Apsel3D_TC chip characterization

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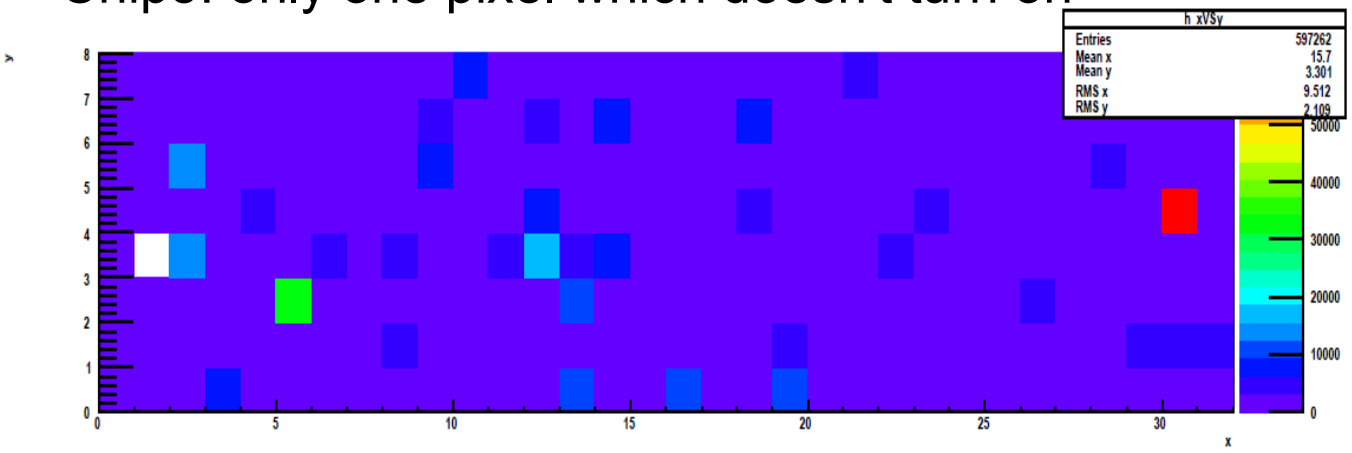
Outline

- **Noise scans:**
  - Chip5
  - Chip6

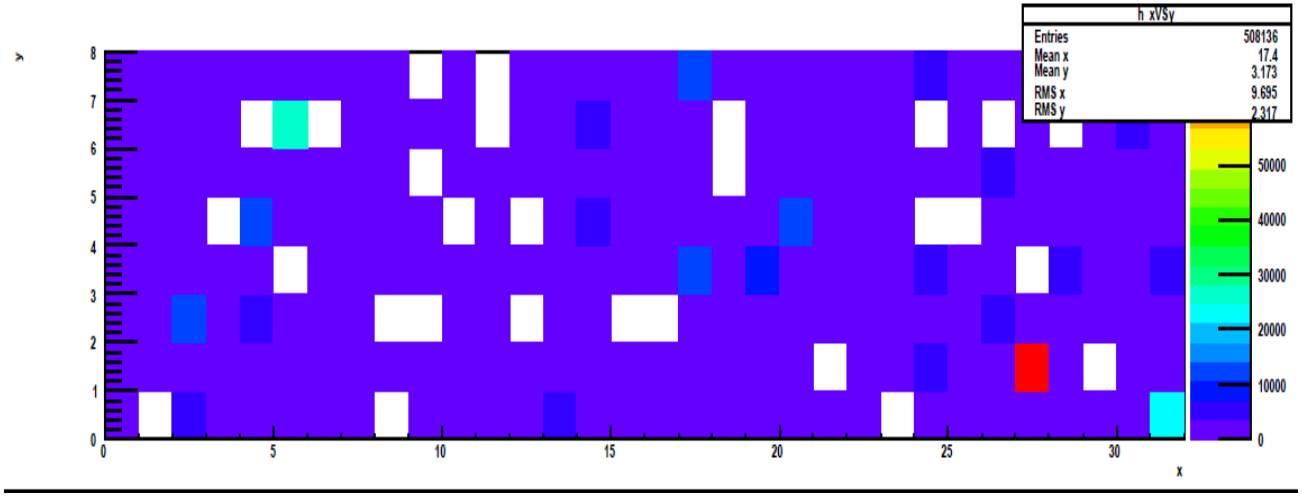
- **Differential spectrum with the Fe55 source**
  - Chip5

Noise scans: Chip5 and Chip6

- Performed noise scans from 1250 up to 1500 DAC (100 steps of 4 DAC)
- Chip5: only one pixel which doesn't turn on

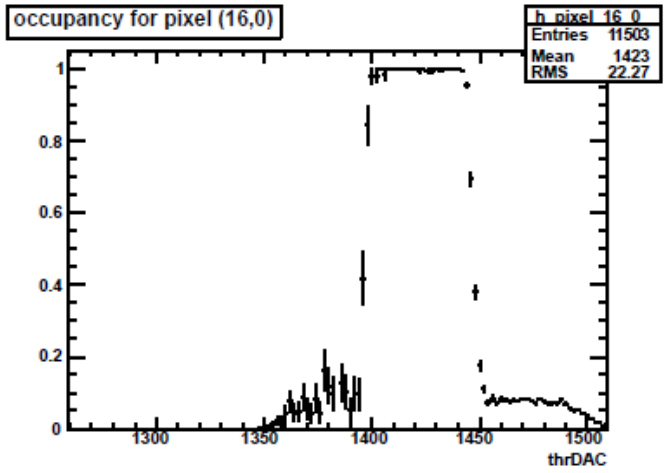


- Chip6: a significant amount of dead pixels (28 ⇒ 11%)

