β sources on and off
Characterising sensor behaviour
eLog

MAPS – First physics results!
MAPS Group Meeting, RAL

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CALICE
Calorimeter for ILC

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Outline

β sources on and off
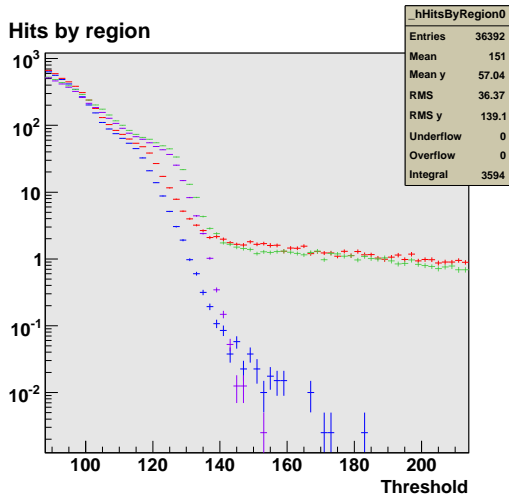Characterising sensor behaviour
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Since our last meeting. . .

▶ 2.2$k\Omega$ resistor replaces 50Ω resistor on monostable current bias supply

▶ Shapers and samplers adversely affect each other (tendency for "blasting" behaviour)

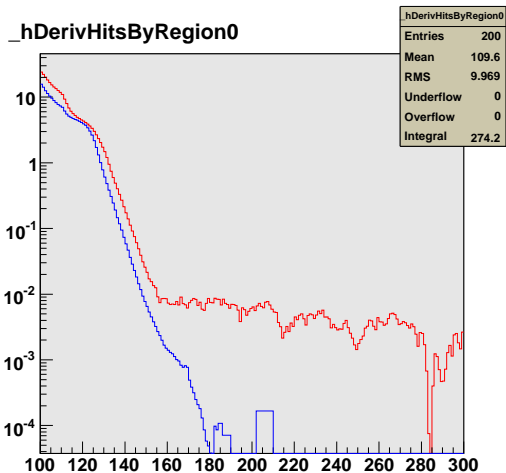▶ Shapers work; samplers . . . no hints yet why not (see Paul)

All that follows is for the shapers

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Source on, source off

Counting total number of hits in regions 0 and 1 (shapers only)

Derivative of similar run
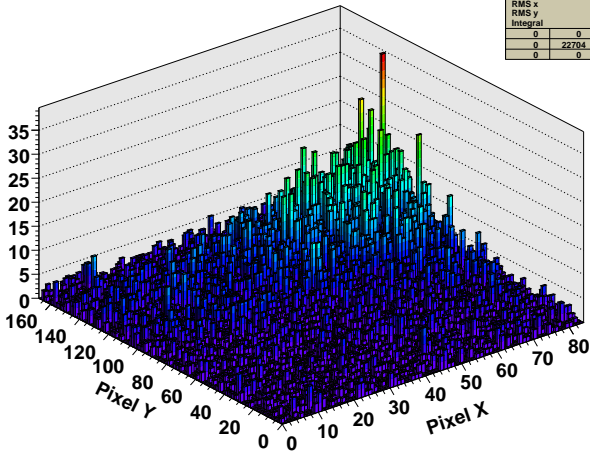
_hDerivHitsByRegion0

_hDerivHitsByRegion0	
Entries	200
Mean	109.6
RMS	9.969
Underflow	0
Overflow	0
Integral	274.2

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Displaced source
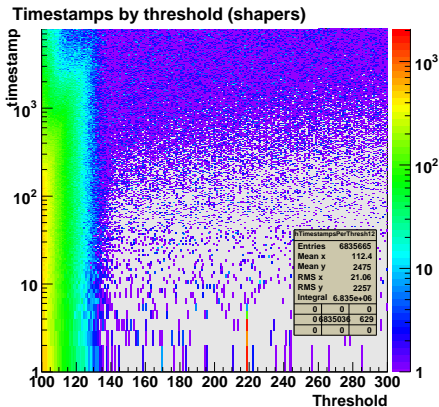
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Timestamps as a function of threshold
With source on

- ▶ Low thresholds ⇒ memory fills quickly, and there are lots of them
- ▶ High thresholds ⇒ Uniform timestamp distribution

Conclude: (qualitatively) expected behaviour!
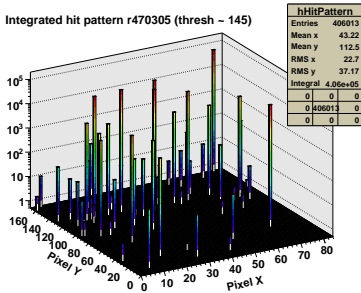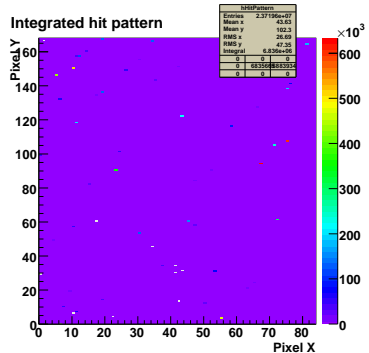There's a mini–blast at 220: one bunch train. But this was with a "dodgy" board.

Timestamps by threshold (shapers)

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Noise patterns
Laser
Americium α source
Lights on, lights off etc.

Sources of noisy pixels
mpsThreshold run at thresh ~ 145

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Are there patterns?

Apparently not.

