Power Pulsing studies with M26 for the PLUME project

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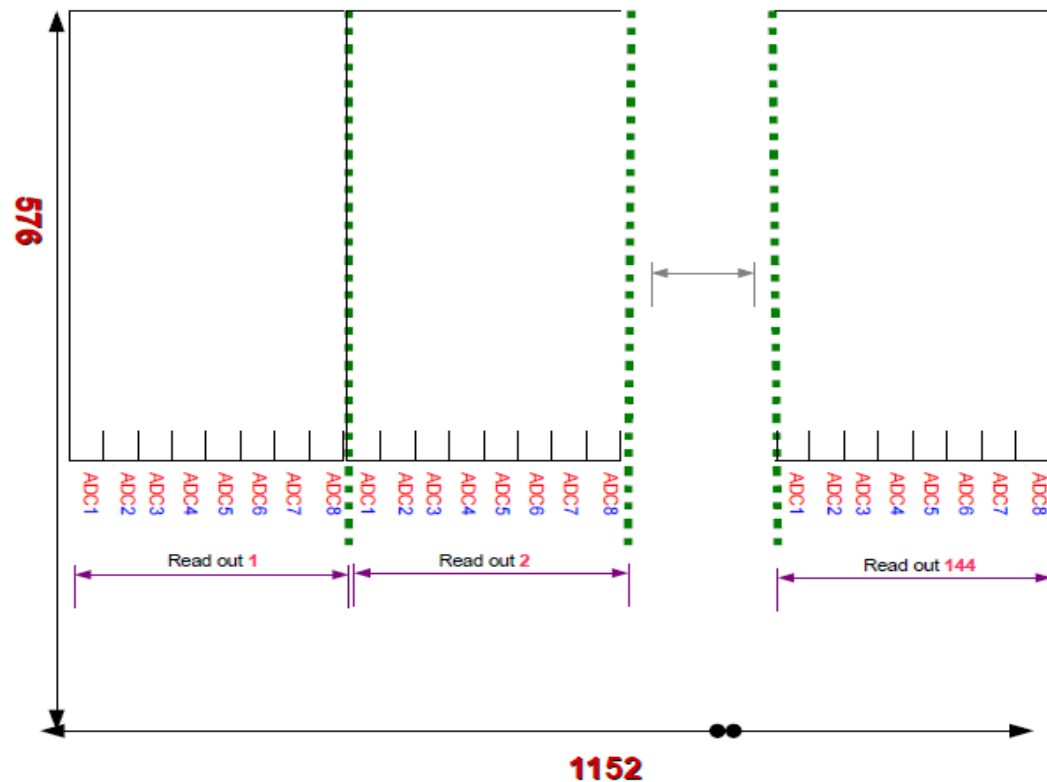PLUME phone meeting. October 27, 2010

Outline

- Fe55 data in the SCAN mode

- Laser data in the SCAN mode

- Analog Power Pulsing

  - Pedestals in the PP mode

  - Noises in the PP mode

- Summary

To learn more about the motivations, possibilities to do PP and system set up, please, have a look on the presentation at PLUME meeting **CERN, Geneva, 18 June, 2010 "Power Pulsing studies"**

Fe55 data. SCAN mode

- There is a possibility to read out full chip with analog read out

- We tried to understand our data with a scan mode before we switch to the laser data.

- We are not able yet to put the light spot into the edge of the sensor

MIMOSA 26 *Analogue read out.* SCAN mode

576

ADC1 ADC2 ADC3 ADC4 ADC5 ADC6 ADC7 ADC8 ADC1 ADC2 ADC3 ADC4 ADC5 ADC6 ADC7 ADC8 ADC1 ADC2 ADC3 ADC4 ADC5 ADC6 ADC7 ADC8

Read out 1   Read out 2   Read out 144

1152

We go though the sensor with a step of 8 pixels=8 ADC

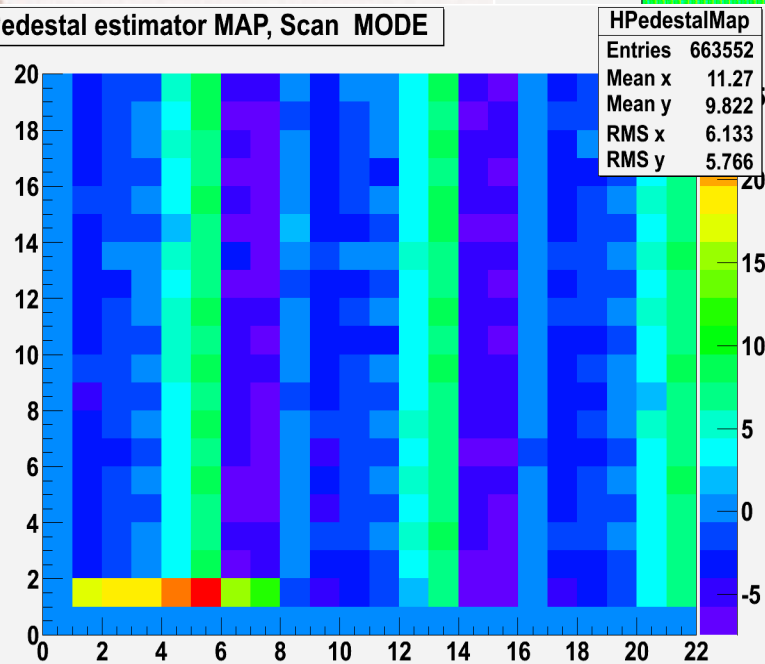On the last 8th ADC we had a time information instead of the data.

