Status Report

Owen Miller

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Column Corruption Study

- This presentation contains a summary of results from column corruption studies using sensor 18.
- Each study focused on a single column and consisted of two sets of threshold scans.
- The first set of threshold scans were taken when all the pixels in the column were active at the same time.
- The second set of threshold scans were recorded with only one pixel in the column active in each run.
- The results of comparing these two sets of threshold scans are shown in the following slides.

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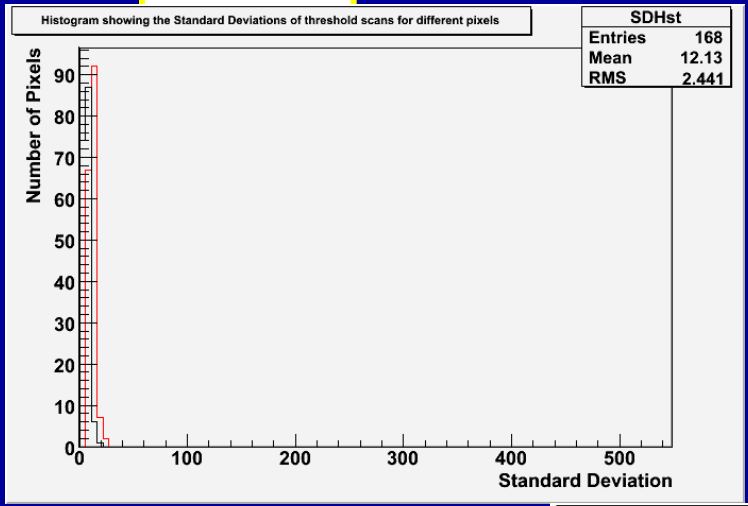
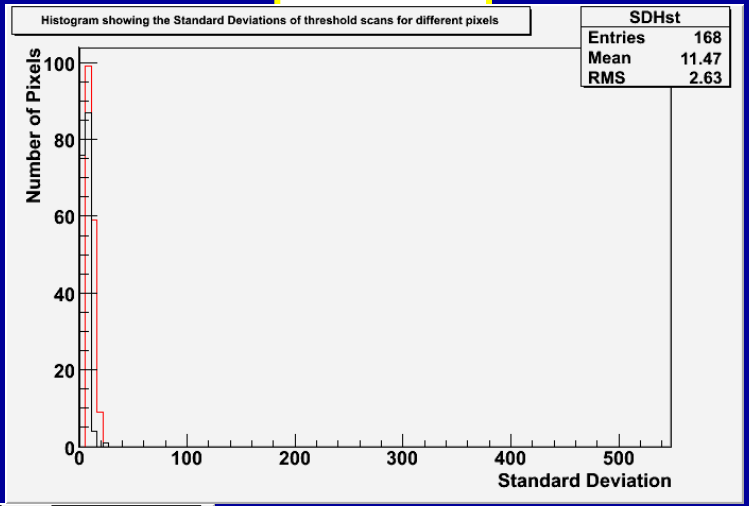
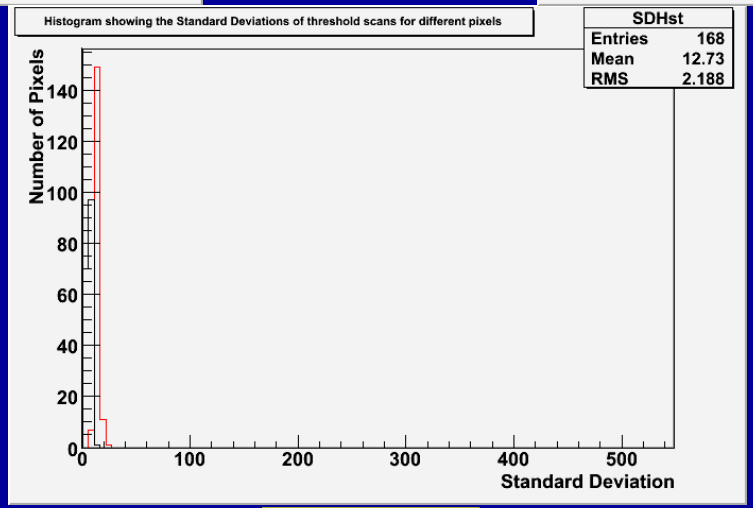
The standard deviation of pixel threshold scans typically increases if all the pixels are active at the same time:

Column 13



Column 14





Column 40

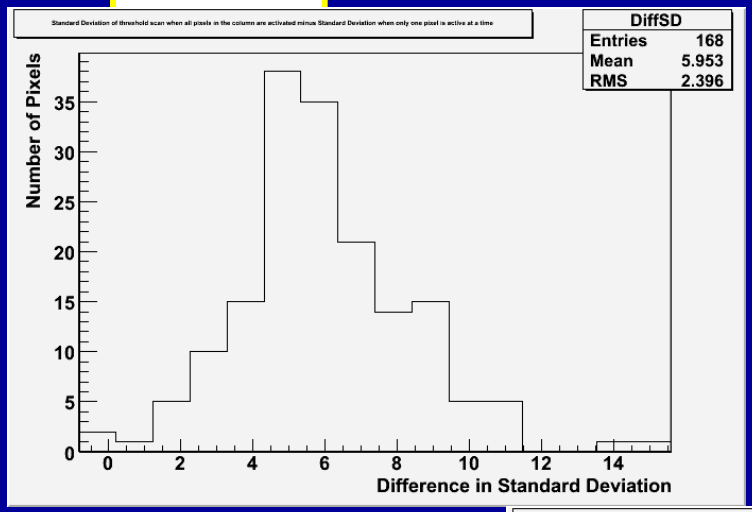
- All pixels active
- One pixel active at a time

