

# HFT software Meeting

**Babak Abi**

**03/12/14**

# Dead Chip/Channels procedure

- Goal is to make Permanent dead Chip/Channels tables based on all run.
  - 209 Cosmic runs is used plots at :
  - [http://www4.rcf.bnl.gov/~babakabi/public\\_html/plots/index.htm](http://www4.rcf.bnl.gov/~babakabi/public_html/plots/index.htm)
    - I. Pedestal/noise per ladders (3<sup>rd</sup> Timebin)
    - II. Pedestal/Noise/ComModeNoise for All time bins .
    - III. Pedestal/Noise Stability for time bins 0 to 5 from Cosmic runs days 32 to 40

- General Characteristics of Silicon Strip Modules

1) Pedestal of Strip  $i$  from  $M$  events :

$$p_i = \frac{1}{M} \sum_{j=1}^M r_{ij} ,$$

2) Pedestal-noise of Strip  $i$  from  $M$  events

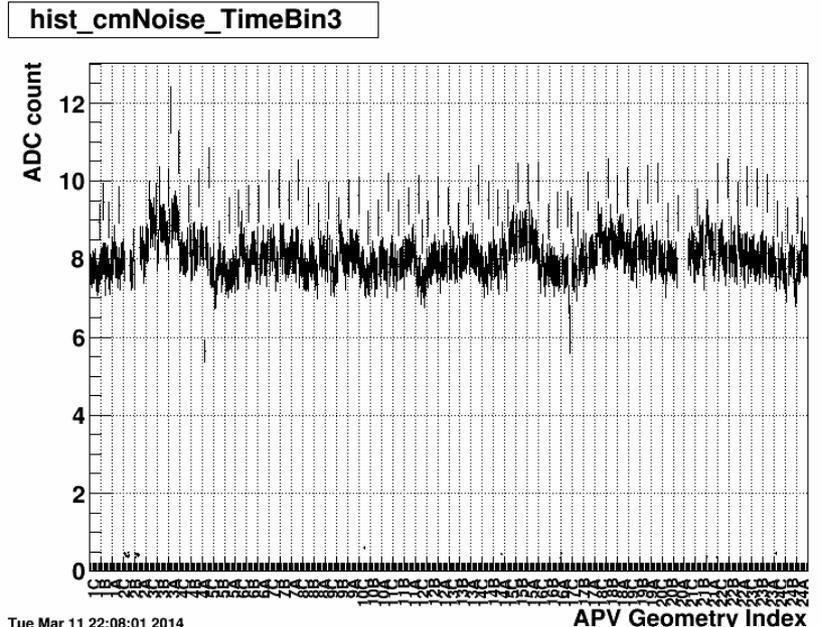
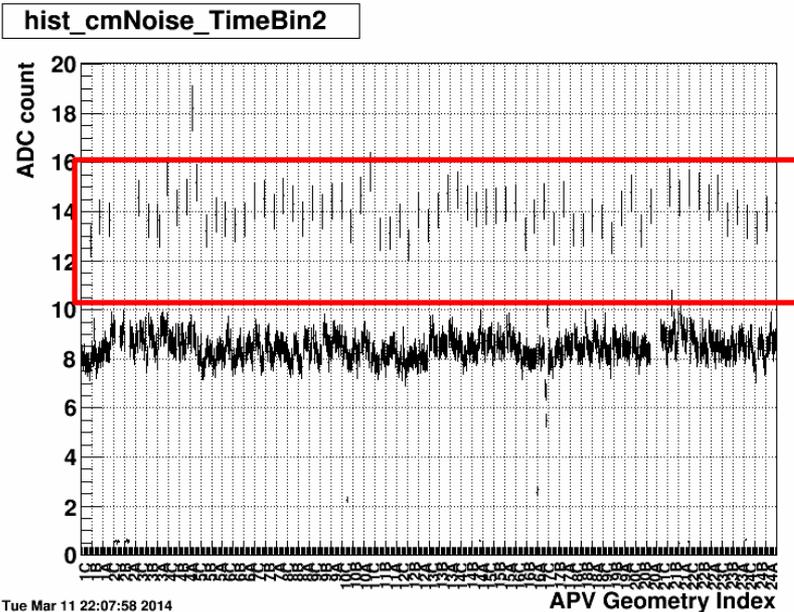
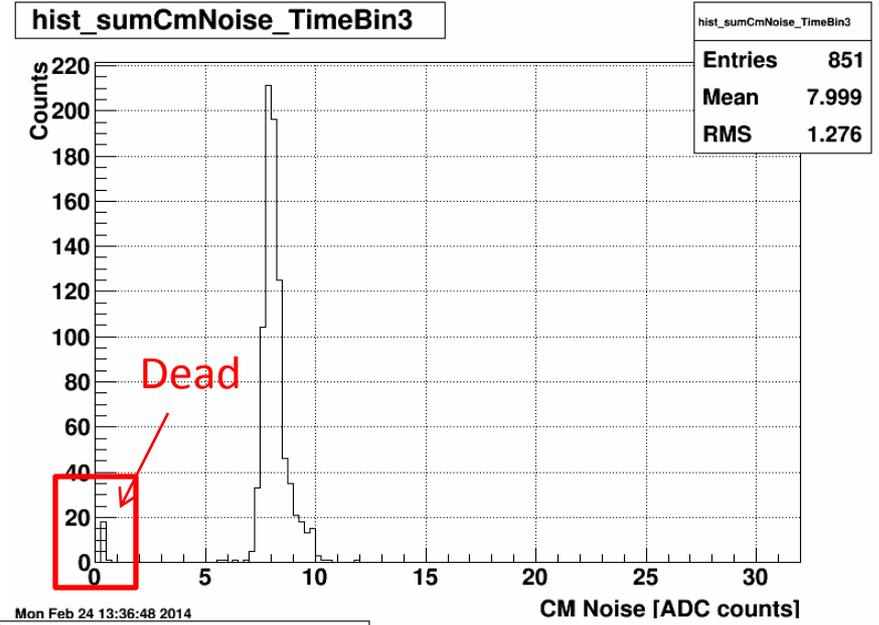
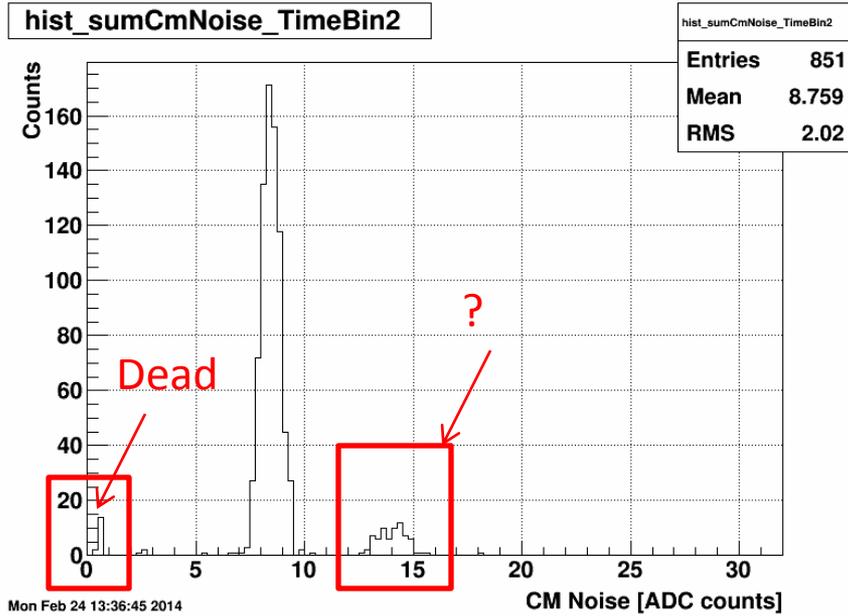
$$\sigma_i = RMS(r_{ij}) = \sqrt{\frac{1}{M} \sum_{j=1}^M (r_{ij} - p_i)^2}$$