Fe55 data. SCAN mode

A barred substructure is only an optical effect due to the time signal on the each 8th ADC
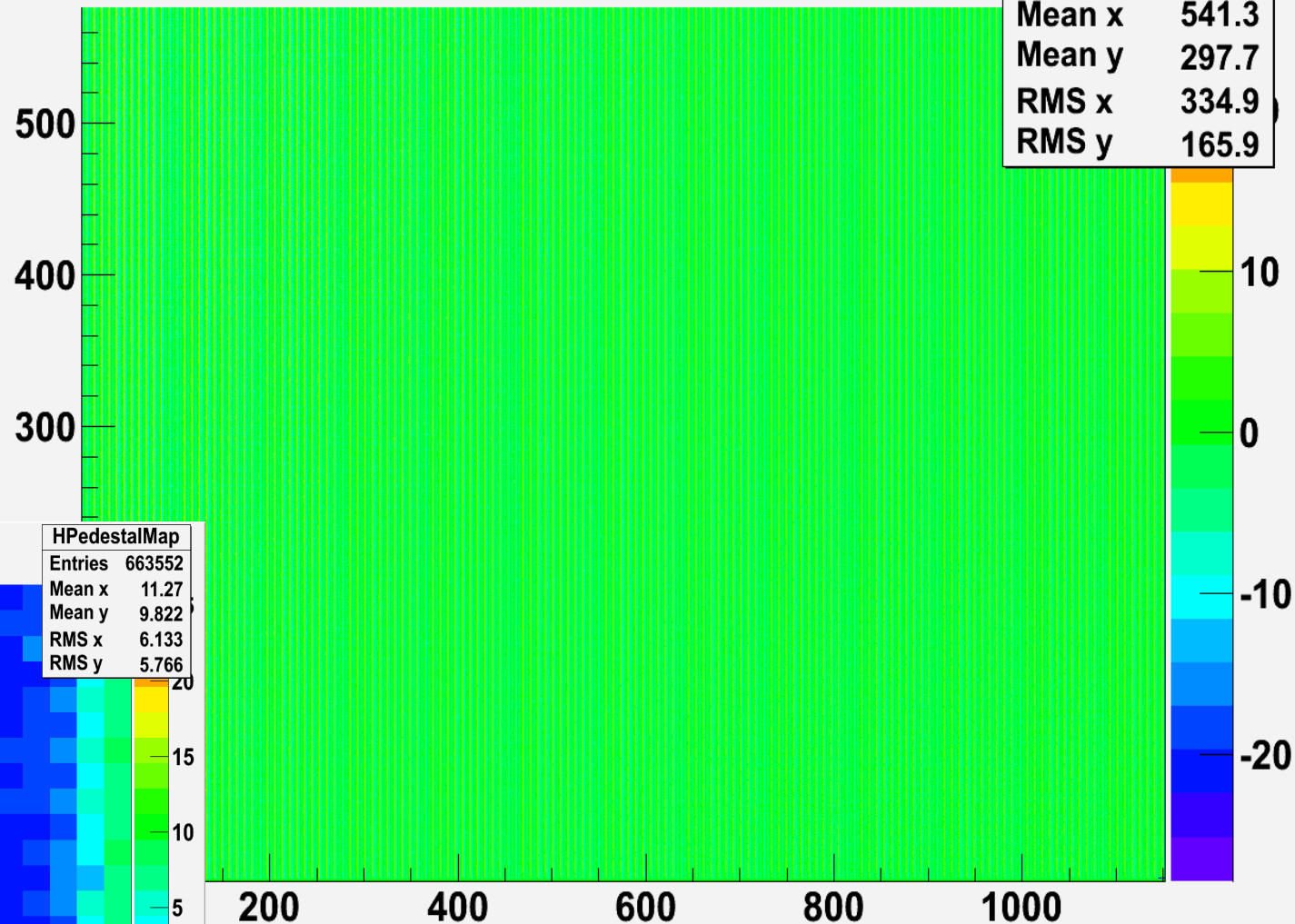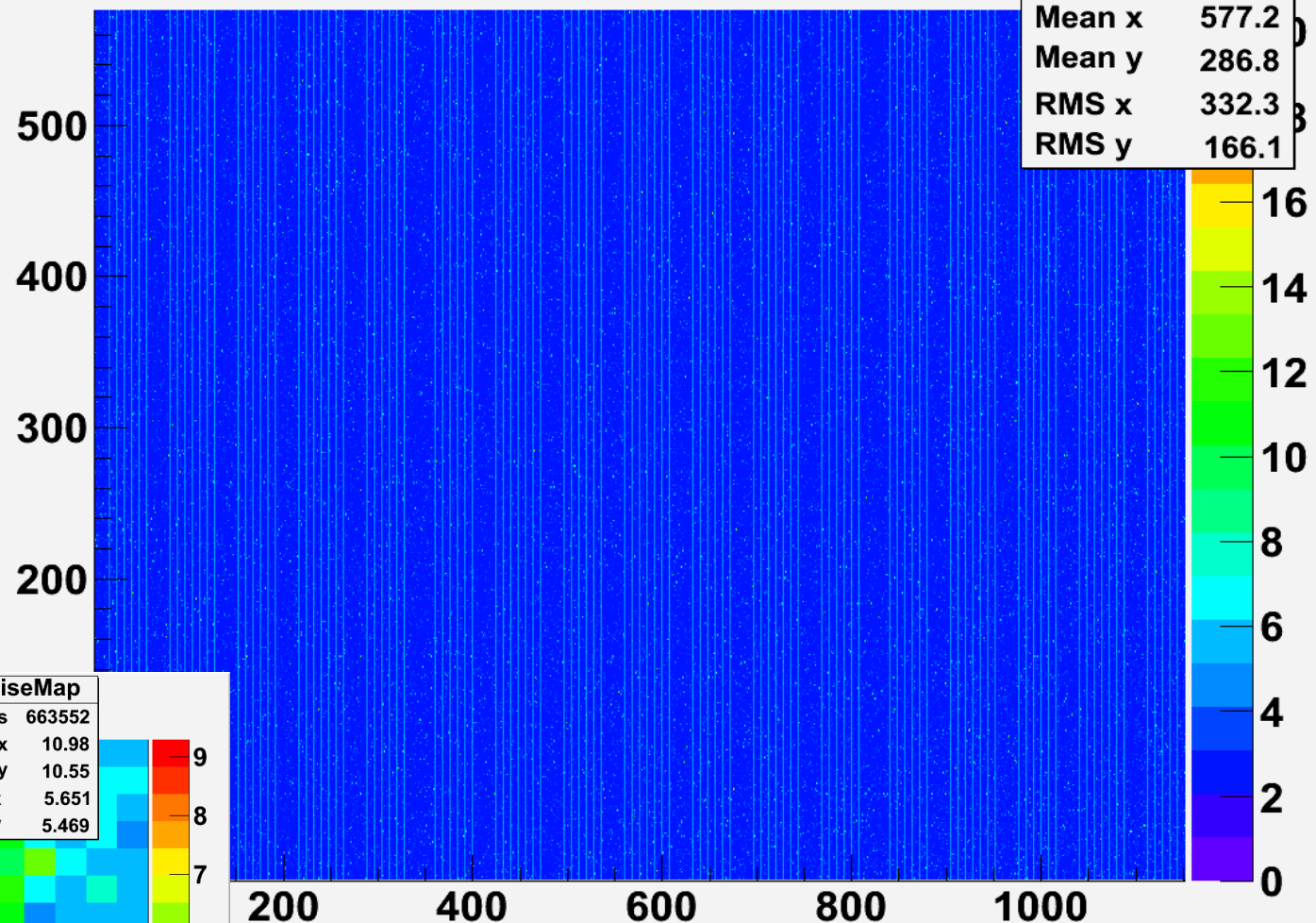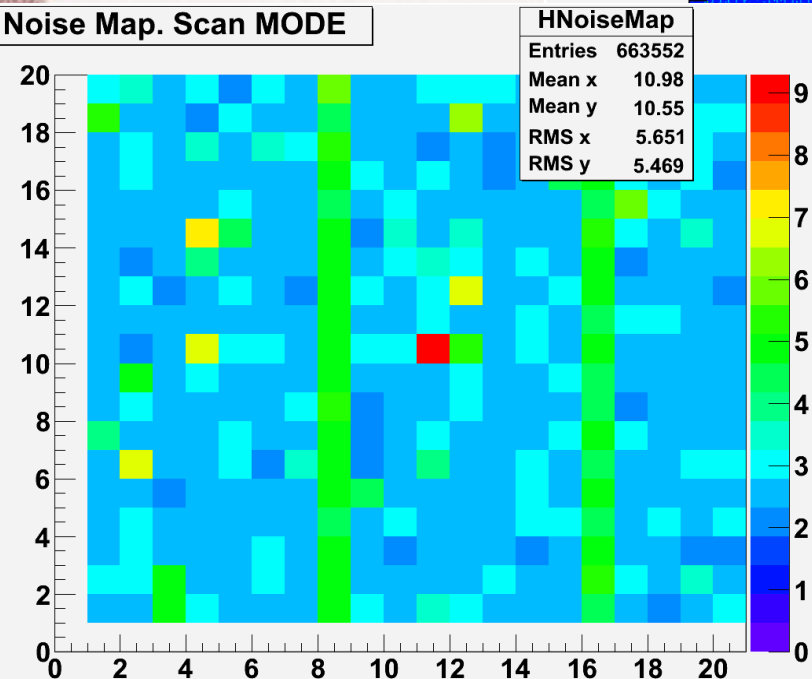