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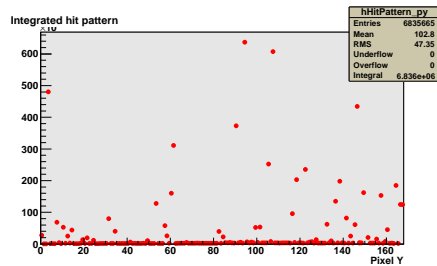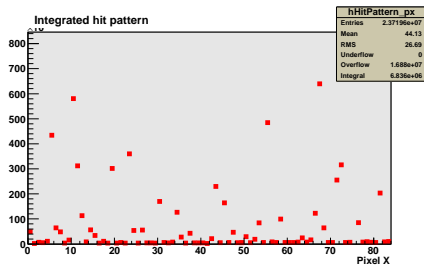
Finding noisy and quiet pixels
Single threshold of 145, a long run ($\sim$ 3 hours)

Threshold Efficacy - r470310

hThreshEfficacy	
Entries	14112
Mean	29.96
RMS	438
Underflow	0
Overflow	73
Integral	1.404e+04
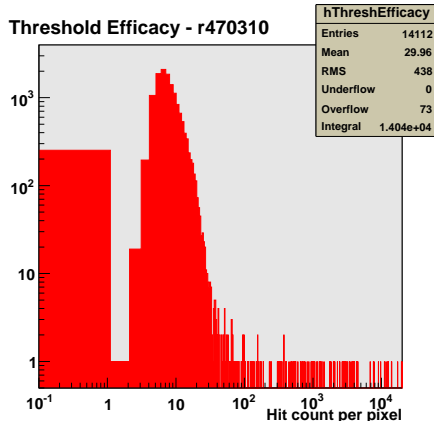
I estimate $\sim$ 2% of pixels are outside of the peak (handwaved!)

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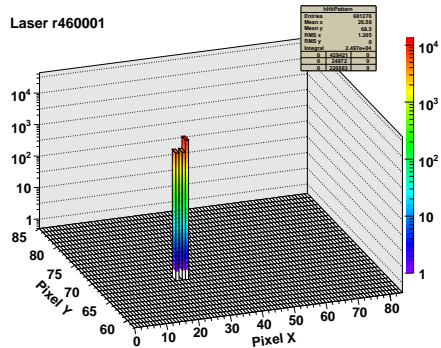
Using laser set up at RAL

Region 1 is more noisy that region 0
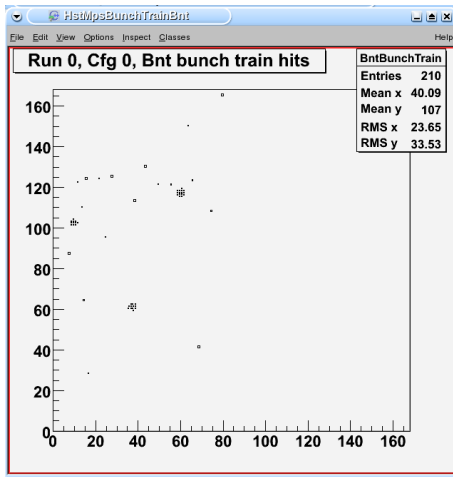Easier to pick out any laser hits in region 0

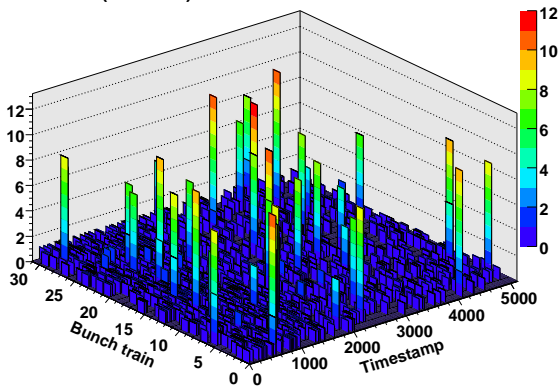**Laser Region 0 hits**

See laser hits at $(x, y) \sim (25, 69)$

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Using an α source to see splodges

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Lights on, lights off etc.
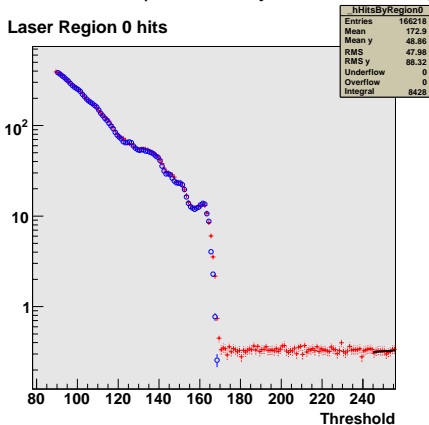
Are all the timestamps reported simultaneously?

Consider a few bunch trains...

Americium (α source) r470293

Excellent news!

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Noise patterns
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Americium α source
Lights on, lights off etc.

Noise rates
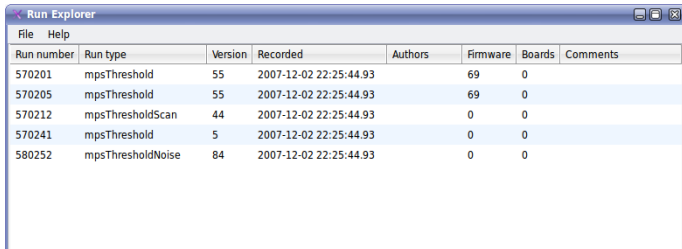mpsThreshold -v 137 -s 300 ⇒ threshold ∼ 145

Total number of hits in regions 0 and 1

- ▶ Lights on: 108,614
- ▶ Cloth on: 62,357
- ▶ Top open: 77,021
- ▶ Cloth on, no ground: 68,254

Conclude: keep sensor in the dark

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Like an address book of runs

- Will integrate with GUI
- Extremely lightweight backend DB (HSQLDB) – may migrate to MySQL, DB2, etc.
- What do we need for DESY?

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Any other business