“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.
  - 1st possibility: avoid any further repair (and possibly mask ½ layer – rates goes down by a factor of 2).
  - 2nd 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

TOT (6, 7, 0)

TOT (4, 5, 0)

TOT (2, 3, 1)

TOT (5, 1, 1)

TOT (6, 7, 1)

TOT (4, 5, 1)
Cosmics – hit multiplicity
Cosmics – hit multiplicity

Total entries = 10258

Total entries = 10266

\~ 100 events (1\% of total)
Detection efficiency