- *Pedestal* : a mean value of CDS in each pixel for the Noise events
- *Noise* : a standard deviation of the pedestal
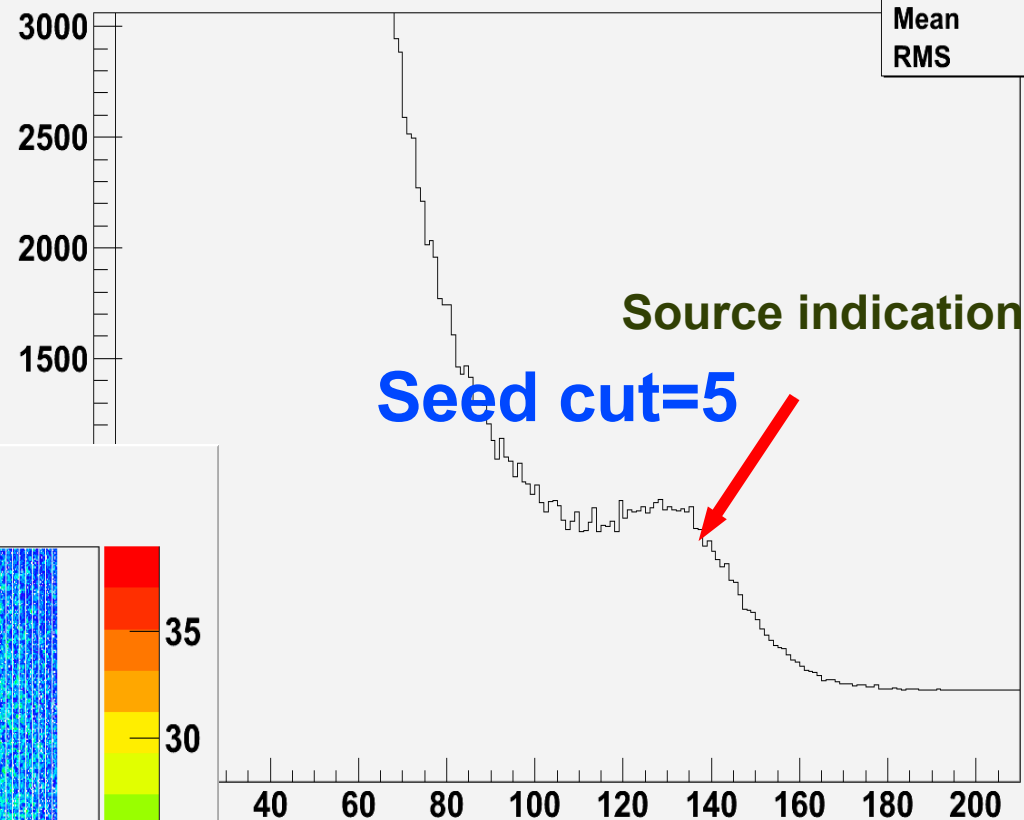
Fe55 data. SCAN mode

Noise Map. Scan MODE

HNoiseMap	
Entries	663552
Mean x	577.2
Mean y	286.8
RMS x	332.3
RMS y	166.1

Noise Map. Scan MODE

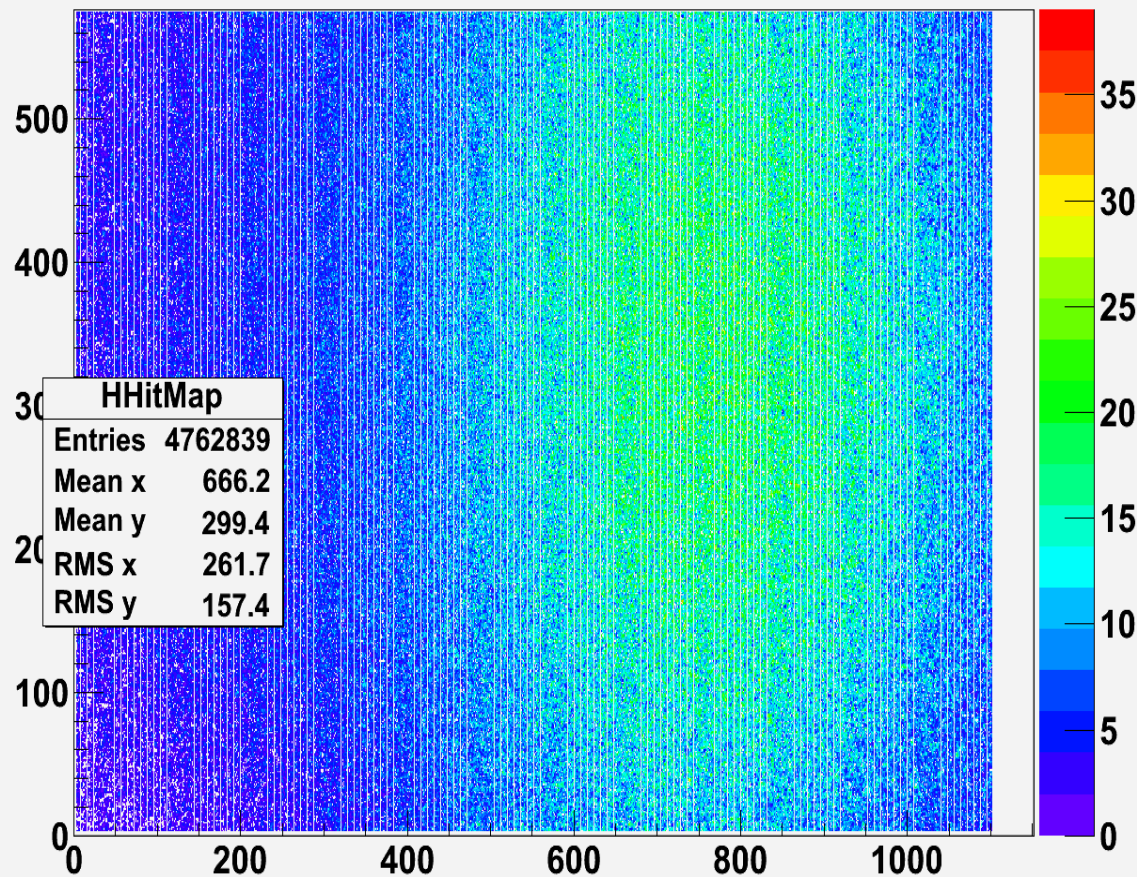| HNoiseMap	
Entries	663552
Mean x	10.98
Mean y	10.55
RMS x	5.651
RMS y	5.469