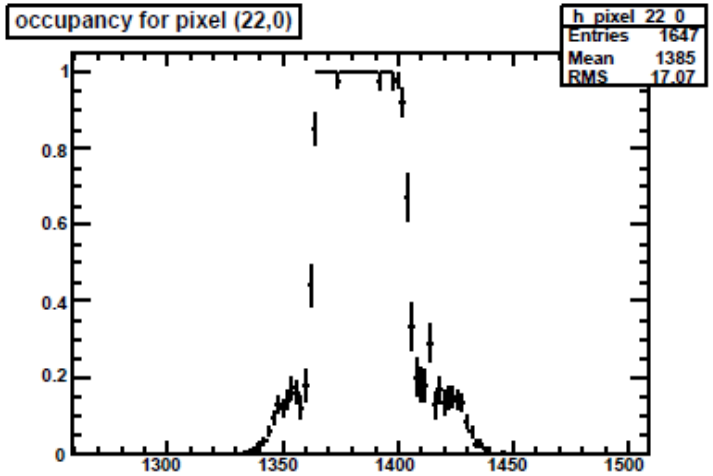


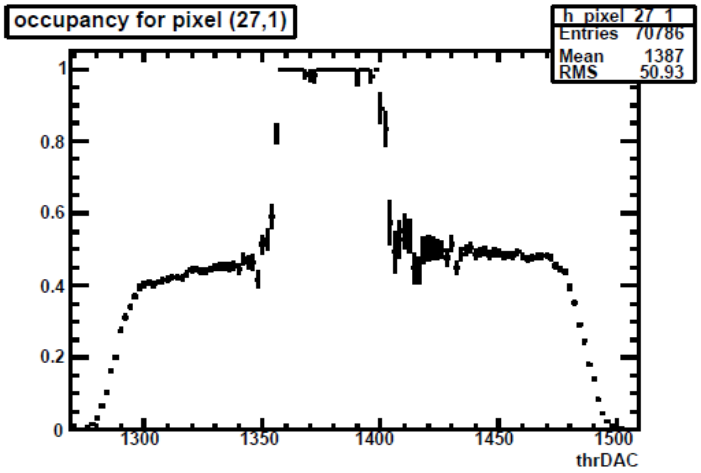
Noise scans: Chip5 and Chip6

- Some pixels for both chips show strange features
- The fit poorly converges in those cases

