

## “Timeout errors”:

- They disappear when the TOT\_EN and the OR\_STRETCH fields in the GTRC CSR are set to their default values (no errors and good TOT data coming out).
- To be investigated: were non-default values expected to produce timeout errors?

## “Ladder 4 problems”:

### • Diagnostics:

- Fully efficiency not reached in charge injection (ladders 4 and 3).
- Noise occupancy (ladders 4 and 3) sometimes much higher than the normal ( $10^{-4} - 10^{-2}$  @ 30 DAC threshold); not stable in time.
- Hitmap slightly more populated than the average (factor of 2) while collecting data with cosmic rays.
- TOT distribution very clean (no differences with the other layers).
- Clear peak @ about 64 in the hit multiplicity (in 1% of the events almost all the ladder seems over threshold); more than 64 hits are sometimes read out??
- Detection efficiency very close to 100%.
- Impact on overall detector performance seems moderate.

### • Solutions:

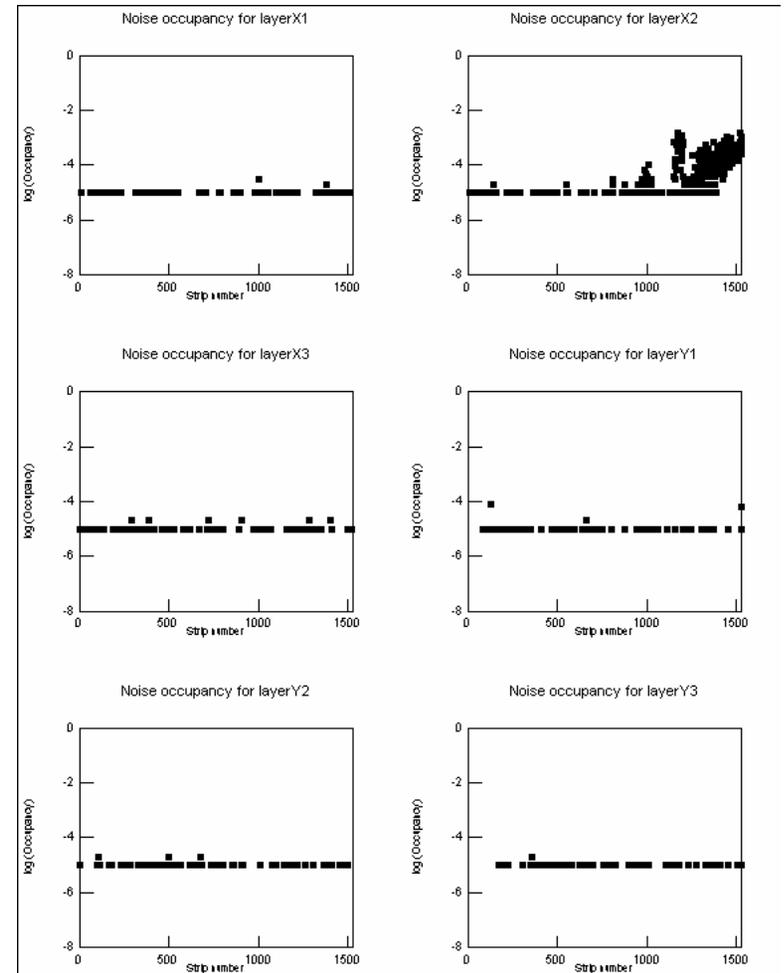
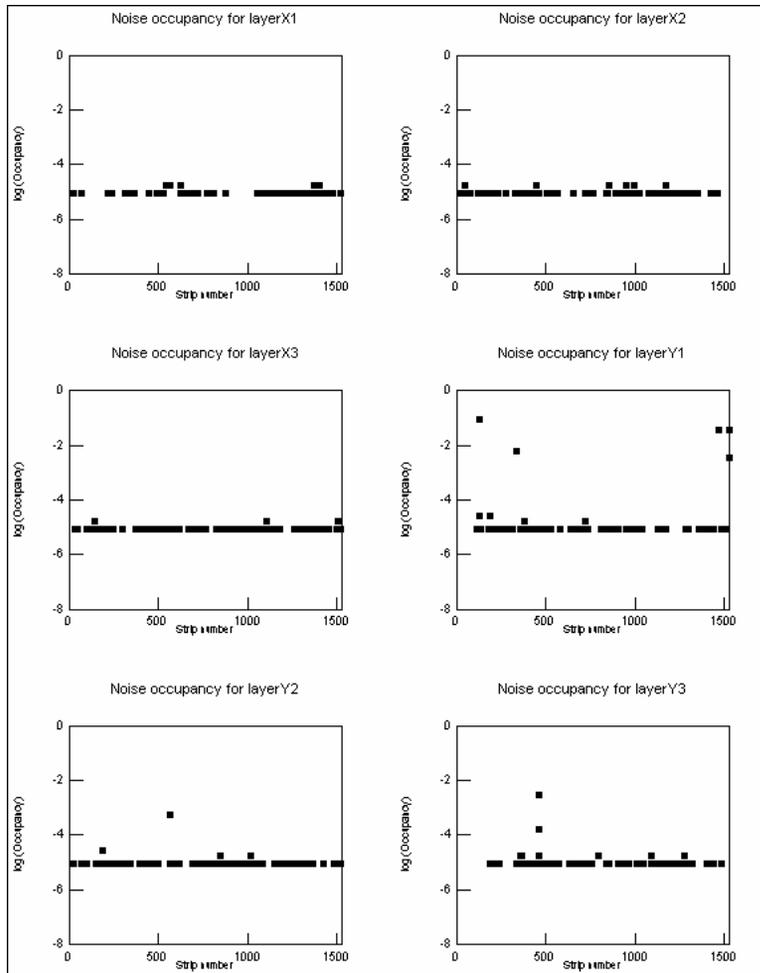
- Behaviour likely related with the repair on the bias line. Probing the HV right on the detector would be a definitive evidence but is too dangerous.
- 1<sup>st</sup> possibility: avoid any further repair (and possibly mask  $\frac{1}{2}$  layer – rates goes down by a factor of 2).
- 2<sup>nd</sup> possibility: remove a sidewall and put some conductive glue across the two HV lines (requires about 1 day?). Integration with CAL doesn't prevent from doing it later.