The Noise distribution is almost homogeneous through the sensor

Fe55 data. SCAN mode

Potential seeds signal-to-noise distribution

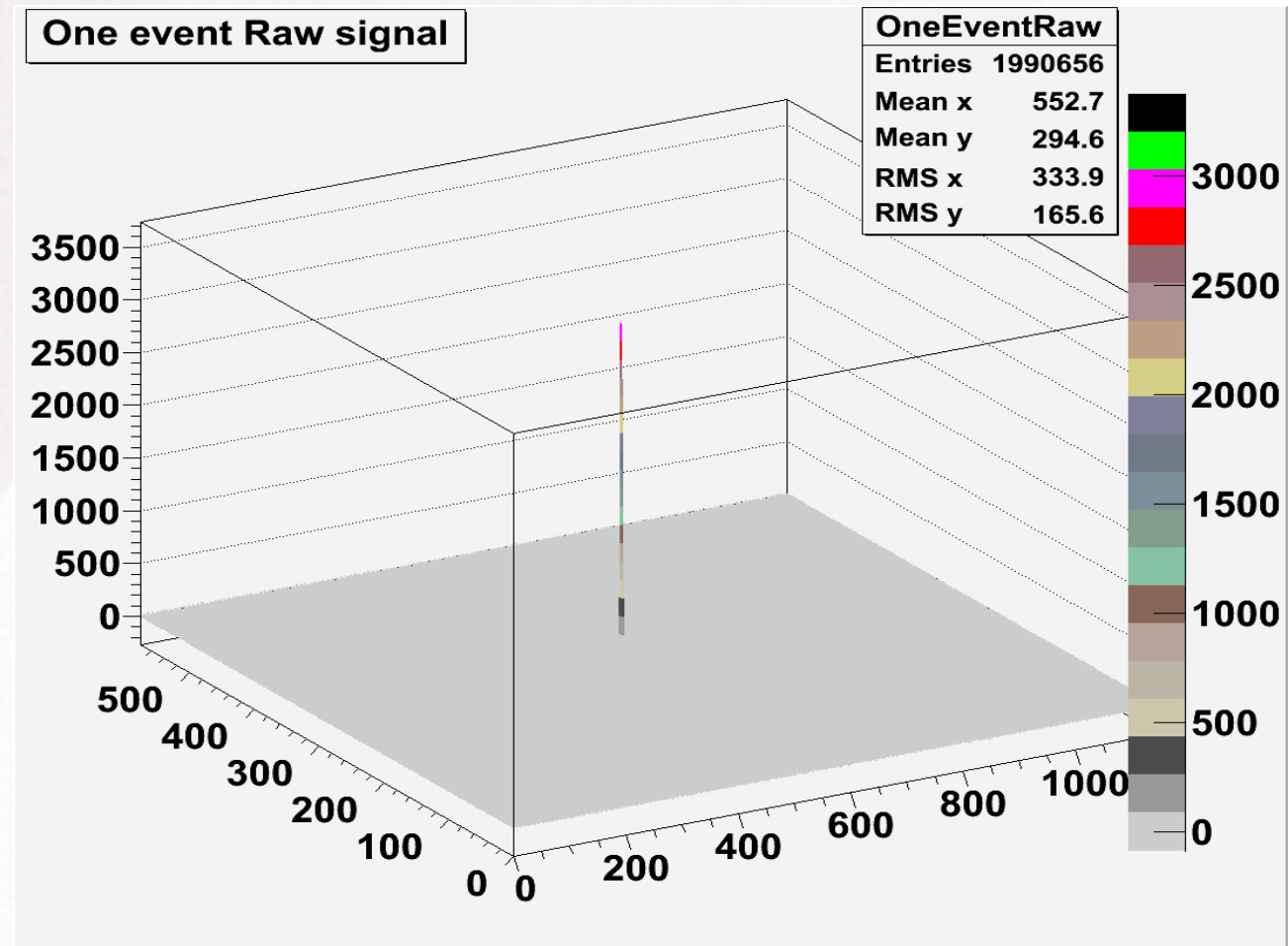| HSignalToNoise	
Entries	4762839
Mean	19.55
RMS	16.79