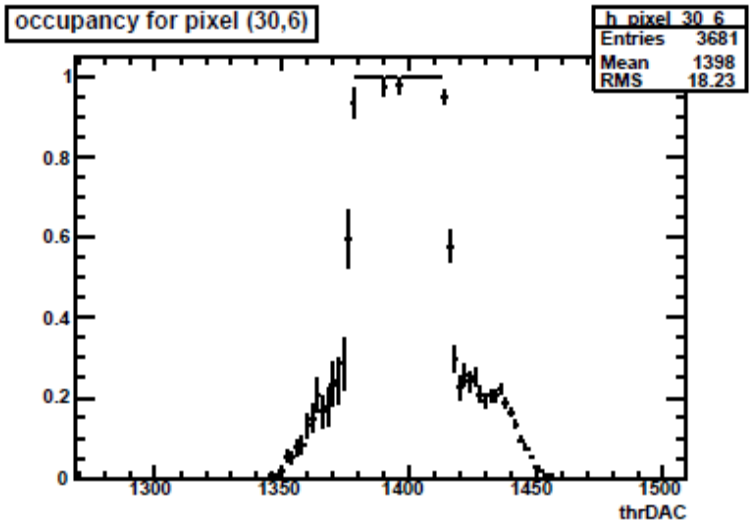


Chip5

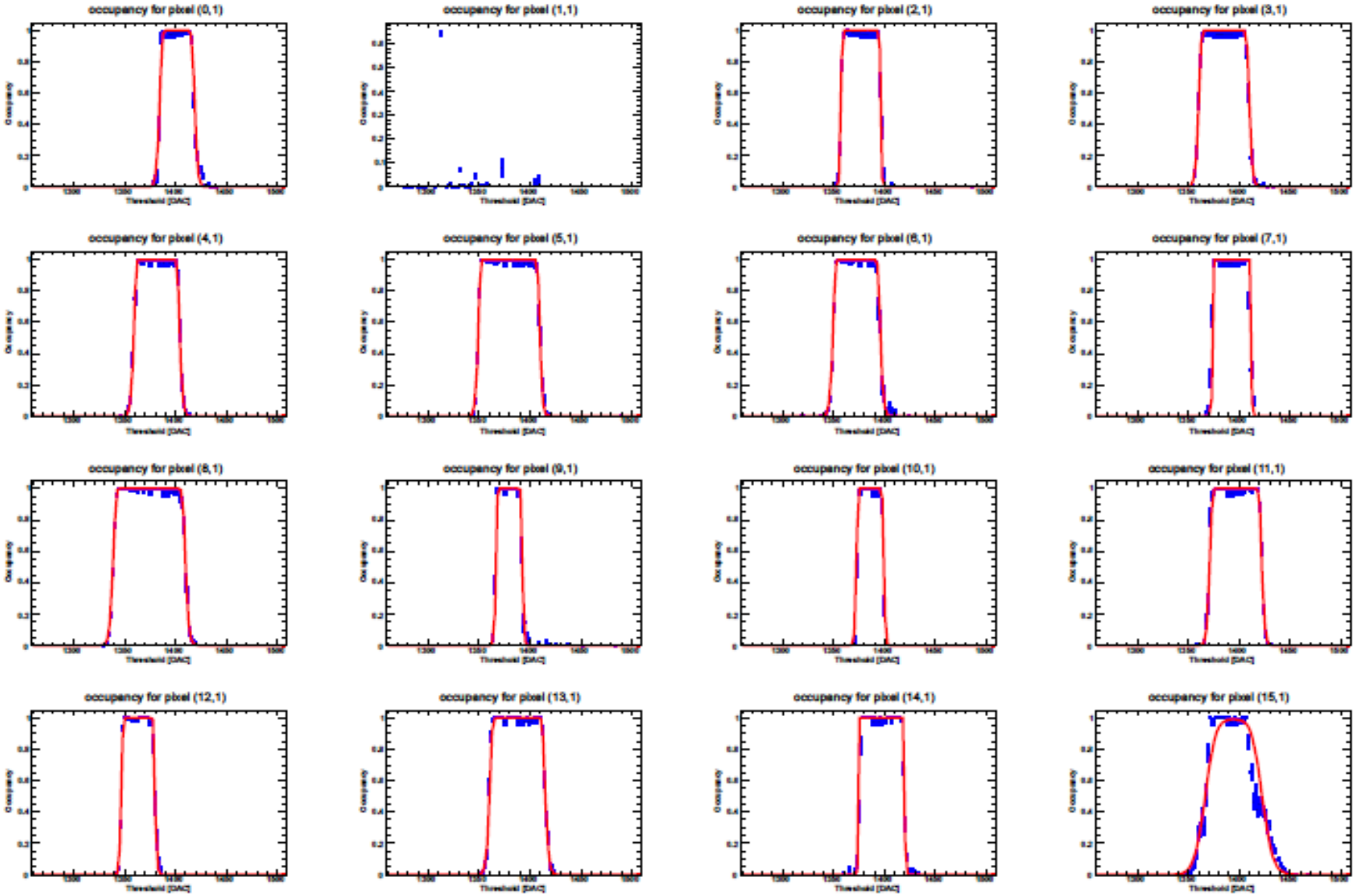




Chip6

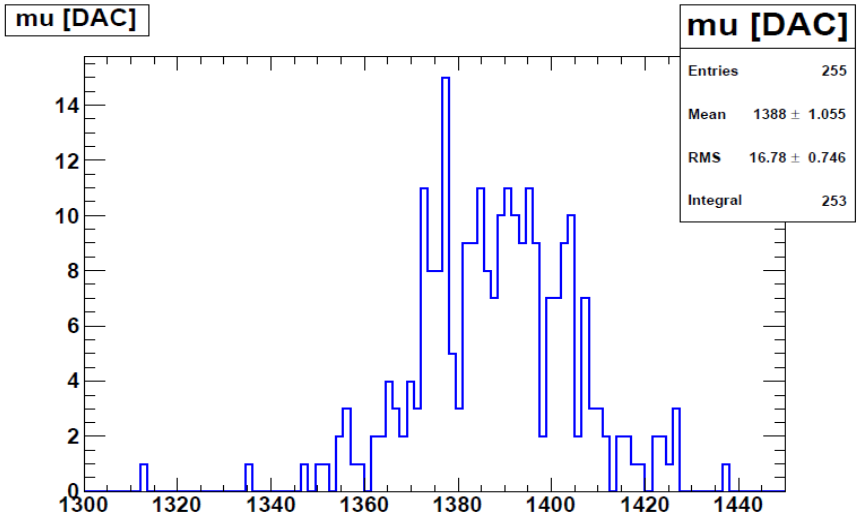


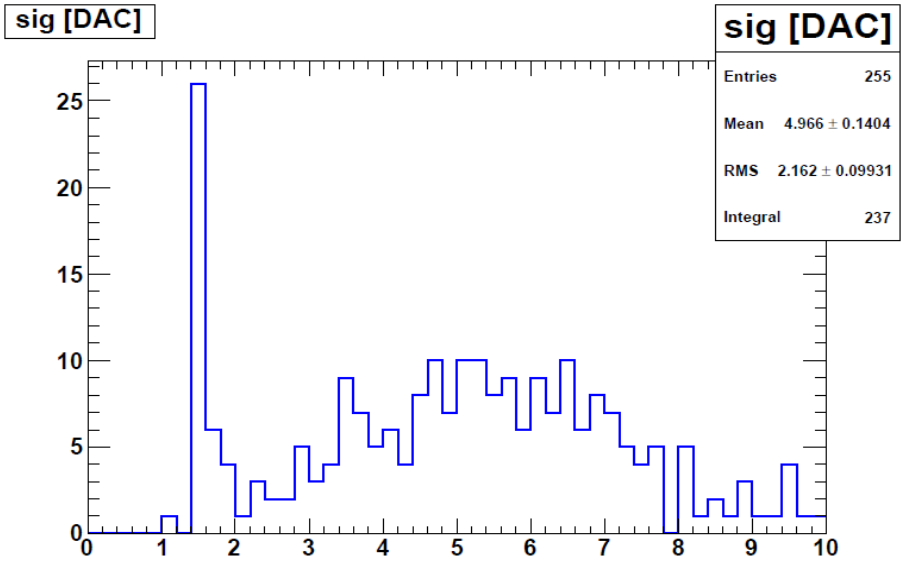
Noise fit: Chip5