# Noise occupancy

Threshold = 30 DAC, range 0. ~ 100000 events, most of the strips never read out.

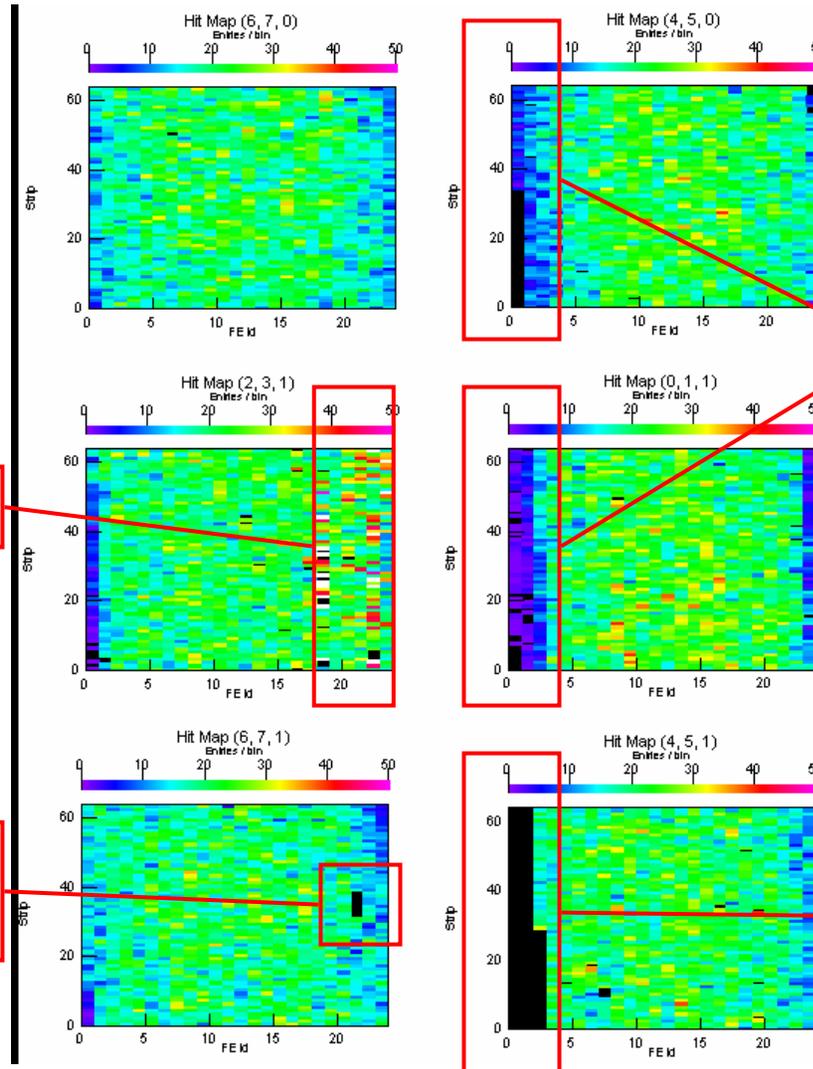
All strips enabled.

13 noisy strips masked, 10 minutes later.



# Cosmics - hitmaps

Threshold = 30 DAC, range 0, 13 strips masked. ~ 15000 events collected.