Source indication

Seed cut=5

Hit map for all events

HHitMap	
Entries	4762839
Mean x	666.2
Mean y	299.4
RMS x	261.7
RMS y	157.4

**Laser data.
SCAN mode**

- **Sensor M26, 50mk thick.**
- **Infrared laser, 904 nm**

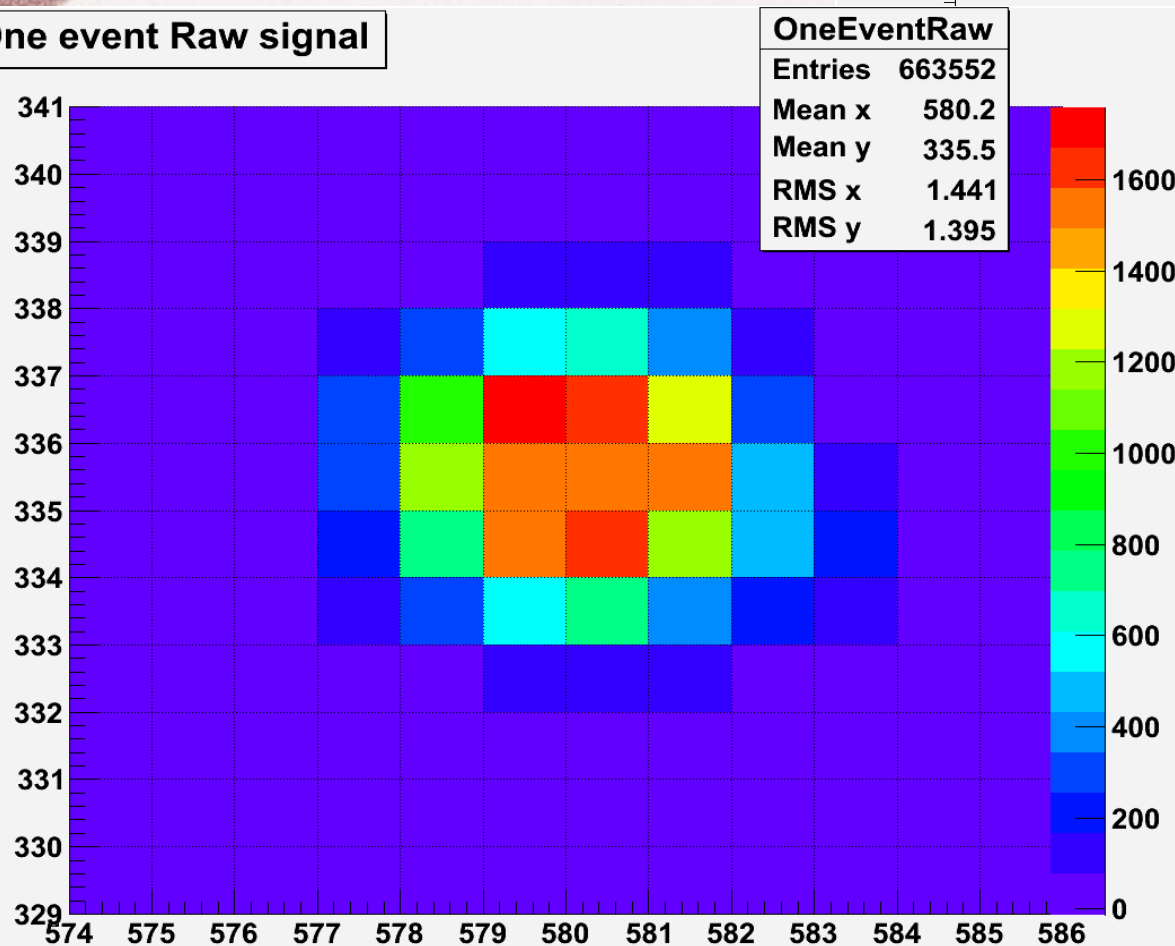**Laser light can be used as MIP, so one does not need to go to the test beam :)**