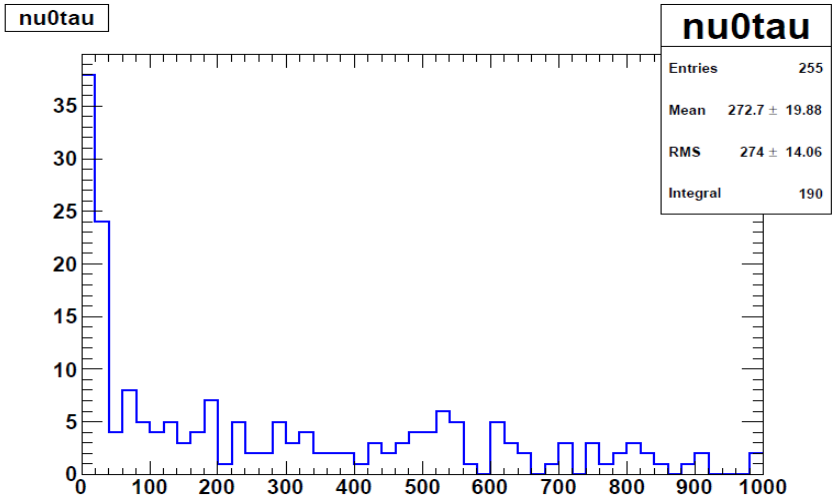


Noise scans: Chip5

- In some cases the fit doesn't converge properly, still working on it.
- The quantities below need to be interpreted carefully