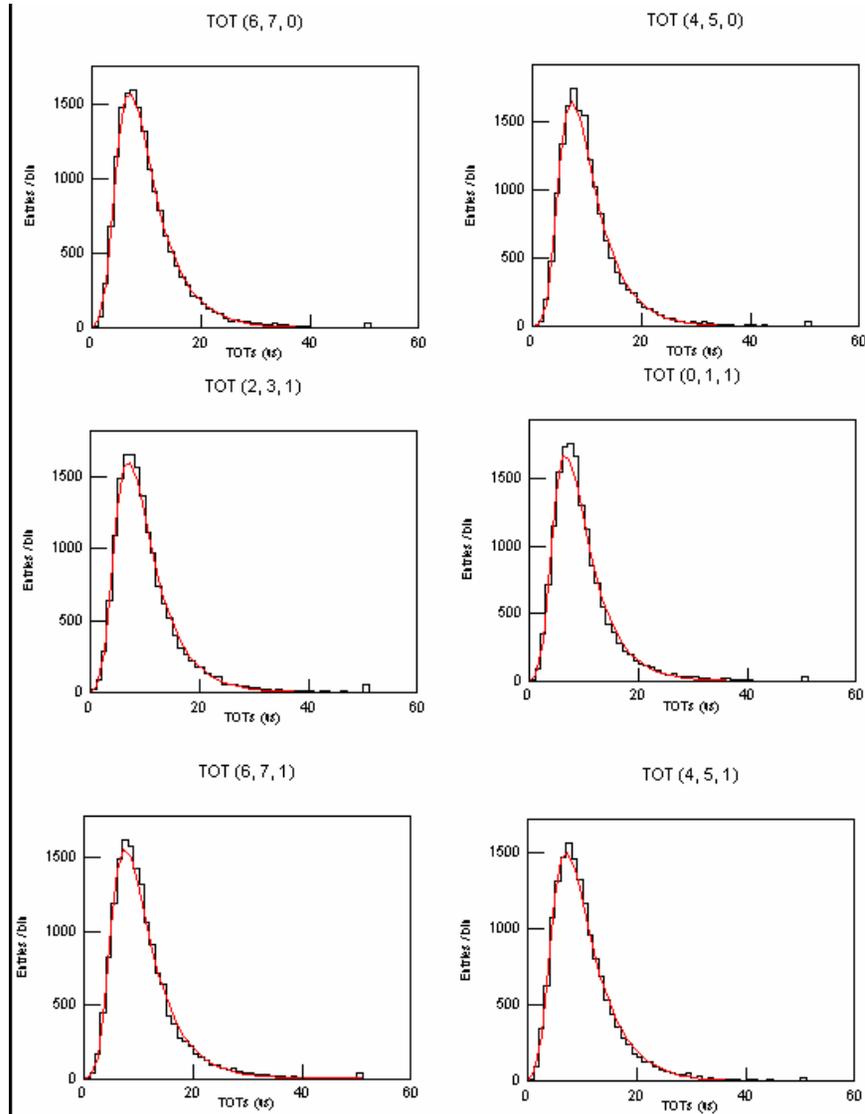
X2: "ladder 4" issue.

Y1 and Y2: "shadow" of Y3.

X3: 7 wire bonds removed.

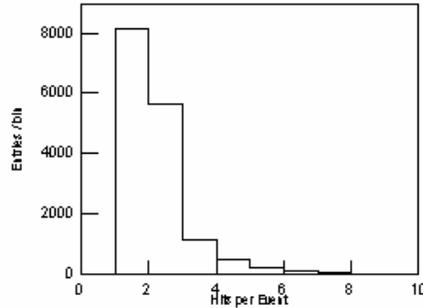
Y3: 157 wire bonds missing (due to problems with pitch adapter).

# Cosmics - TOT

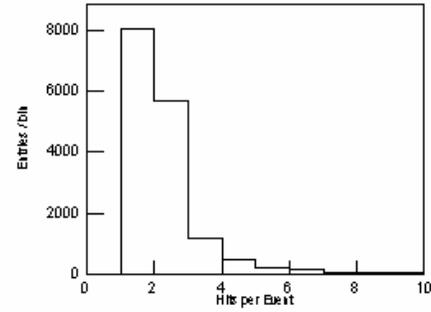


# Cosmics – hit multiplicity

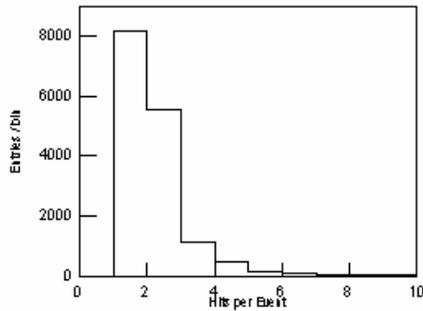
Hit Multiplicity (6, 7, 0)