One event Raw signal

OneEventRaw	
Entries	1990656
Mean x	552.7
Mean y	294.6
RMS x	333.9
RMS y	165.6

CDS from 1 event

Laser data. SCAN mode

One event 402 Raw signal. LAser run 267004

OneEventRaw	
Entries	663552
Mean x	5
Mean y	2
RMS x	3
RMS y	

One event Raw signal

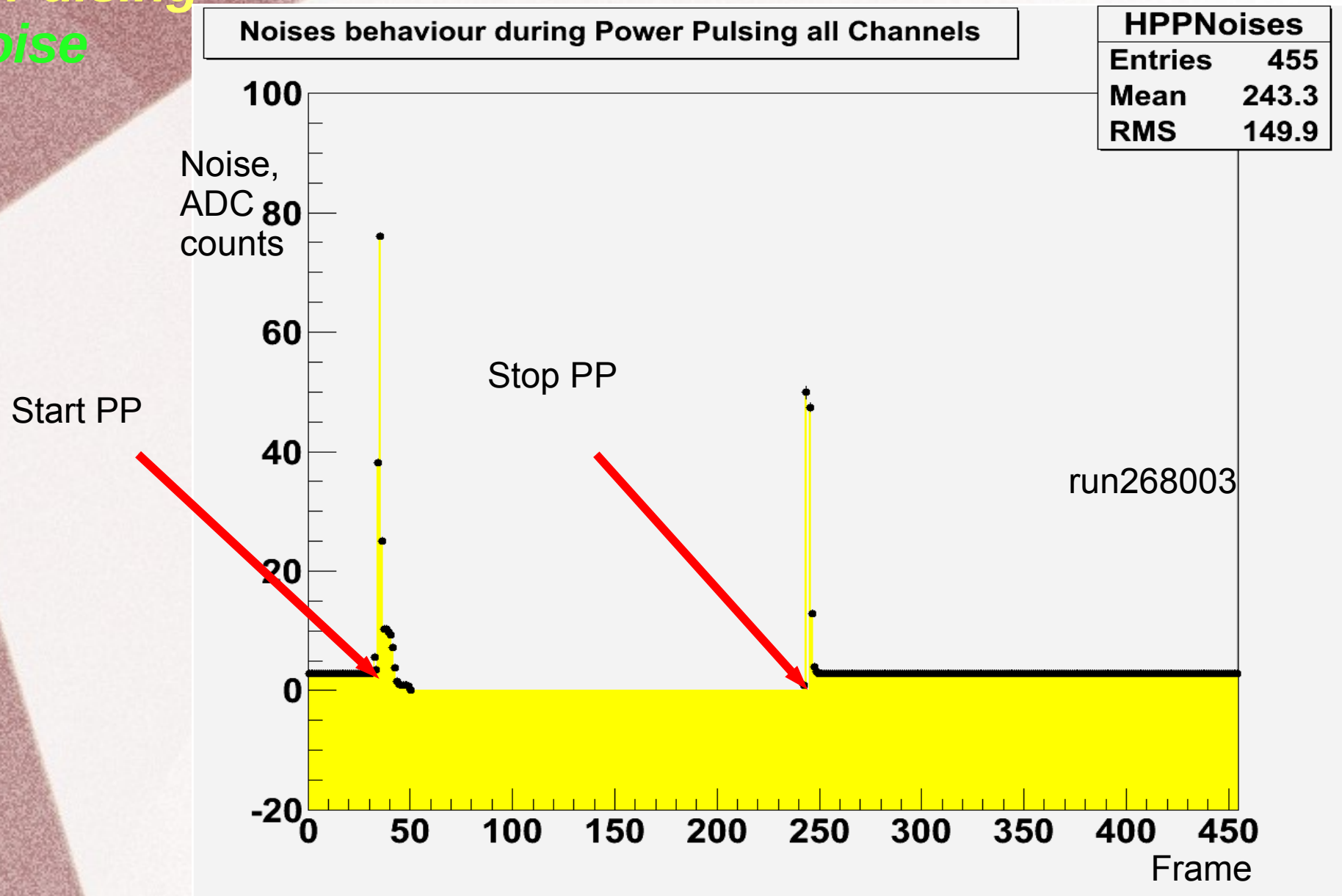| OneEventRaw	
Entries	663552
Mean x	580.2
Mean y	335.5
RMS x	1.441
RMS y	1.395
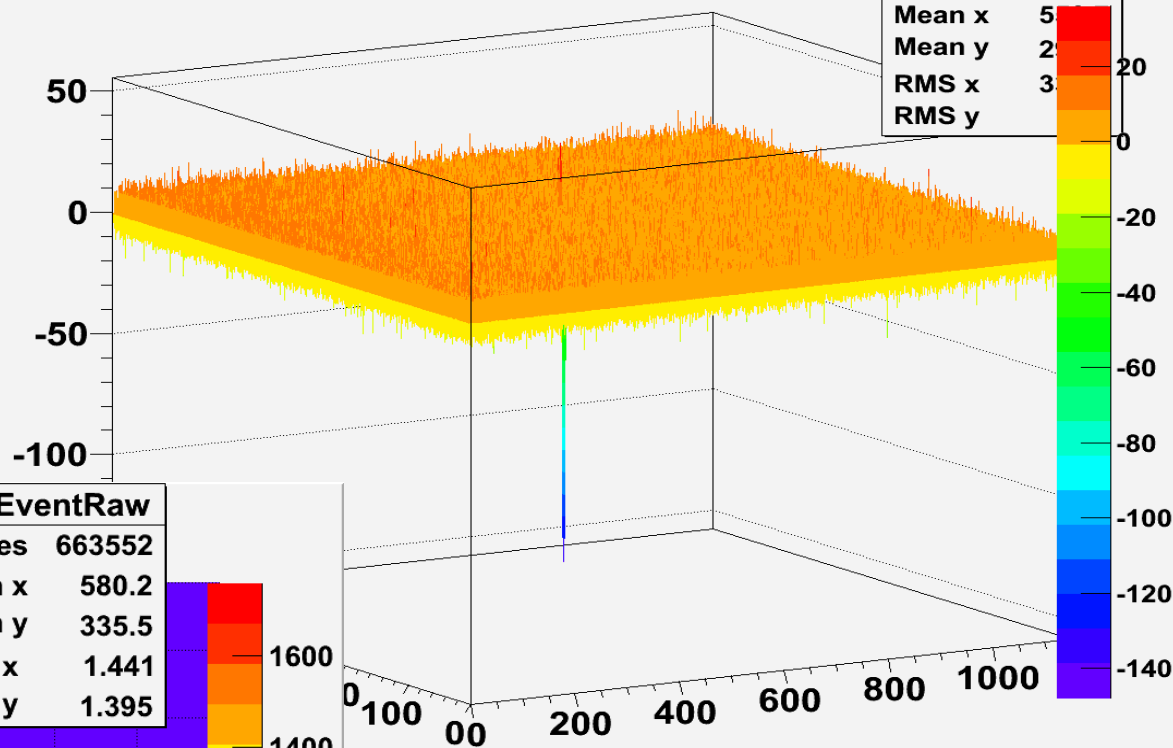
We are not quite sure about the our understanding of the laser injection. Sometimes signal goes negative and for some events we do not see any sign of a signal