Owen Miller

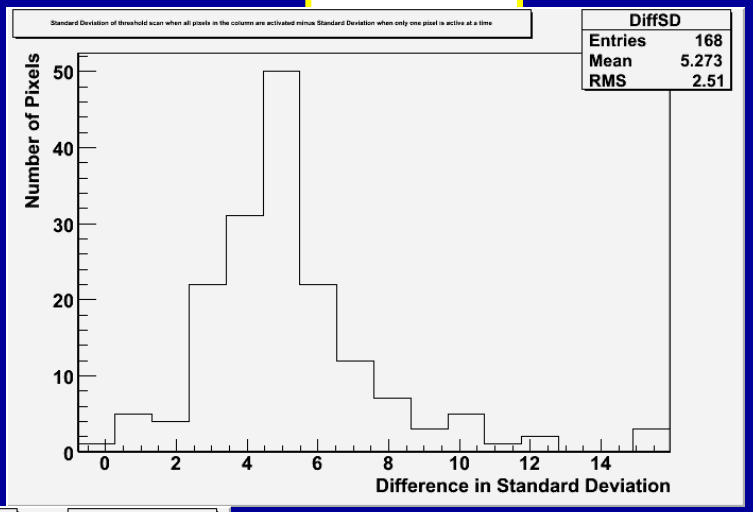
4/06/2008

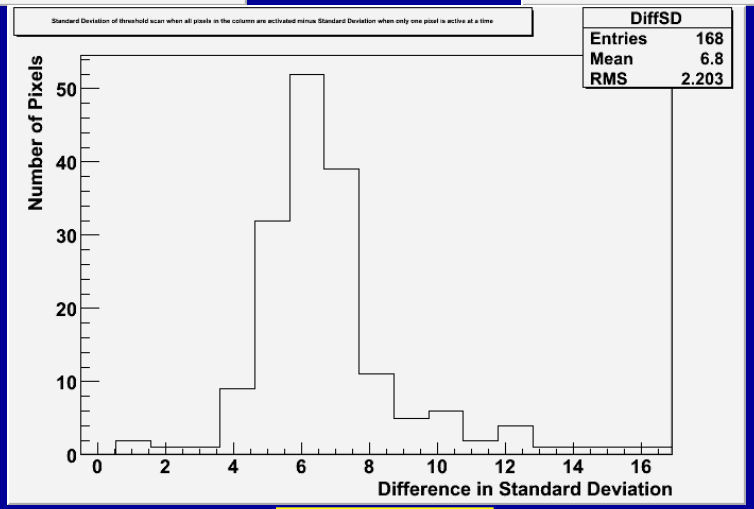
The number of threshold units the standard deviation shifts by seems to follow a fairly consistent pattern:

Column 13



Column 14





Column 40

Titles on the histograms read: Standard Deviation of threshold scan when all pixels in the column are activated minus Standard Deviation when only one pixel is active at a time.