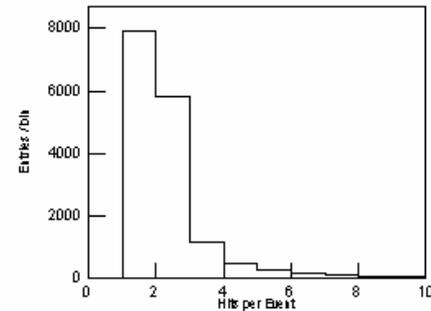
Hit Multiplicity (4, 5, 0)



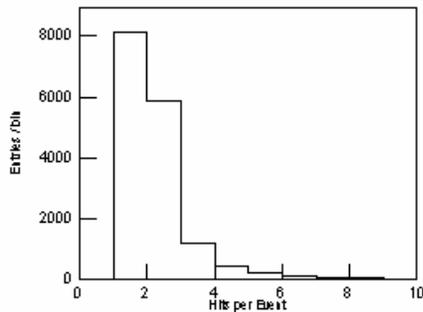
Hit Multiplicity (2, 3, 1)



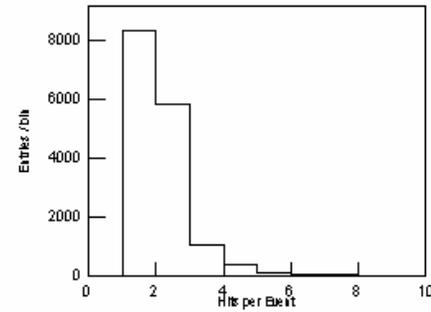
Hit Multiplicity (0, 1, 1)



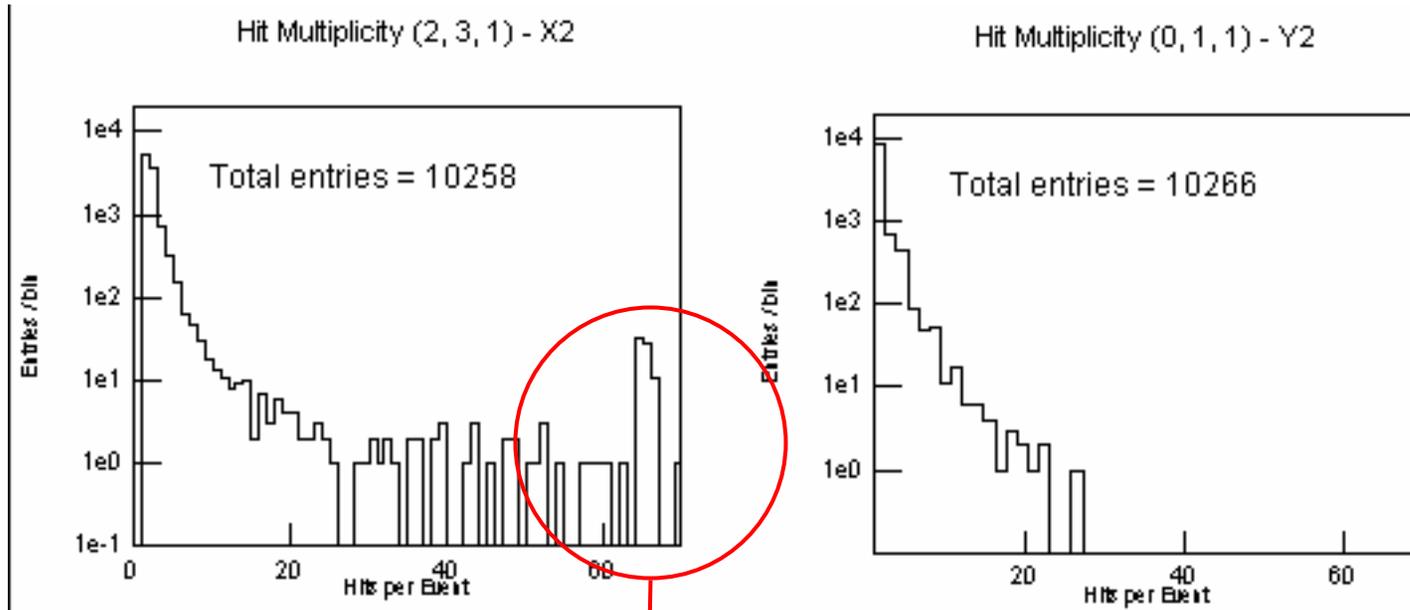
Hit Multiplicity (6, 7, 1)



Hit Multiplicity (4, 5, 1)



# Cosmics – hit multiplicity



~ 100 events (1% of total)

# Detection efficiency