Analogue Power Pulsing Noise

100 ms Power Pulsing duration

Noises behaviour during Power Pulsing all Channels

HPPNoises	
Entries	455
Mean	243.3
RMS	149.9

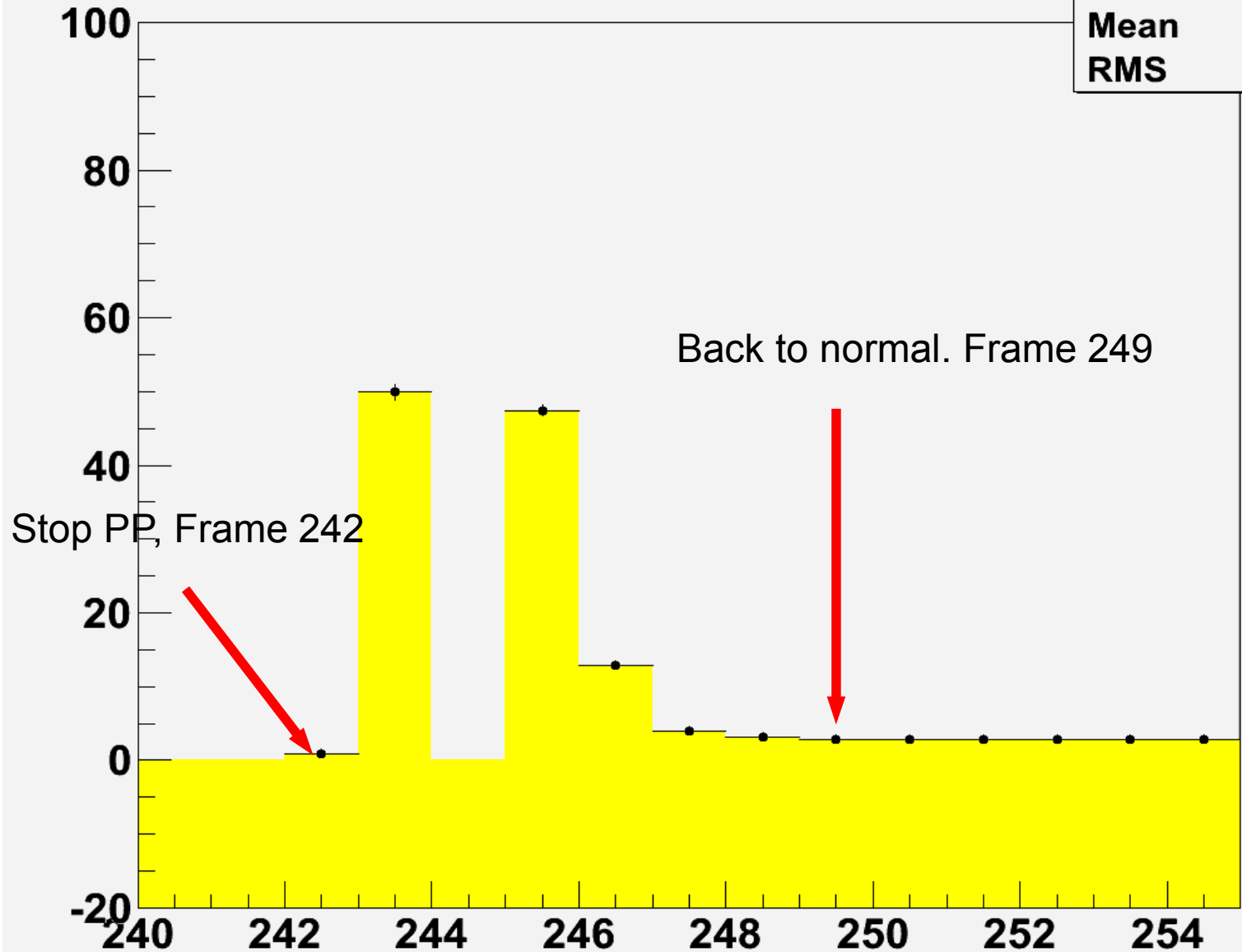Noise, ADC counts

Start PP

Stop PP

run268003

Frame

We do analogue PP with the special module given by Strasbourg

Analogue Power Pulsing Noise

Noises behaviour during Power Pulsing all Channels

HPPNoises
Entries 455
Mean 245.8
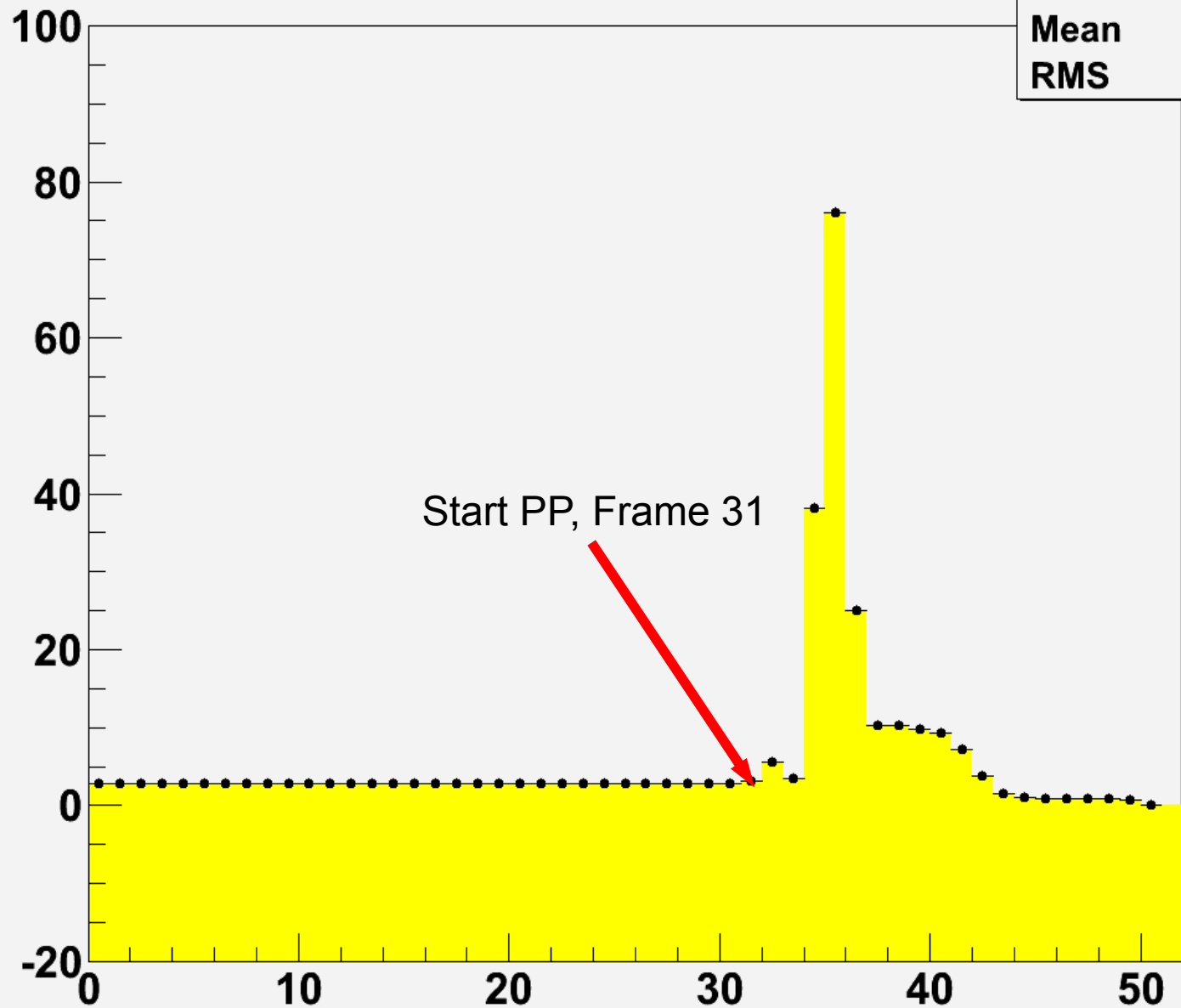RMS 2.751