3) Common mode offset (noise) of APV chip event  $j$ .

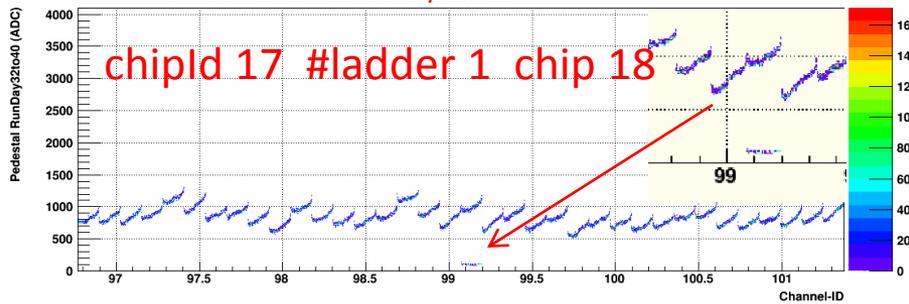
- The common mode noise is the RMS of the common mode distribution

$$CM_j = \frac{1}{128} \sum_{i=1}^{128} (r_{ij} - p_i)$$

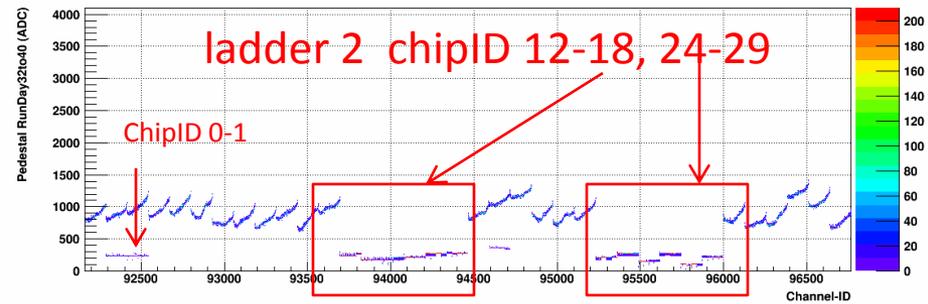
# Chips Common Mode noise



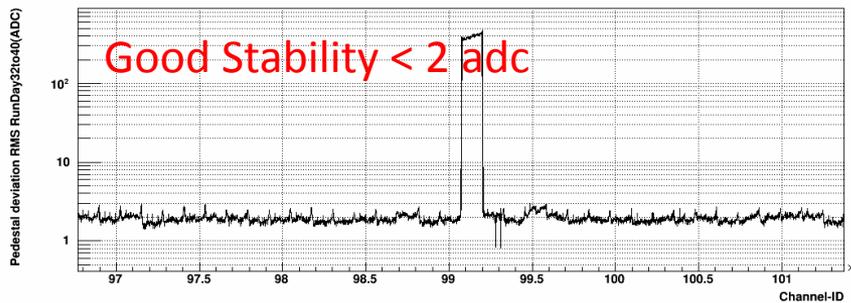
Ladder #1 Time-bin1 Pedestal distribution/allruns



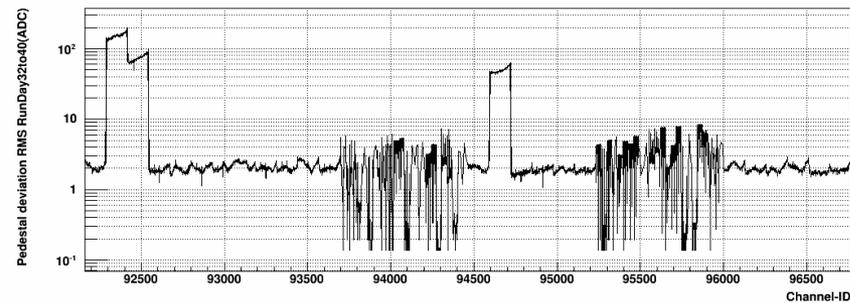
Ladder #2 Time-bin1



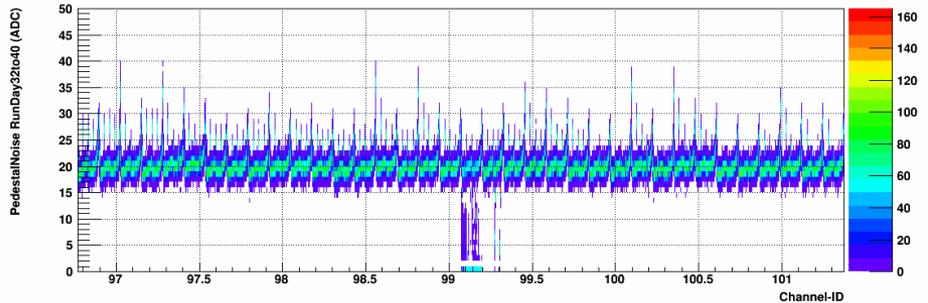
Ladder #1 Time-bin1 Pedestal deviation rms/allruns



