 1)

L1

L2

RUN17

QX / (QX + QV)

QXLay2/(QXLay2+QVLay2) {nXStripsLay2>1&&nVStripsLay2>1}

(size > 1)

L1

L2

LOW GAIN

QX / (QX + QV)

QXLay2/(QVLay2+QXLay2) {QXLay2>0&&QVLay2>0}

cc
Entries   1128748
Mean   0.6537
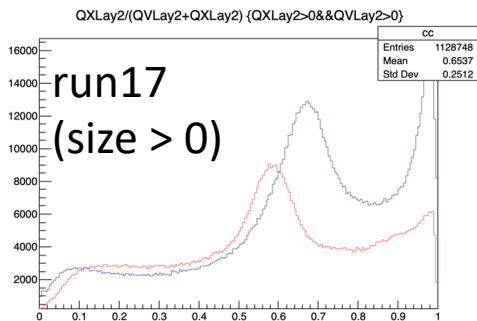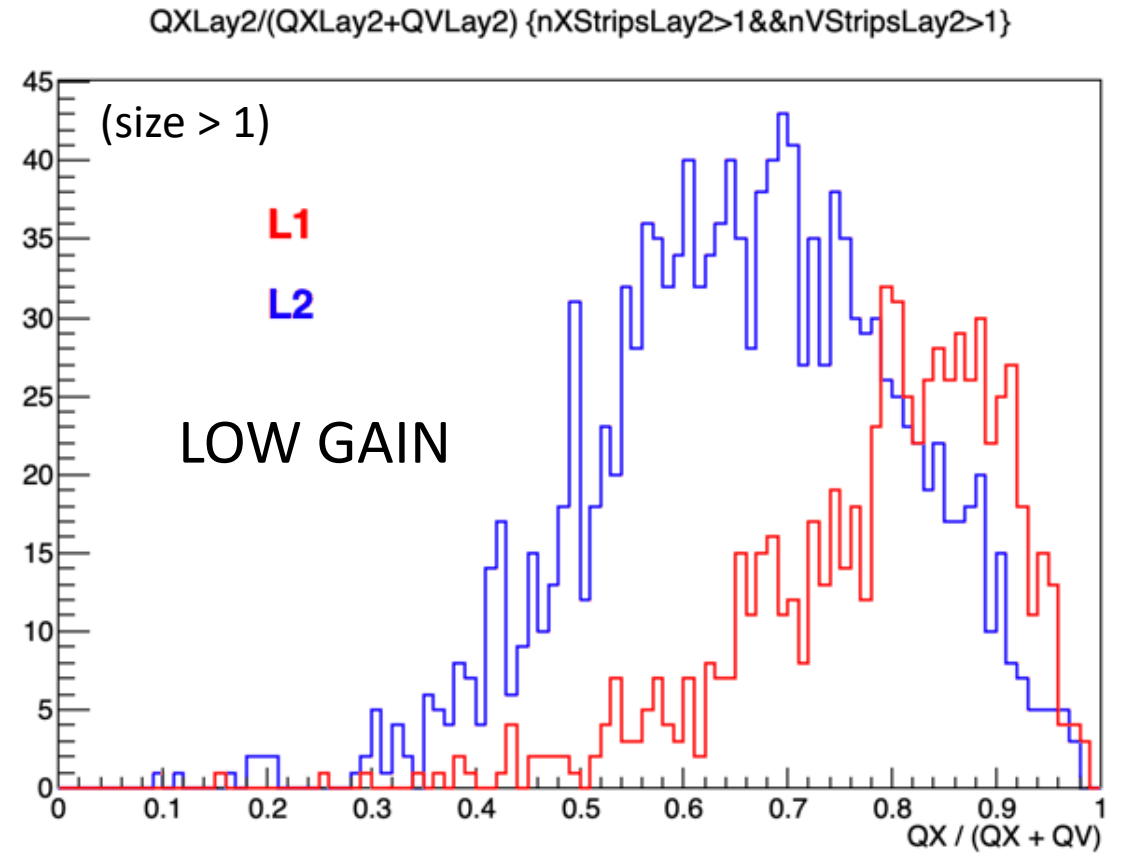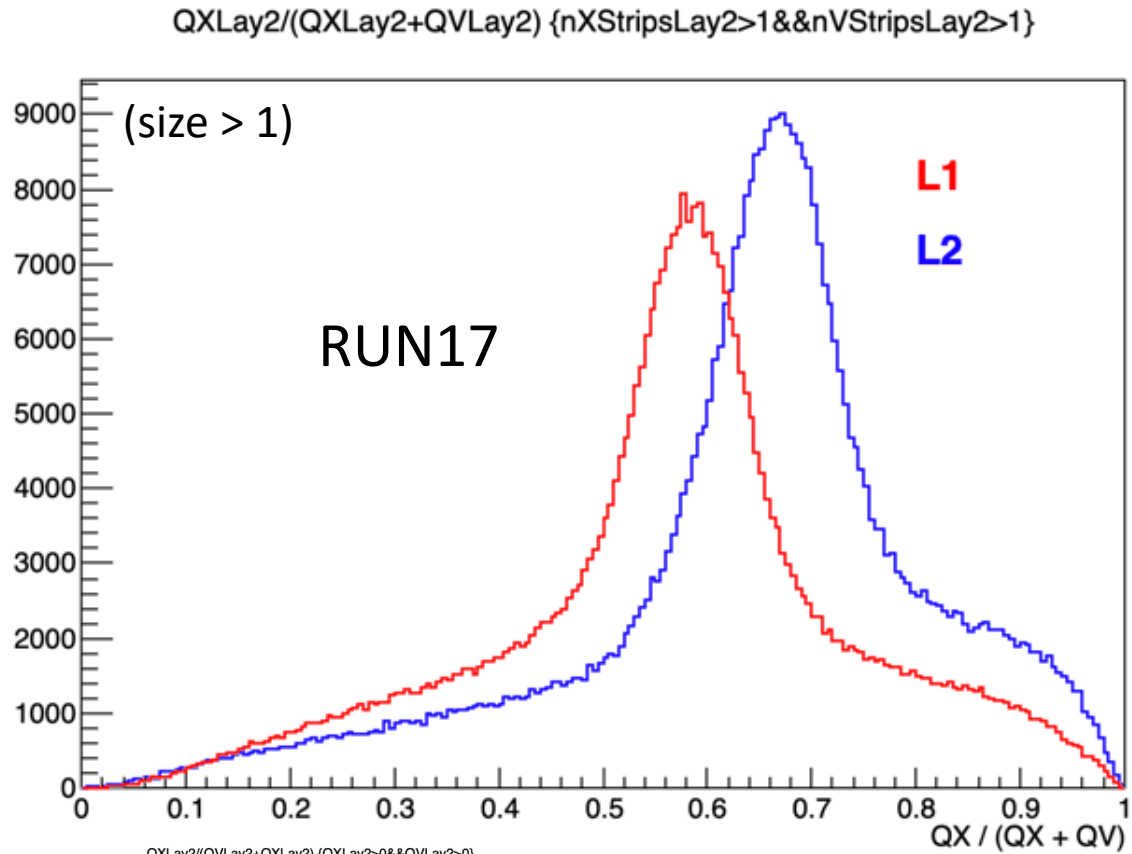Std Dev   0.2512

run17

(size > 0)

A way to clean noise clusters?

Cluster charge
Vs
Strip multiplicity