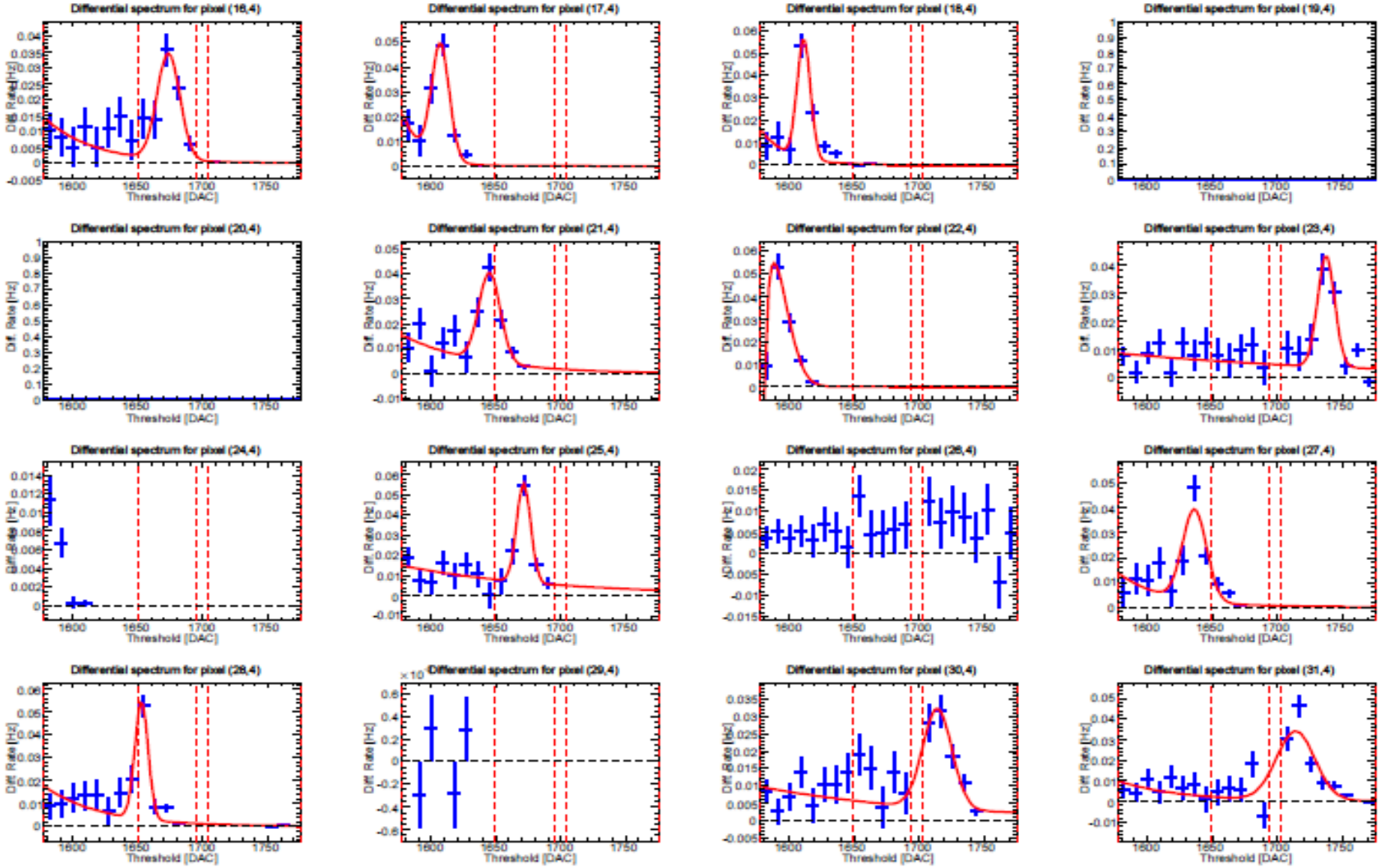


Fe55 source: Chip5

- With the Fe55 source took data varying the threshold, from 1654 to 1780 in steps of 9 (all units in DAC) (three independent runs with non-overlapping intervals) => Integral spectrum
- Out of the integral spectrum calculated the differential spectrum (bin_i+1 – bin_i on the integral spectrum)
- Put together the differential spectrum of all the runs
- Tried to look for the Fe55 peak and fit it => Guassian+exponential
- In many cases the peak is not seen and in some other the fit didn't converge
- In this 1st look will only show the results for a selection of pixels that by eye show good behaviour

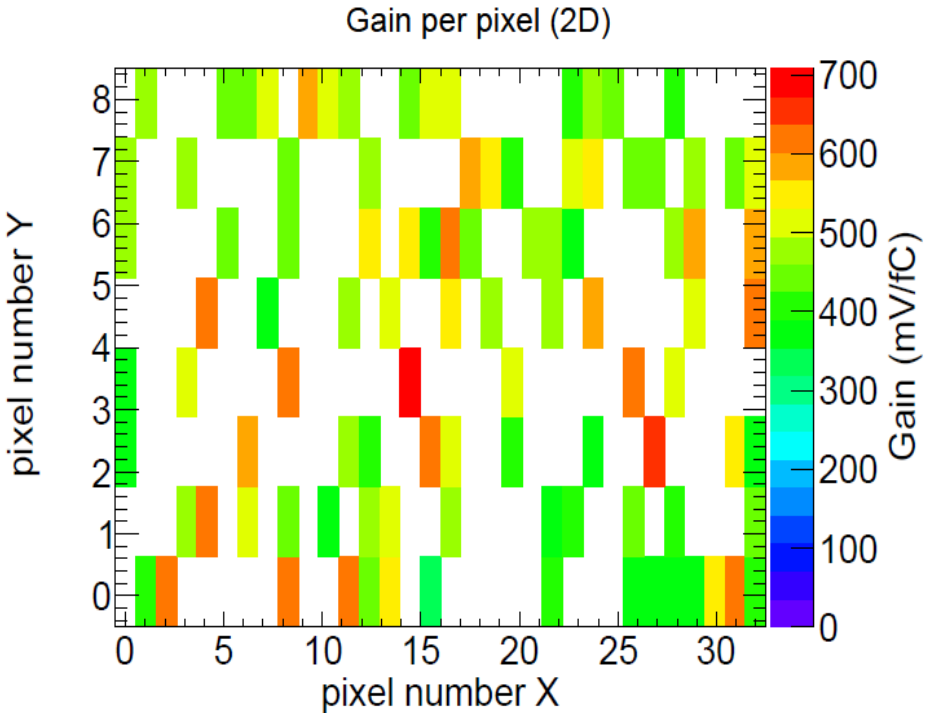
Fe55 source: Chip5

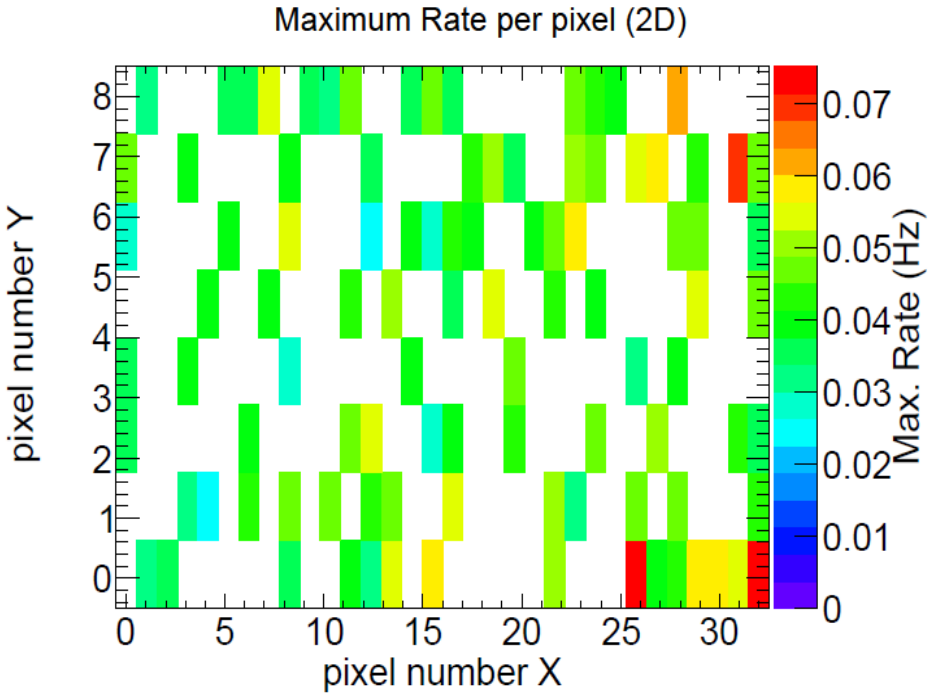
- Example of the fit:



Fe55 source: Chip5

- Once located the fit, use the noise scan to subtract the pixel baseline and then calculate the gain
- The width of the peak is compared with the amount of noise estimated from the noise scan





Fe55 source: Chip5

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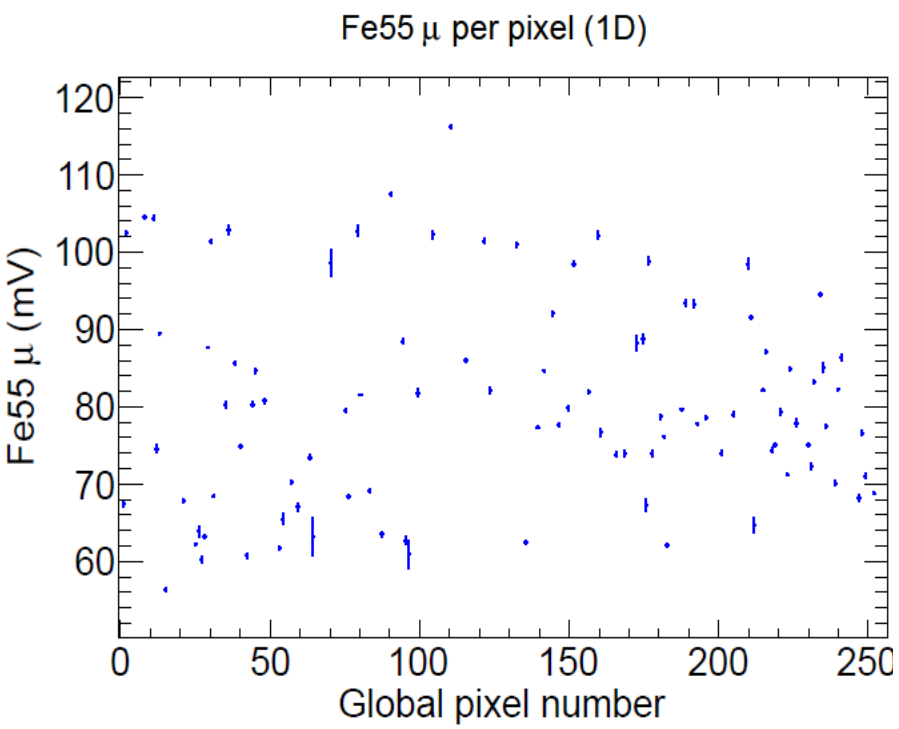
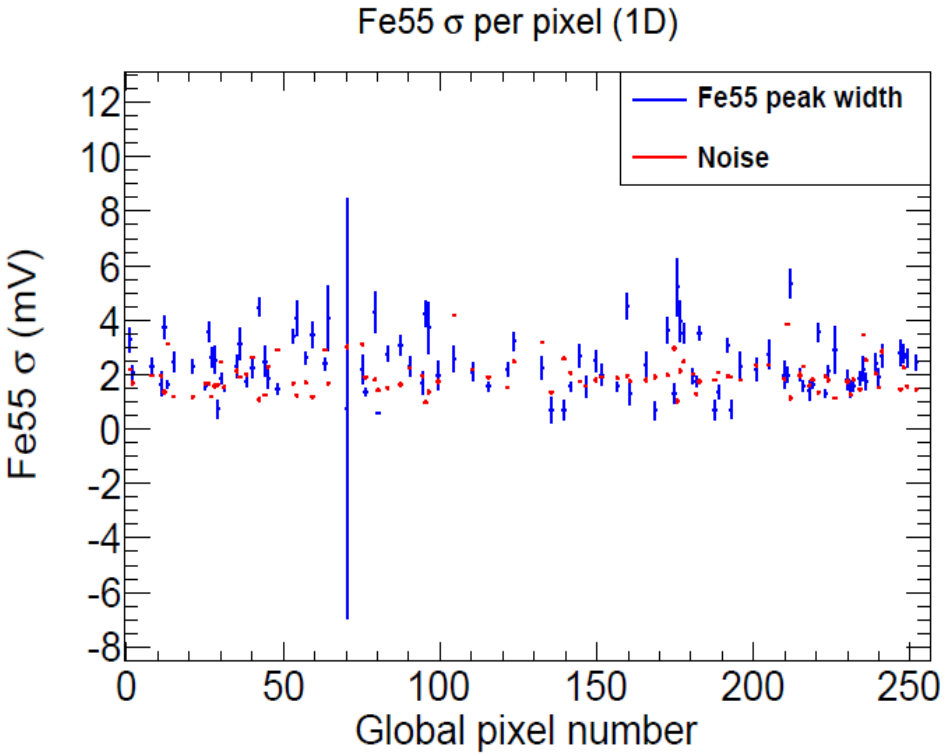
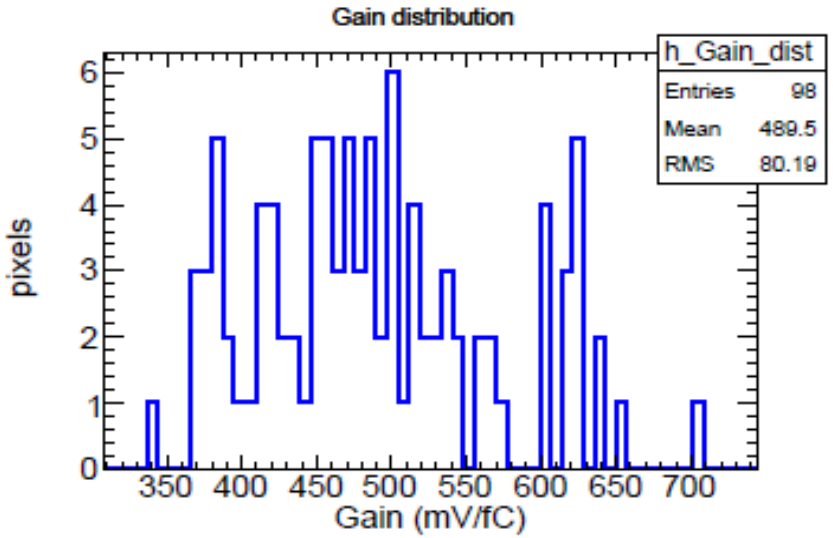
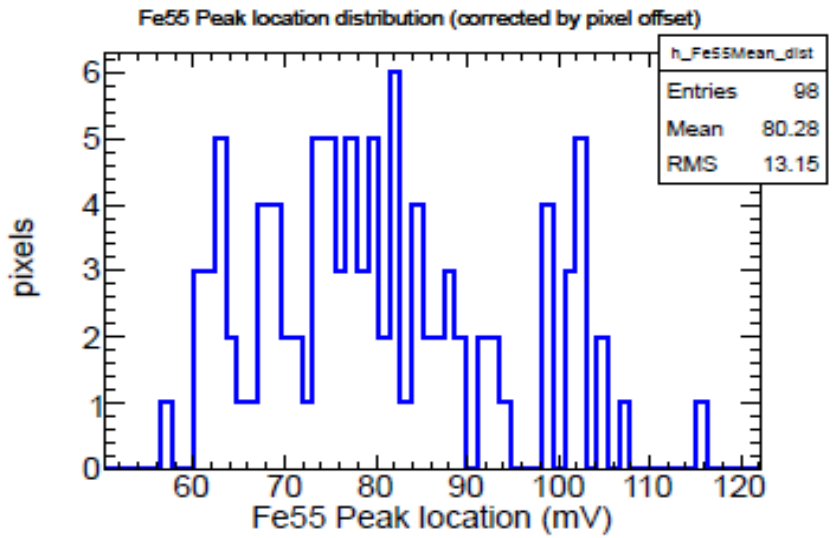
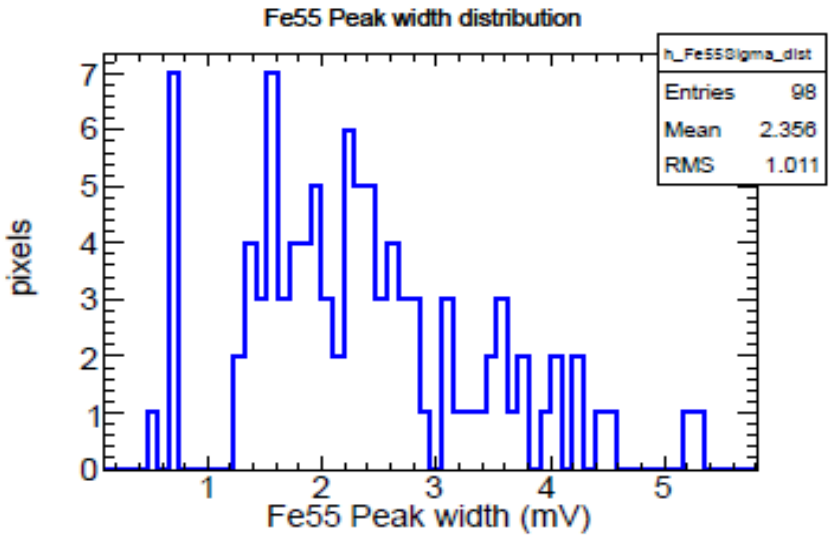