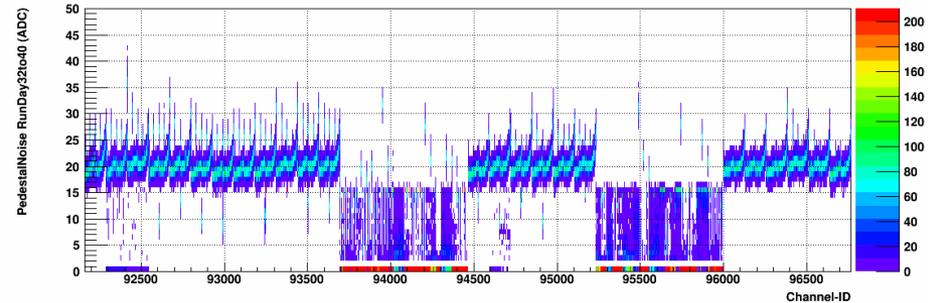
Ladder #2 Time-bin1



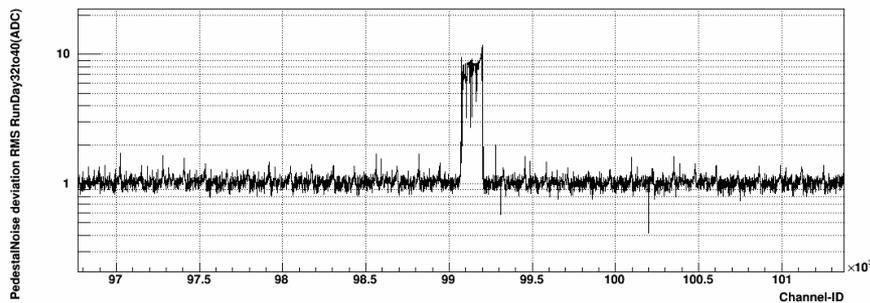
Ladder #1 Time-bin1 Pedestal -Noise distribution/allruns



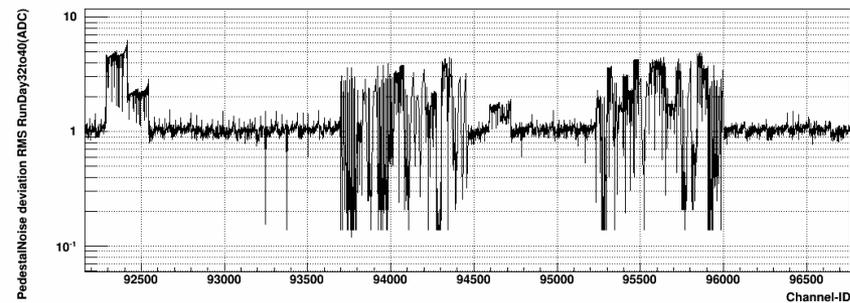
Ladder #2 Time-bin1



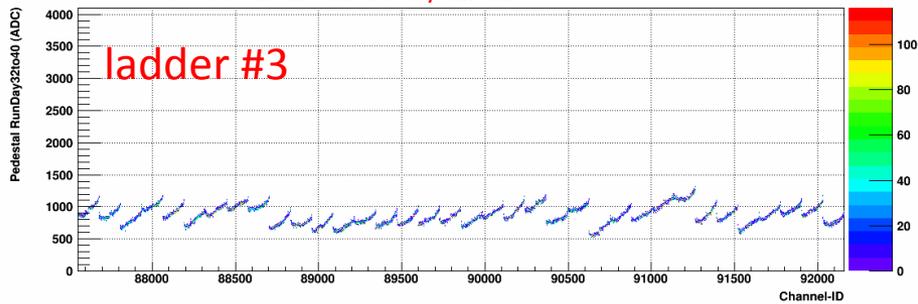
Ladder #1 Time-bin1 Pedestal -noise deviation rms/allruns



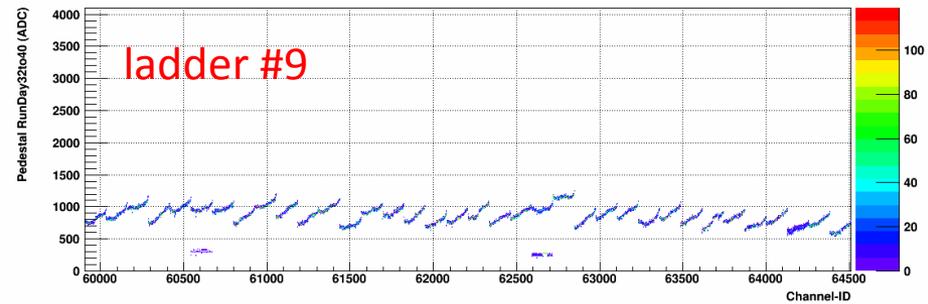
Ladder #2 Time-bin1



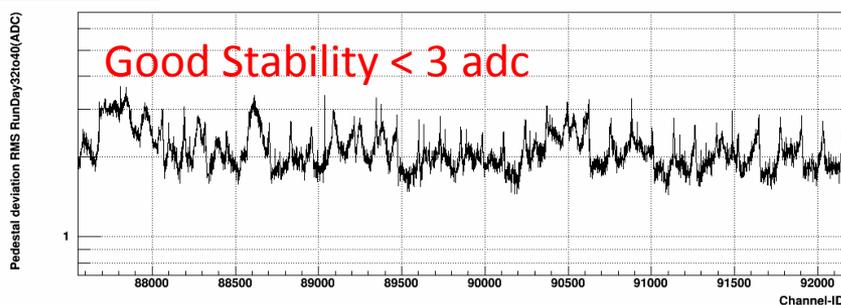
Ladder #3 Time-bin1 Pedestal distribution/allruns