Stop PP, Frame 242

Back to normal. Frame 249

Analogue Power Pulsing Noise

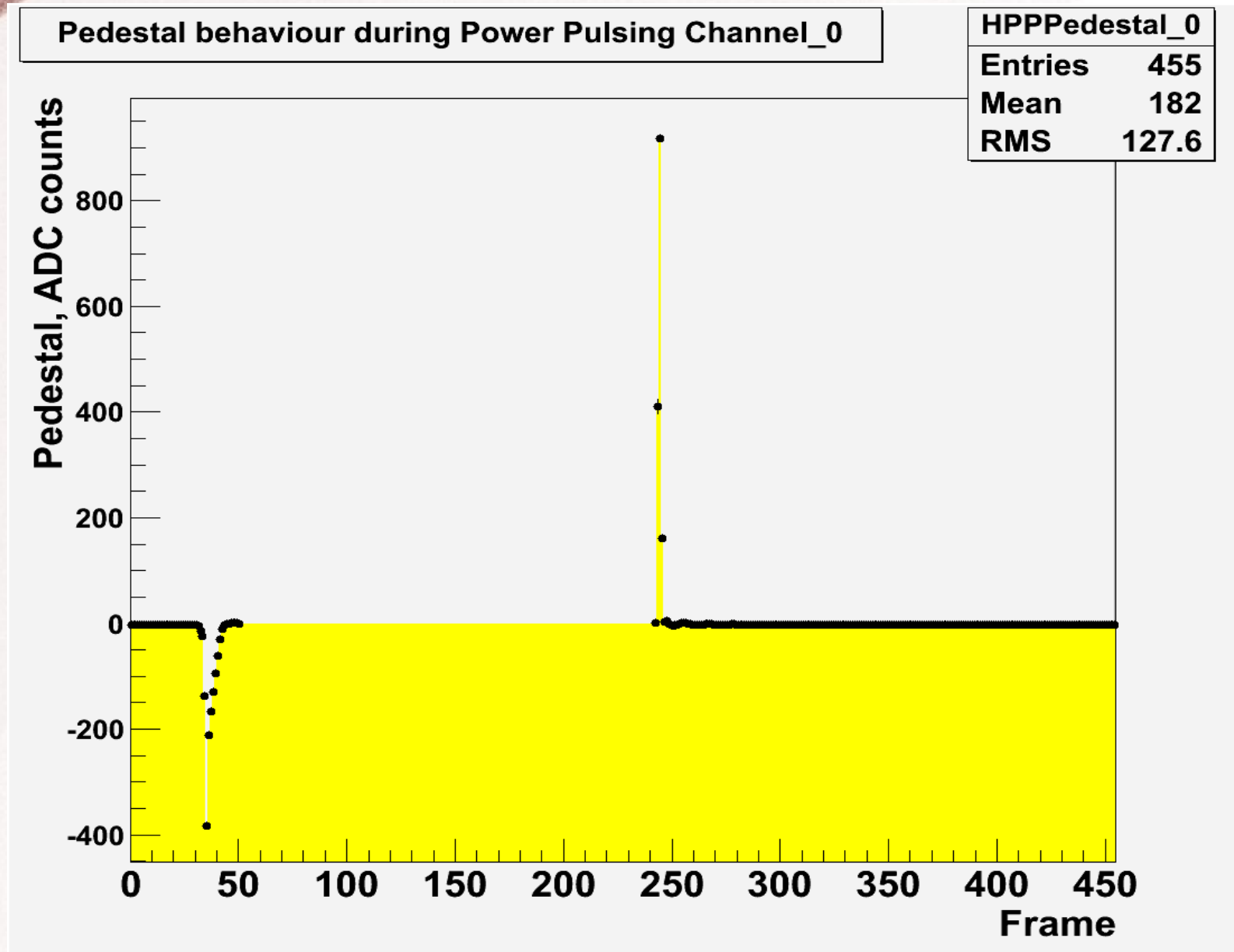Noises behaviour during Power Pulsing all Channels

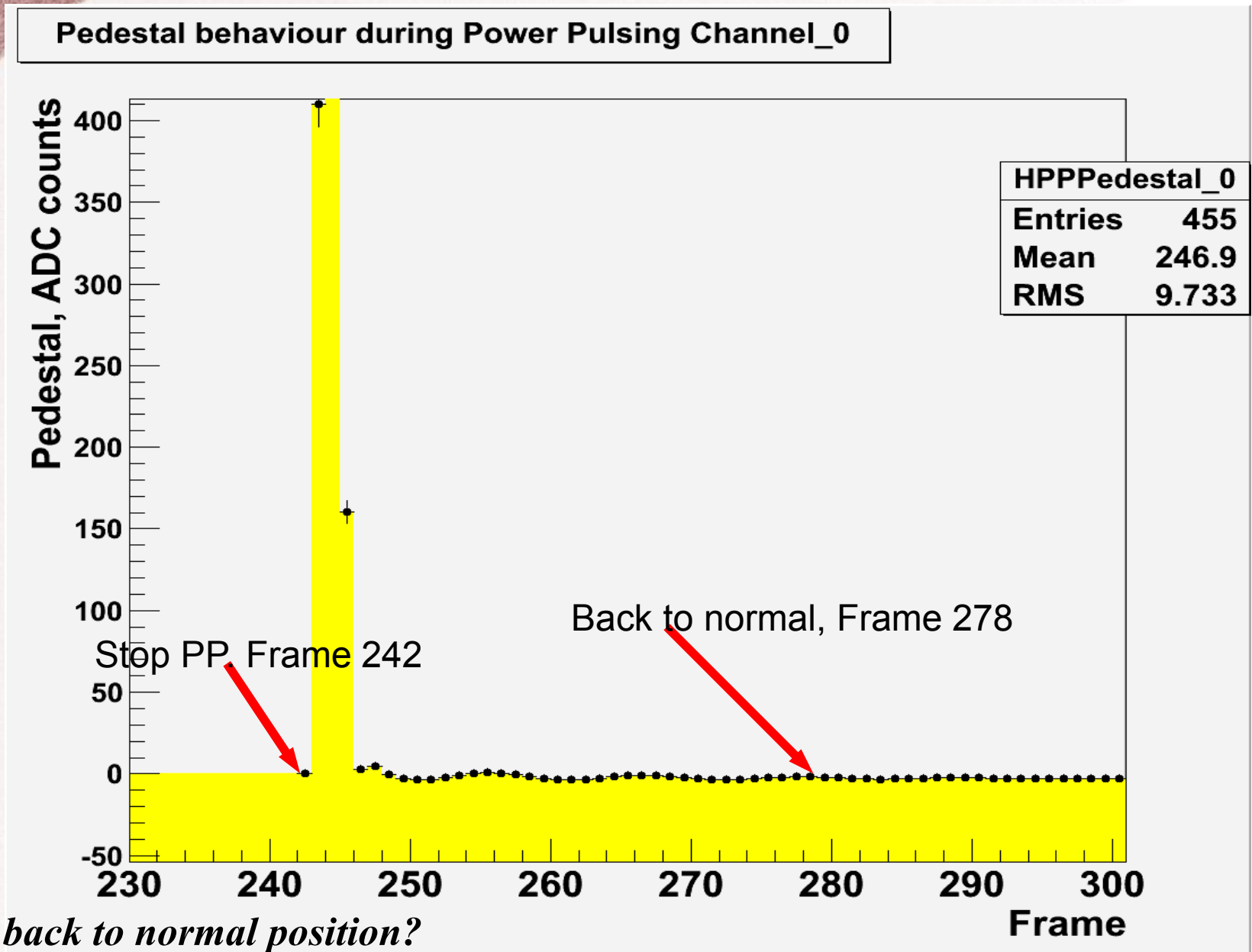| HPPNoises	
Entries	455
Mean	30.45
RMS	11.02

Start PP, Frame 31

Analogue Power Pulsing Pedestal

Done ADC by ADC as far as offset is different in the each of them

Analogue Power Pulsing Pedestal

All other channels ADC1-6 show up the same behavior during PP ~35-36 Frames to went back to the nominal offsets

Pedestal behaviour during Power Pulsing Channel_0

HPPPedestal_0	
Entries	455
Mean	246.9
RMS	9.733

Back to normal, Frame 278

Stop PP, Frame 242

How to define a back to normal position?

Summary

- We founded out how pedestals and noises behave themselves in the PP mode

- We need to investigate how the signal changes in the PP mode.

- Data with a laser light were taken and need further understanding