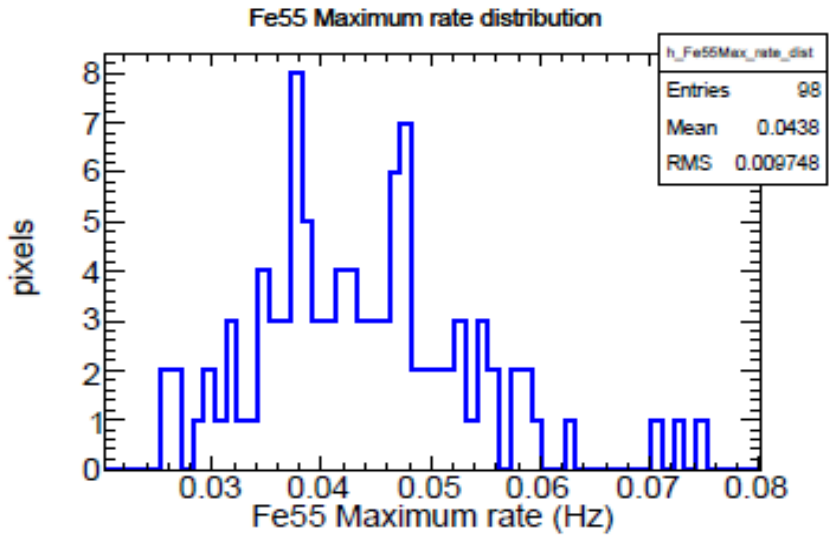


Fe55 source: Chip5





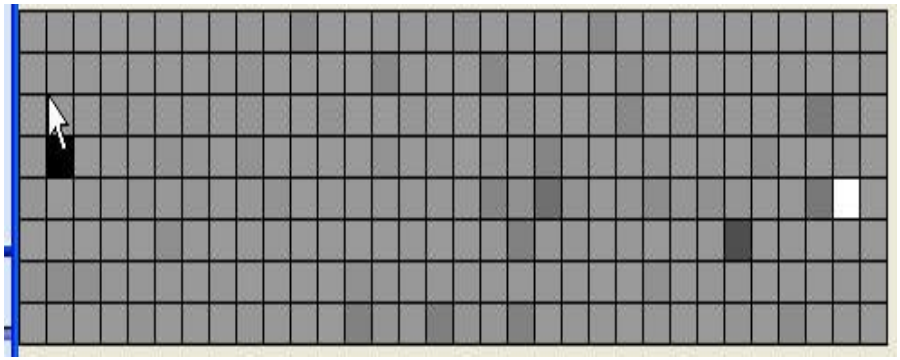




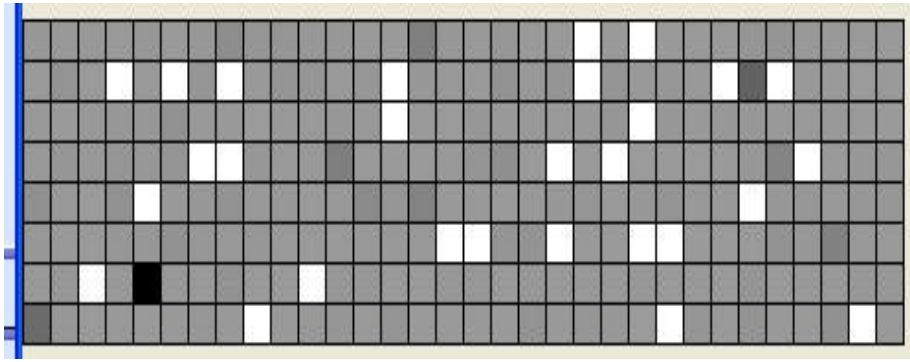
Backup

Fe55 source: Chip5

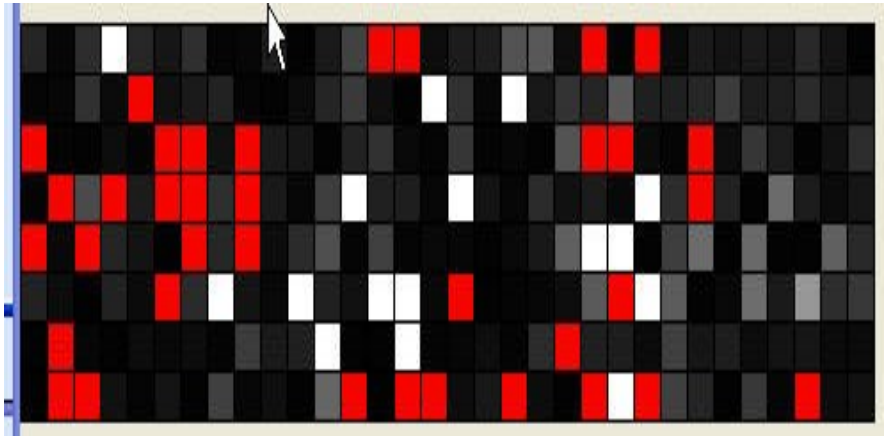
Noise scan Chip5



Noise scan Chip6



Fe55 at 1520
DAC Thr Chip5



Fe55 at 1477
DAC Thr Chip6