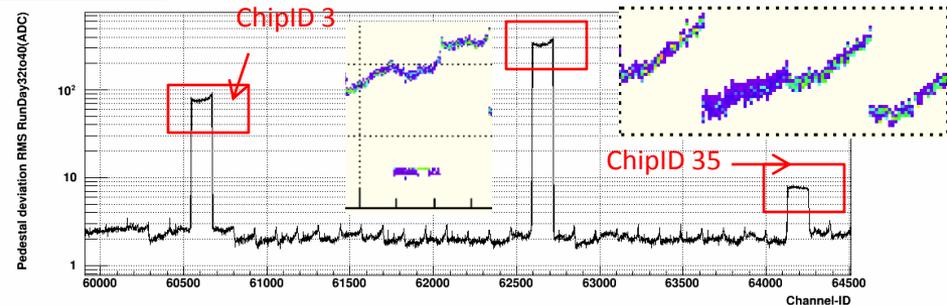
Ladder #9 Time-bin1



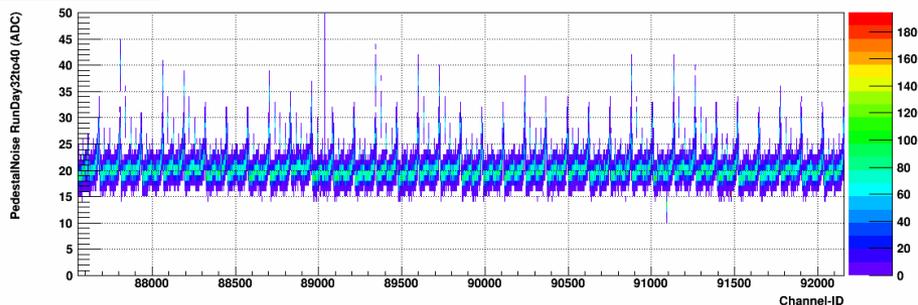
Ladder #3 Time-bin1 Pedestal deviation rms/allruns



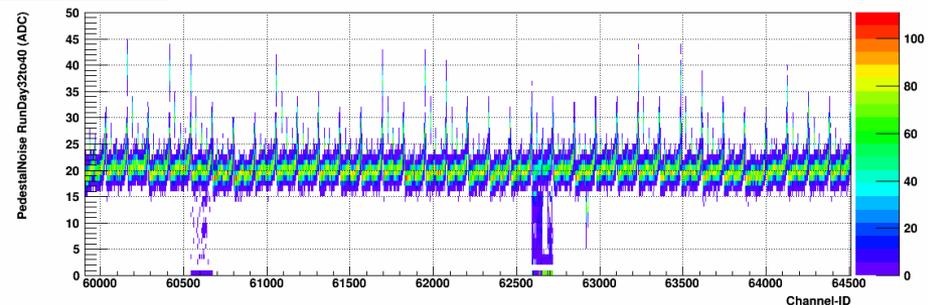
Ladder #9 Time-bin1



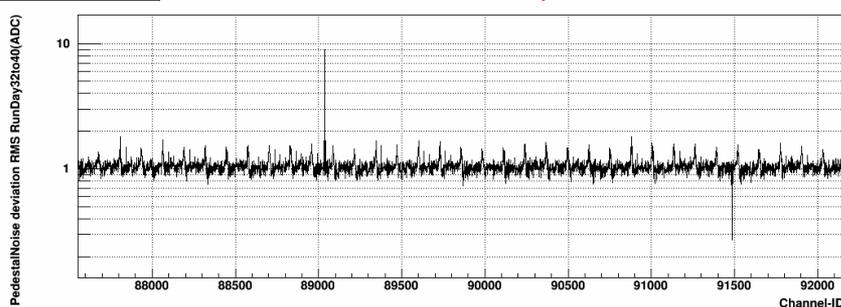
Ladder #3 Time-bin1 Pedestal -Noise distribution /allruns



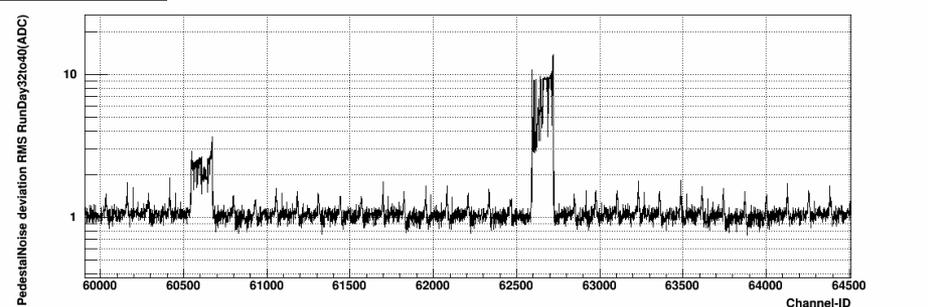
Ladder #9 Time-bin1



Ladder #3 Time-bin1 Pedestal -noise deviation rms/allruns



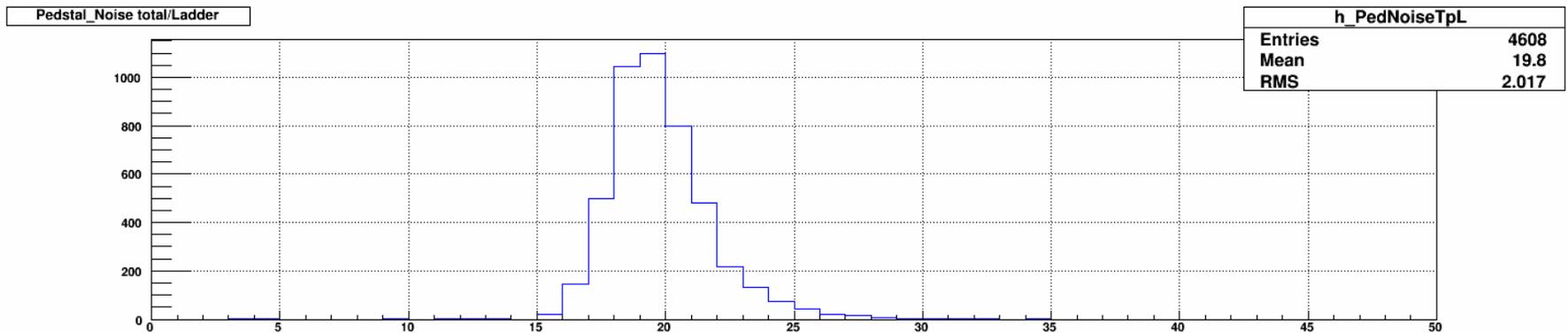
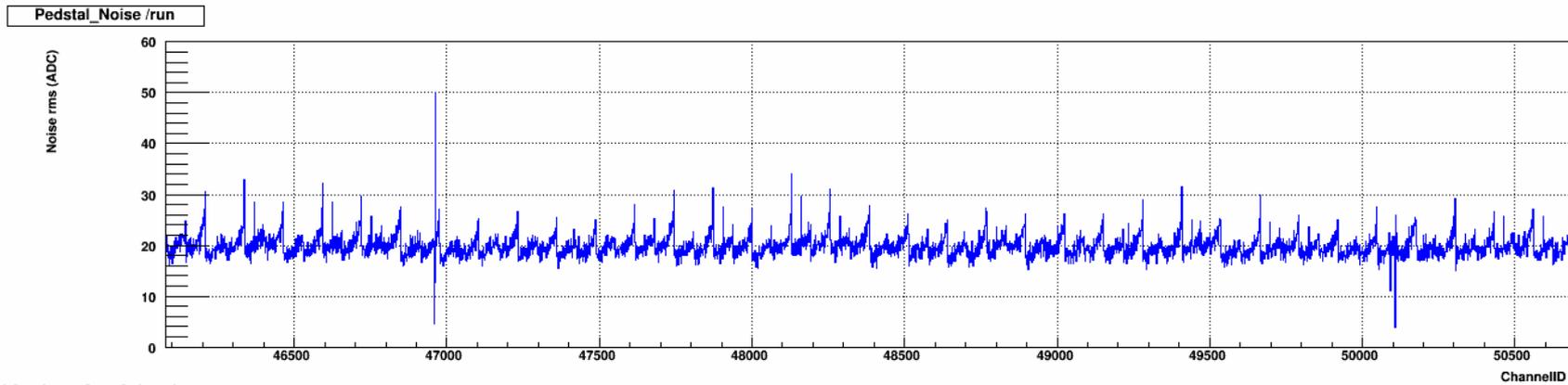
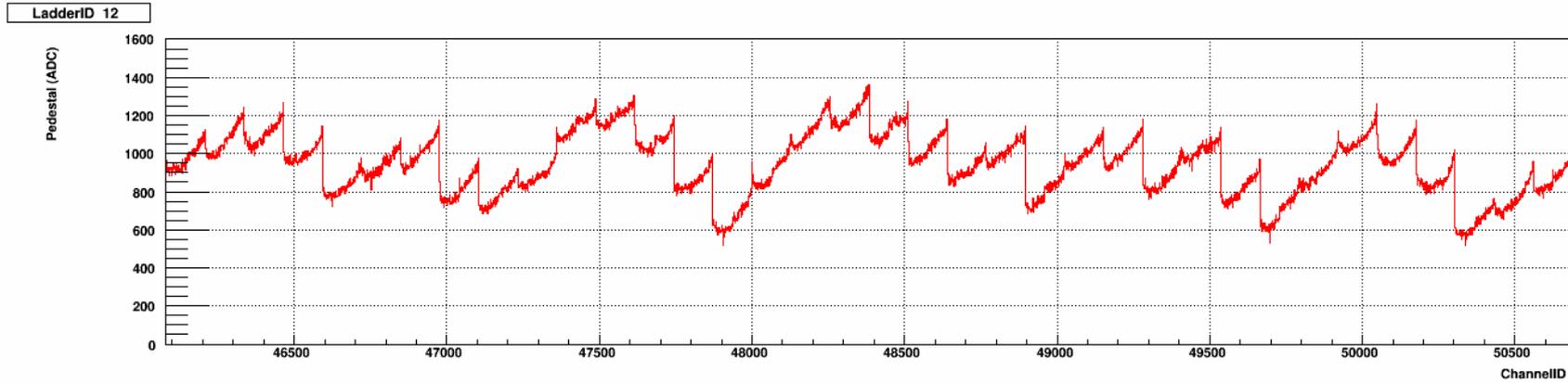
Ladder #9 Time-bin1



# Dead Chip/Channels procedure

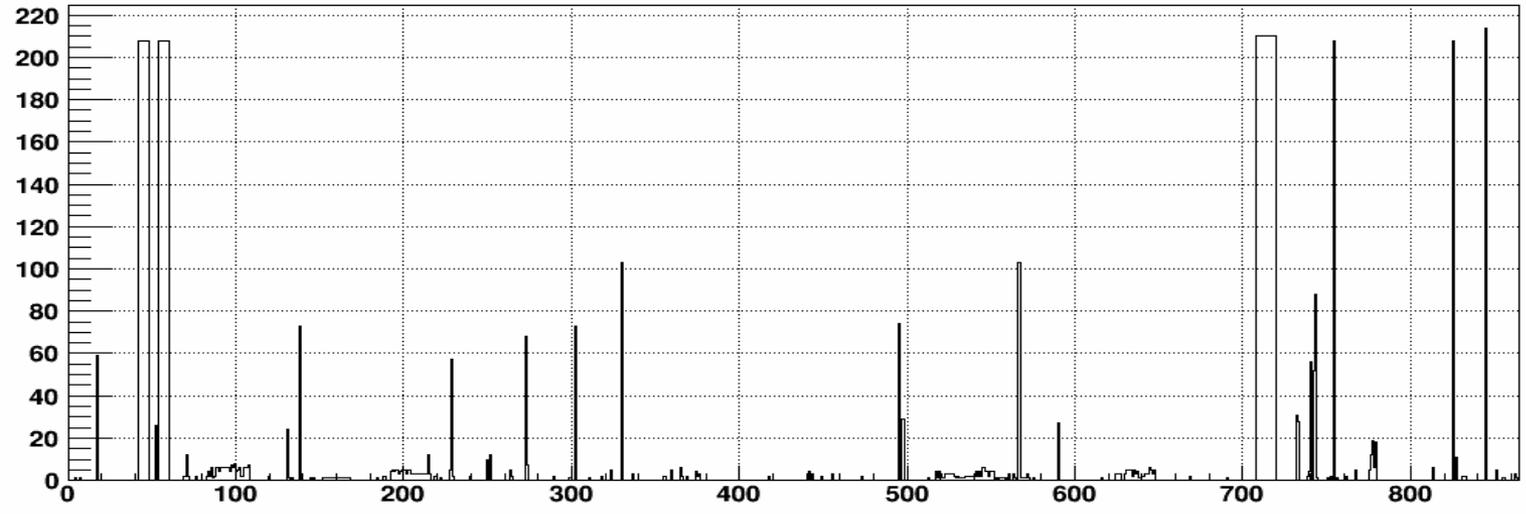
- Current scheme :
  - 3 sigma deviation from average (over all chips/channels) of Pedestal/Pedestal-noise/Common mode-noise marked as bad chip/channel (coming in next slides)
- One of time Bin (0 to 5) (ladder based)
  - CM mode noise cut 2 sigma down
    1. Low CM noise definitely dead but High CM noise need more careful consideration (No cut for chips with higher CM- noise)
    2. Mark all channels dead (exclude all of them from further steps )
  - Cut in Pedestal noise
    1. It is not Gaussian, cut on 1 sigma down, 60adc (regard to S/N) up (2 iteration) (next slide why no upper sigma cut)
    2. Common noise subtracting to have higher difference level between bad channels and good ones (to be investigated yet)
  - Pedestal cut
    1. 2 iteration (remove the 3 sigma )
    2. Cut on  $3\sigma < \text{Pedestal} < 3\sigma$
- Minimum X%? times(runs) registered as bad.
- Pedestal deviation rms is very good variable to mark bad chips , could be used for marking the very unstable chip/channels

# Pedestal / P-noise distribution run [15040040](#) Ladder#12

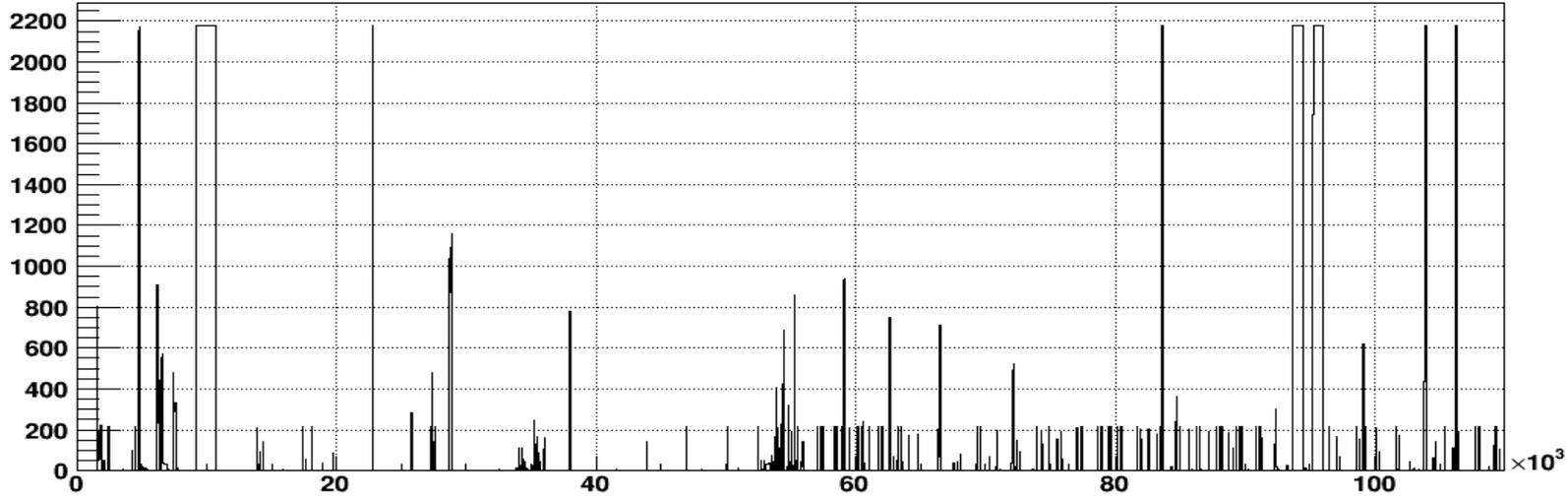


# Distribution of Bad Chip/channels current scheme

**Bad Chip over all runs**

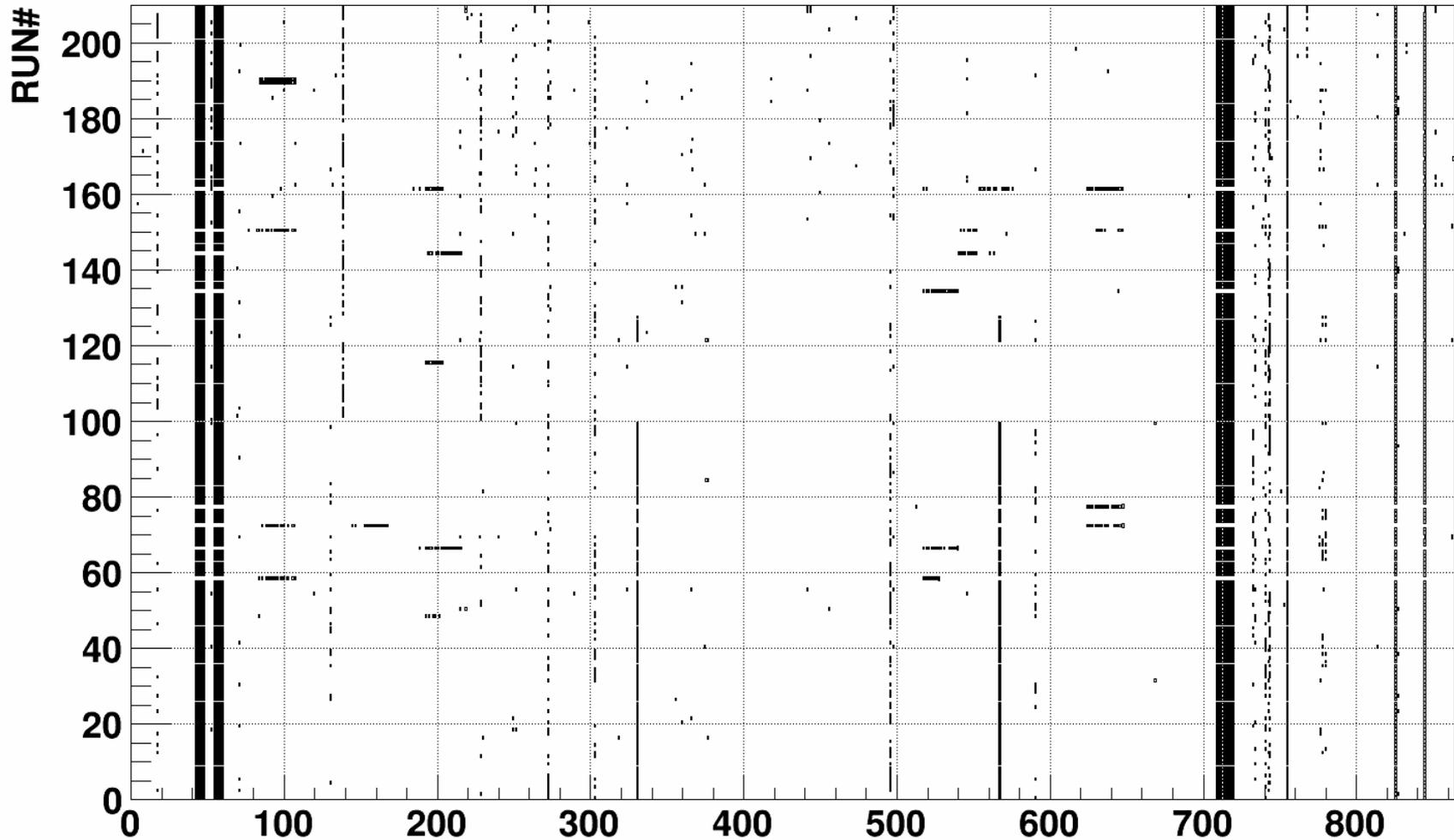


**Bad Channels over all runs**



# Distribution of Bad Chip/channels current scheme

Bad chip marked RunDay32to40

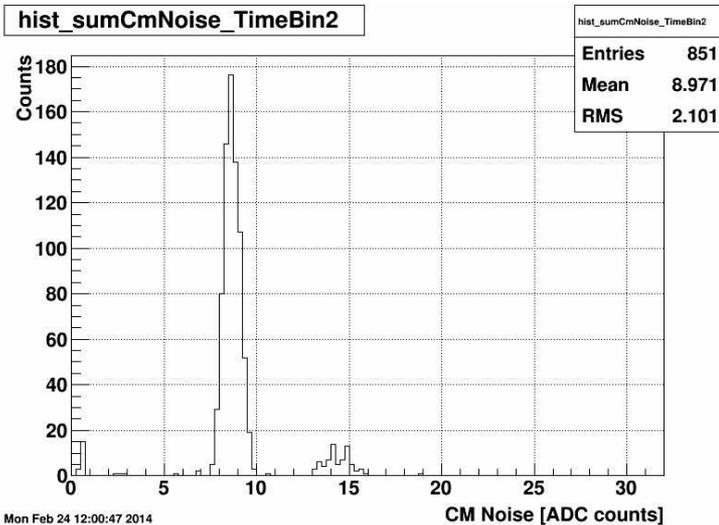


Back Up slides

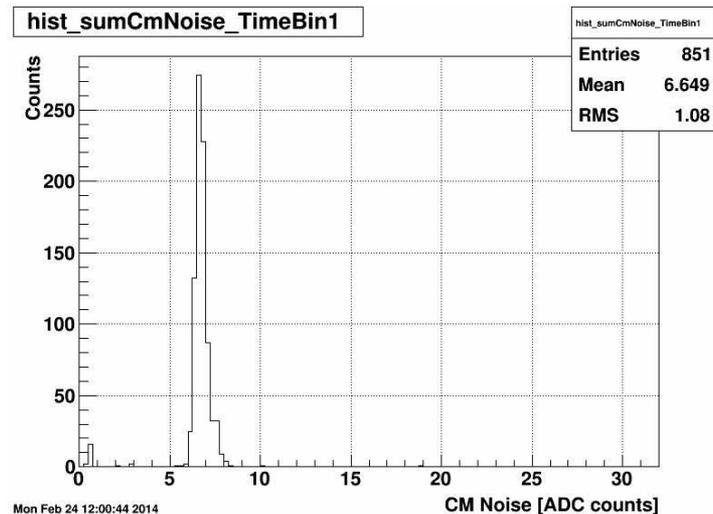
# Cm mode noise cut 2 sigma down

ChipID	Tbine	CM-Noise
843	8	7.21905
844	0	0
844	1	0
844	2	0
844	3	0
844	4	0
844	5	0
844	6	0
844	7	0
844	8	0
845	0	7.60622

ChipID	Tbine	CM-Noise
44	0	0.497816
44	1	0.530012
44	2	0.493568
44	3	0.393916
44	4	0.391387
44	5	0.403779
44	6	0.399957
44	7	0.396232
44	8	0.399292
45	0	0.617346

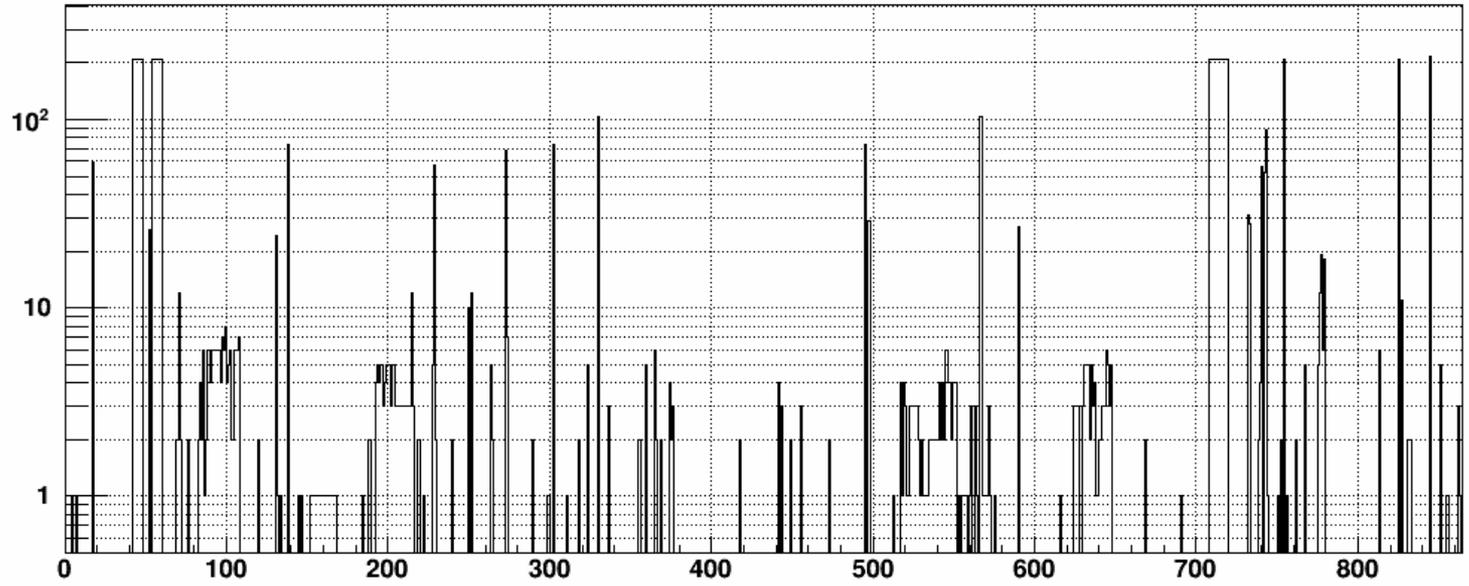


Mon Feb 24 12:00:47 2014

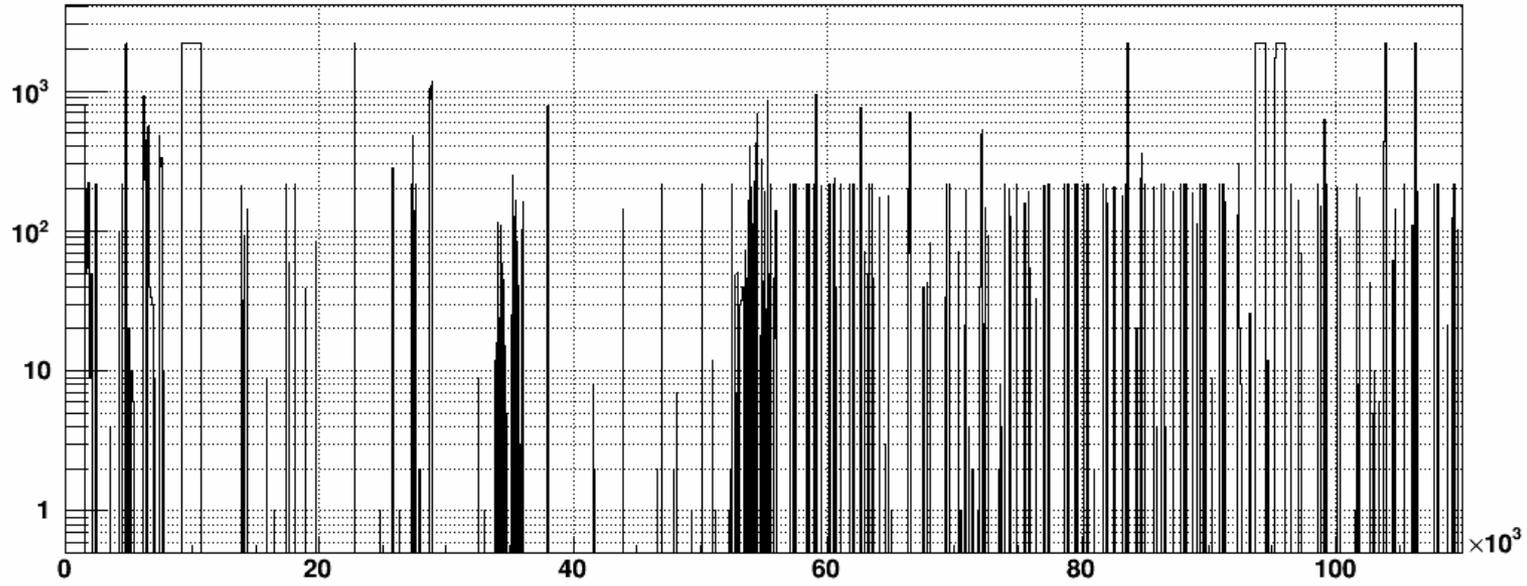


Mon Feb 24 12:00:44 2014

**Bad Chip over all runs**



**Bad Channels over all runs**



# IST Slow control GUI

- Previous GUI was based and depends on ioc to communicate for setting and controlling the IST
  - Many issue due to crates/network/ioc
- New GUI is using pure snmp commands to control crates.
  - Probable failure scenarios and related flags implemented.
  - Initial tests are done, Instruction manual is ready to be used by shift crews.

The screenshot displays the IST Slow control GUI with four main control panels and a terminal window. The panels are:

- IST CONTROL (ISTShiftCrew.v3.adl):** Features a cyan 'Turn-On' button, a red 'Turn-Off' button, and a yellow 'ShutDown' button. A red status indicator is present, and the text 'IST IS OFF' is displayed. A warning message 'Warning! bad shutdown' is shown at the bottom.
- IST Turn-ON (ISTON.adl):** Features a cyan 'TURN ON' button and a red status indicator. The text 'IST IS OFF' and 'Please Close when it is done' are displayed.
- IST Turn-OFF (ISTOFF.adl):** Features a red 'TURN OFF' button and a red status indicator. The text 'IST IS OFF' and 'Please Close when it is done' are displayed.
- IST Emergency Power Shutdown (ISTshutdown.adl):** Features a yellow 'ShutDown' button and the text 'Please Close when it is done'.

The terminal window (ISTON.sh) shows the following output:

```
SetCurrent for channel u203 to 10uA
VoltageRiseRate for channel u203 to 5,V
VoltageFallRate for channel u203 to 5,V
SetVoltage for channel u204 to 70,0
SetCurrent for channel u204 to 10uA
VoltageRiseRate for channel u204 to 5,V
VoltageFallRate for channel u204 to 5,V
SetVoltage for channel u205 to 70,0
SetCurrent for channel u205 to 10uA
VoltageRiseRate for channel u205 to 5,V
VoltageFallRate for channel u205 to 5,V
SetVoltage for channel u206 to 10uA
SetCurrent for channel u206 to 10uA
VoltageRiseRate for channel u206 to 5,V
VoltageFallRate for channel u206 to 5,V
SetVoltage for channel u207 to 70,0
SetCurrent for channel u207 to 10uA
VoltageRiseRate for channel u207 to 5,V
VoltageFallRate for channel u207 to 5,V
HV outputs are on Now truning ON ....
-----
WARNING Please wait to stabilize the HV outputs
Wait 19 seconds.....
```