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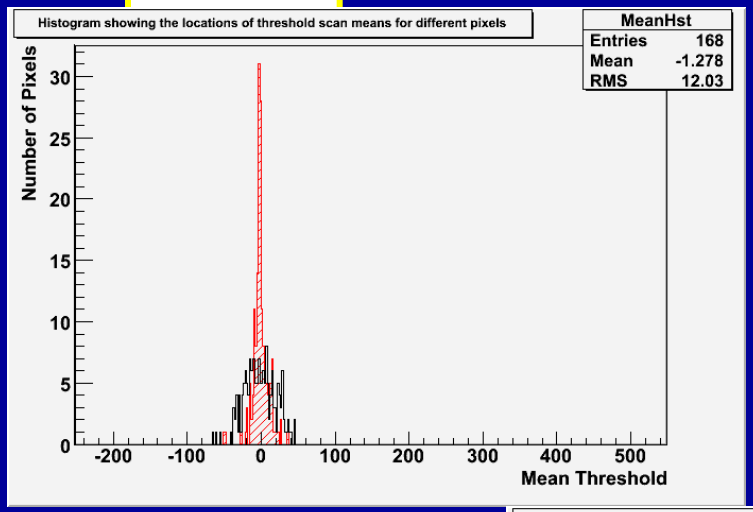
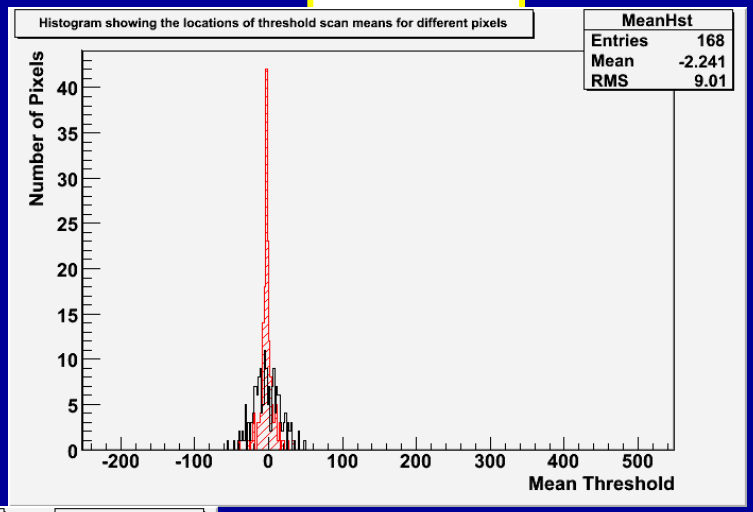
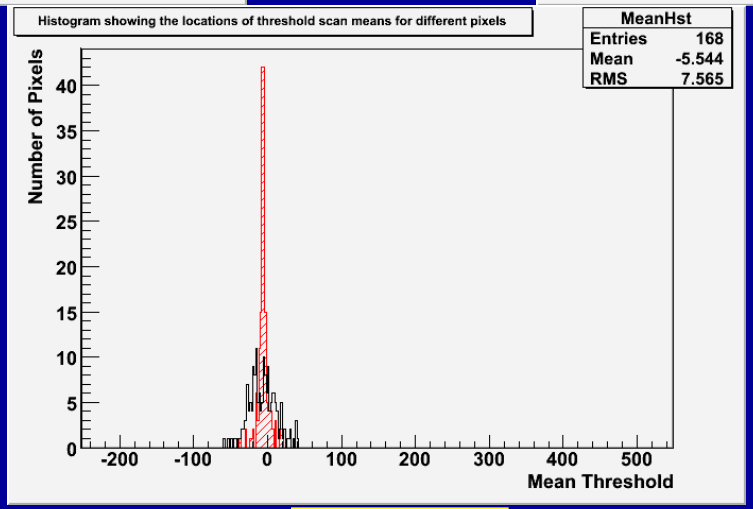
The range of means for pixel threshold scans is reduced when all the pixels are active at the same time:

Column 13



Column 14





Column 40

- All pixels active
- One pixel active at a time

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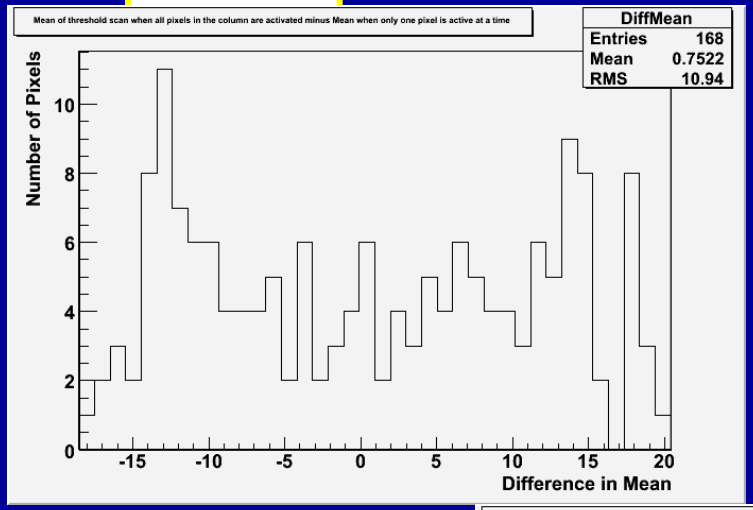
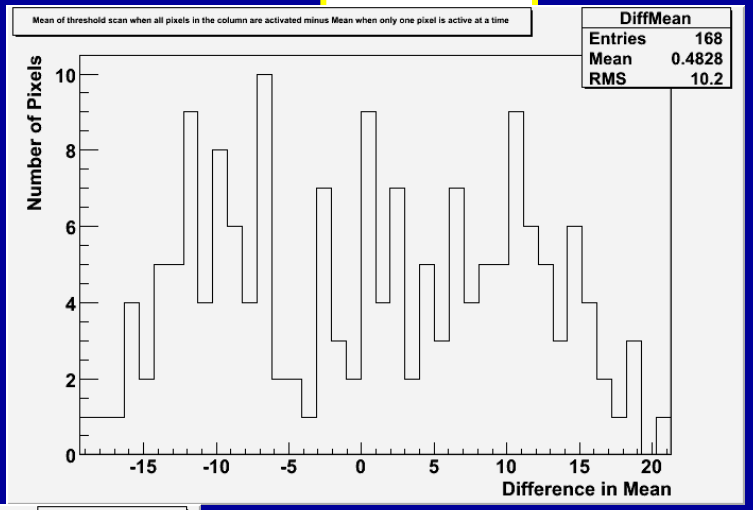
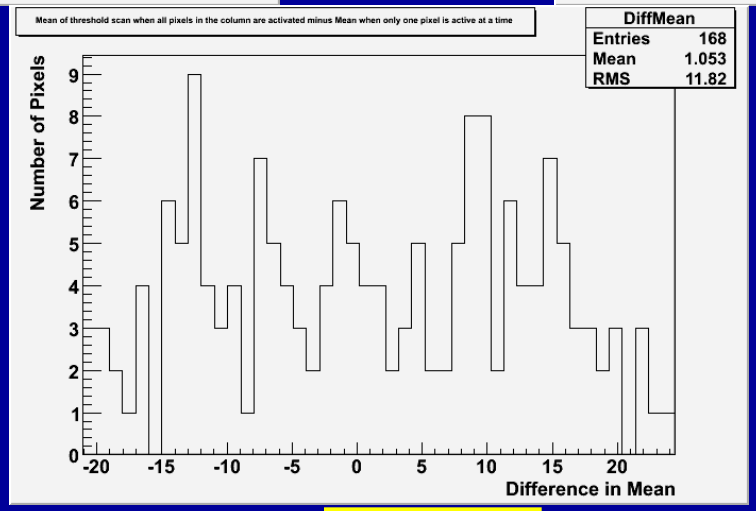
The number of threshold units the pixel threshold scan mean shifts by when all the pixels in a column are on are:

Column 13



Column 14





Column 40

Titles on the histograms read: Mean of threshold scan when all pixels in the column are activated minus Mean when only one pixel is active at a time.

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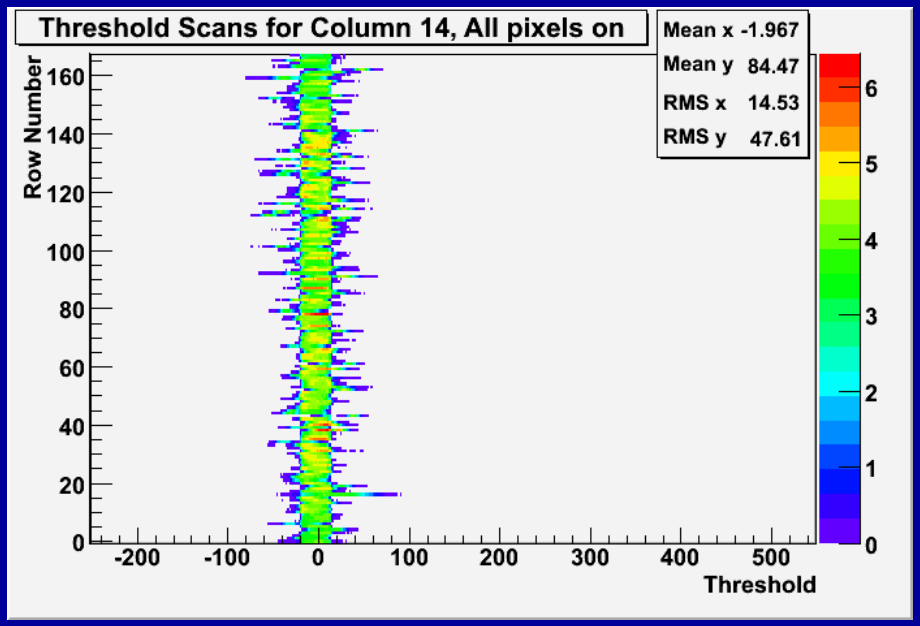
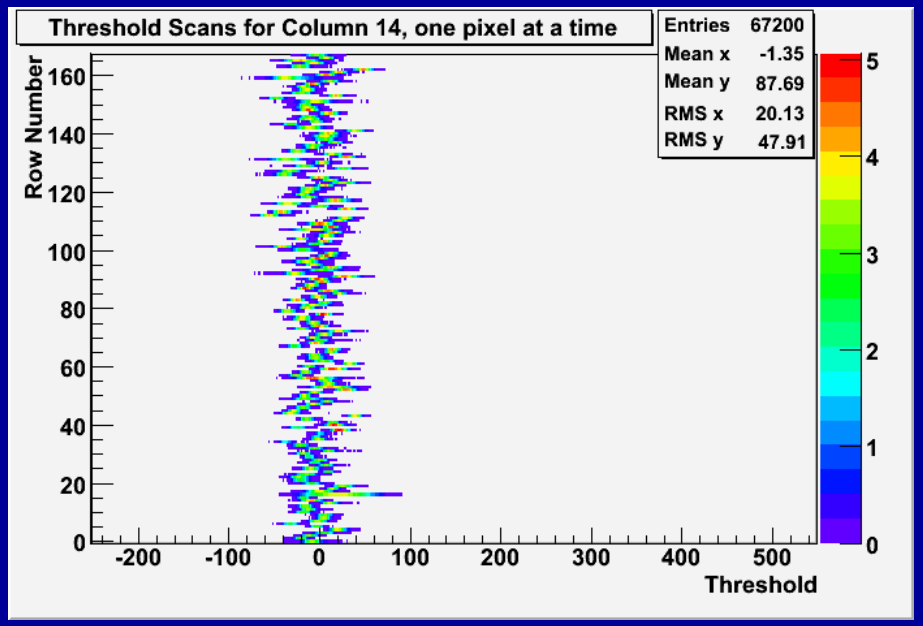
The threshold scans of all the pixels in a column are shown below:

Column 14

All Pixels On

One Pixel on at a time





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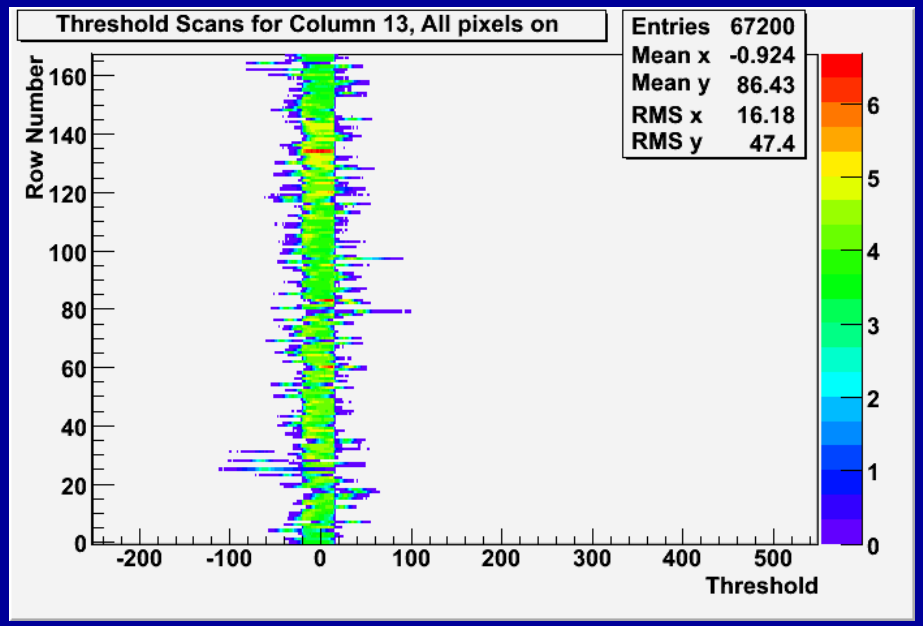
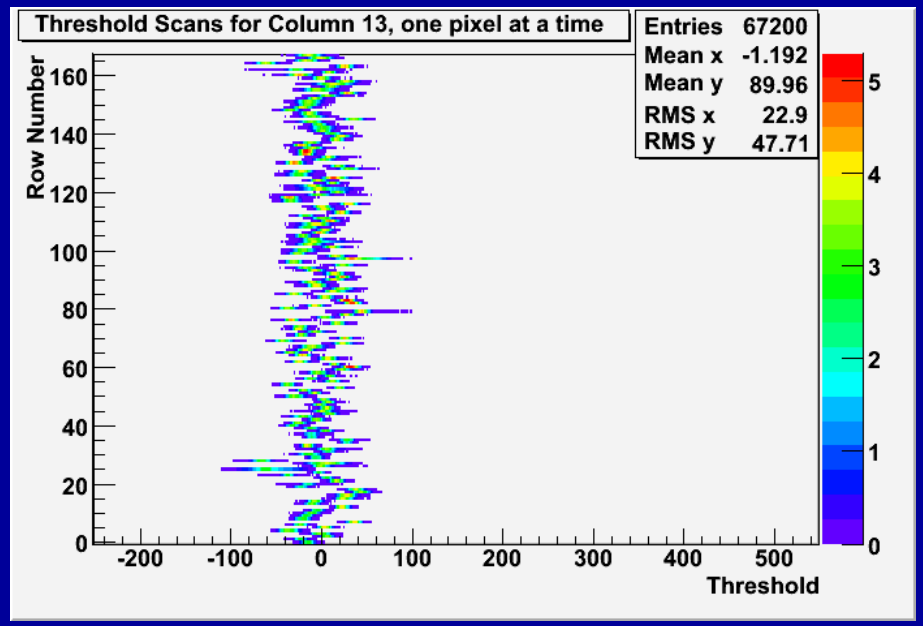
For Column 13:

All Pixels On



One Pixel on at a time



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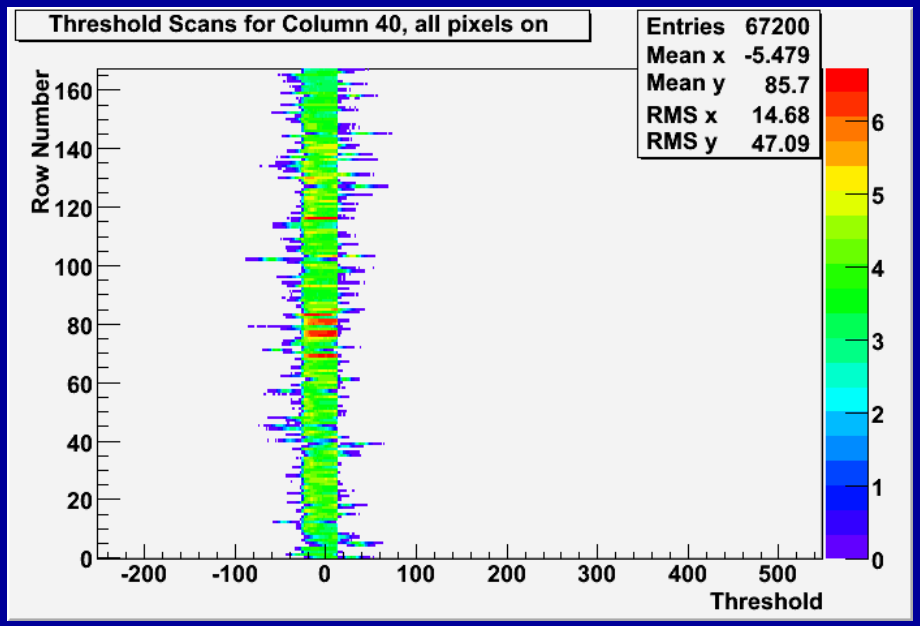
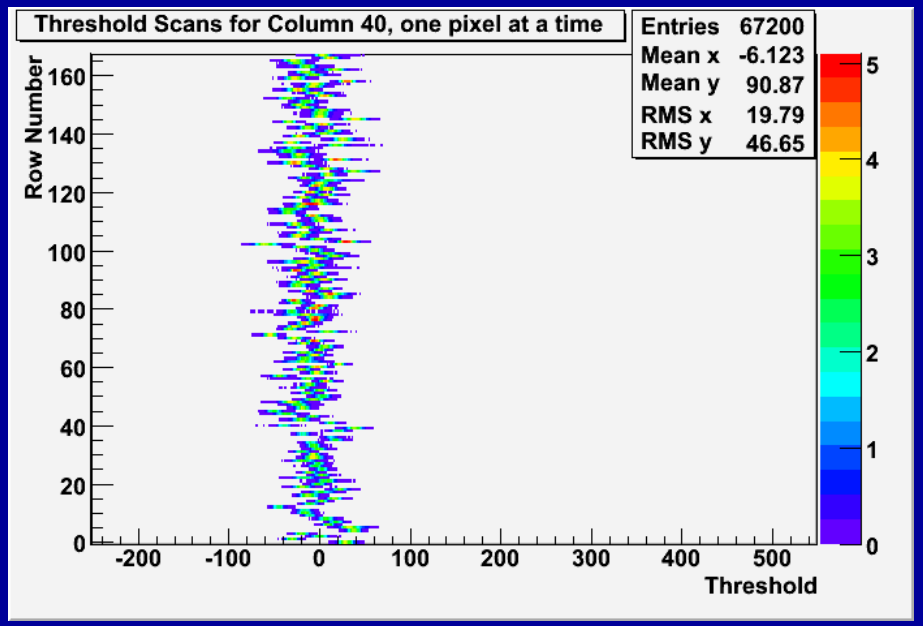
And Column 40:

All Pixels On



One Pixel on at a time



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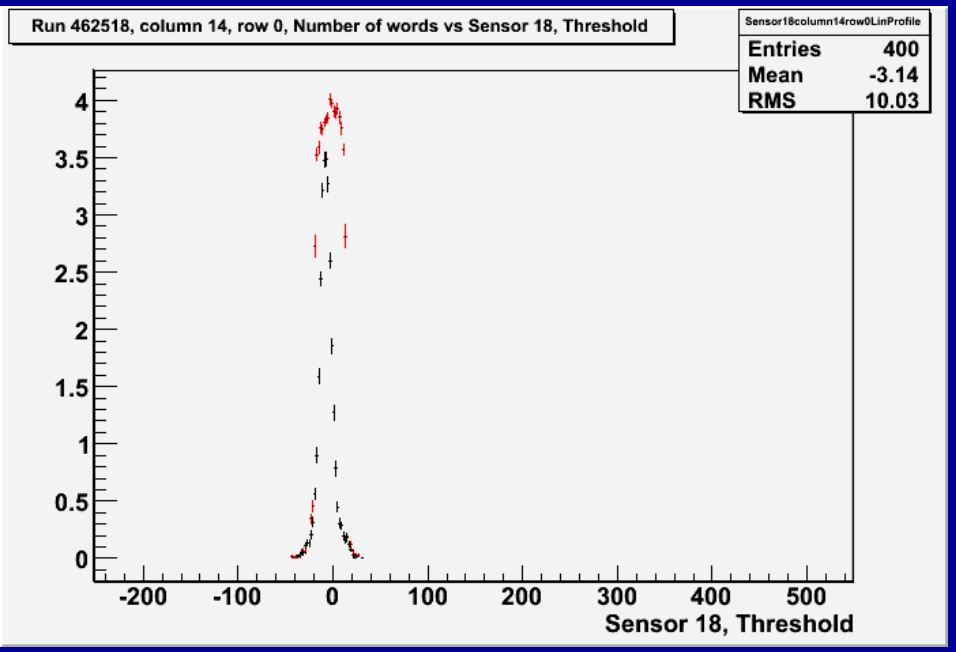
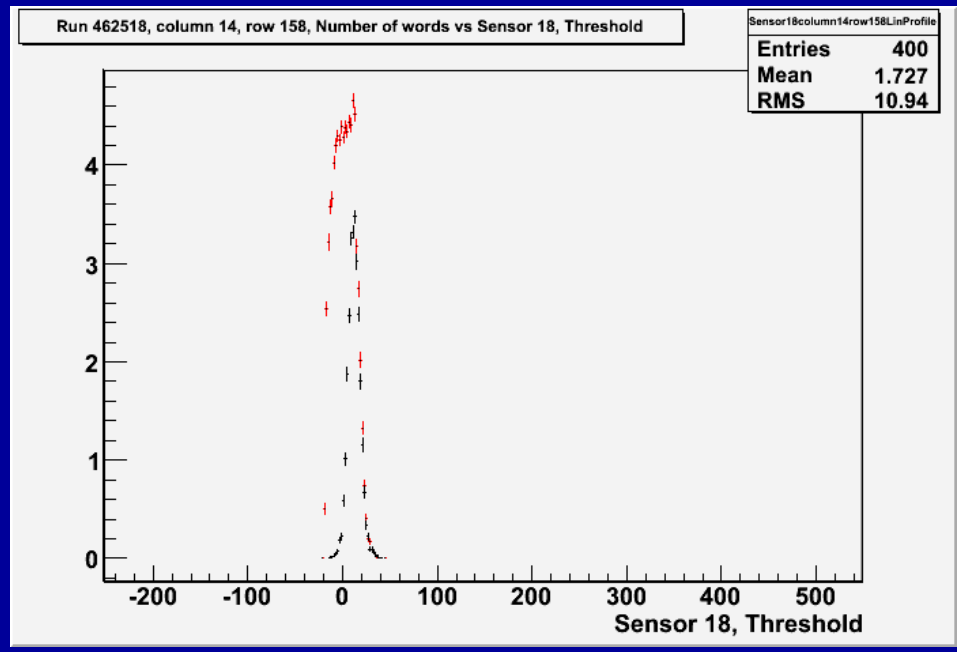
Looking at individual pixel threshold scans we see this:





- All pixels active
- One pixel active at a time

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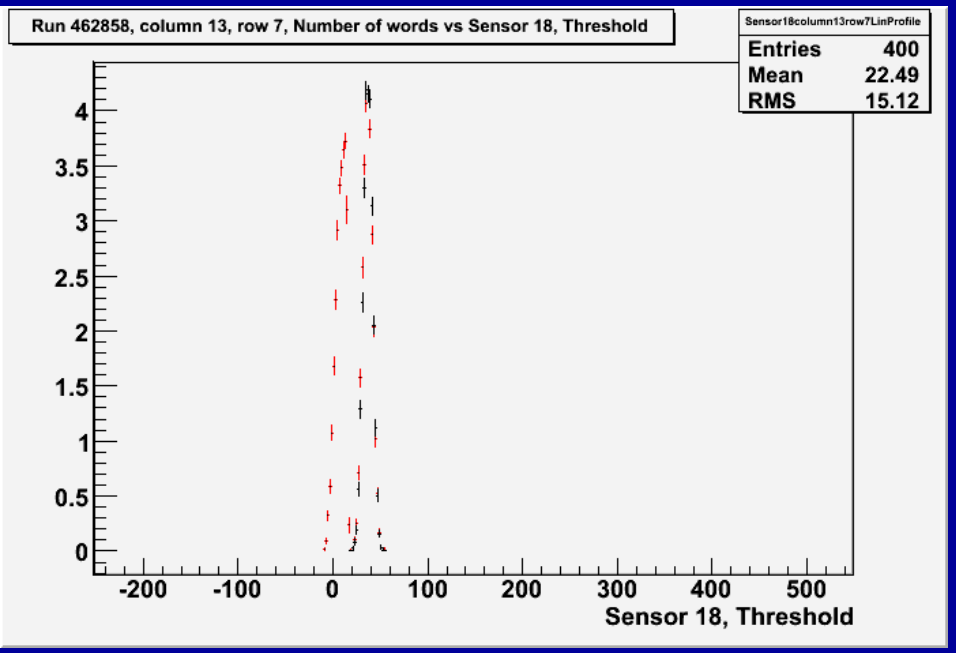
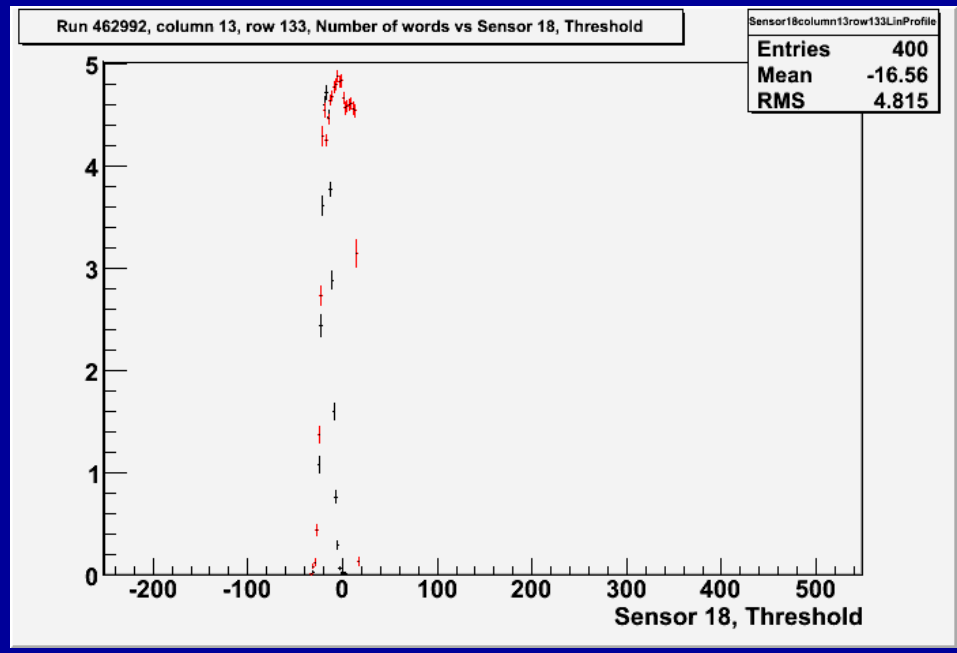
And in column 13:





- All pixels active
- One pixel active at a time

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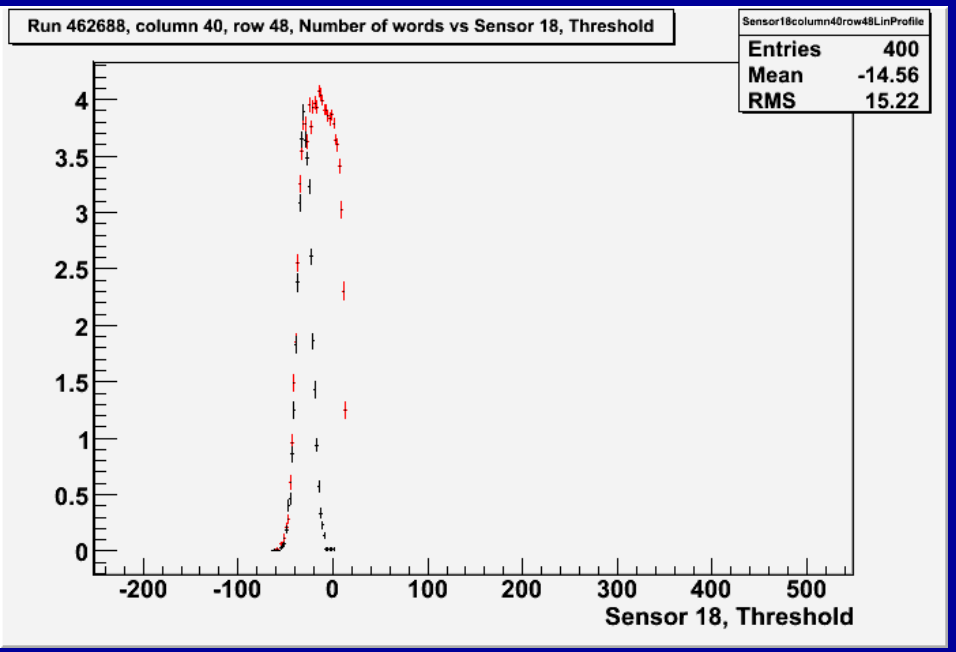
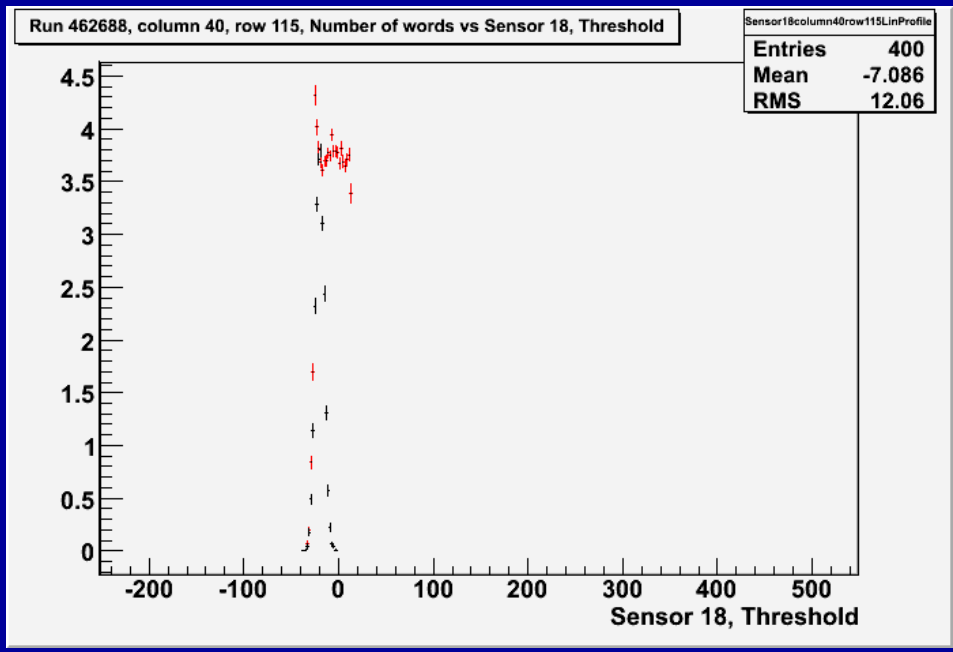
And in column 40:





- All pixels active
- One pixel active at a time

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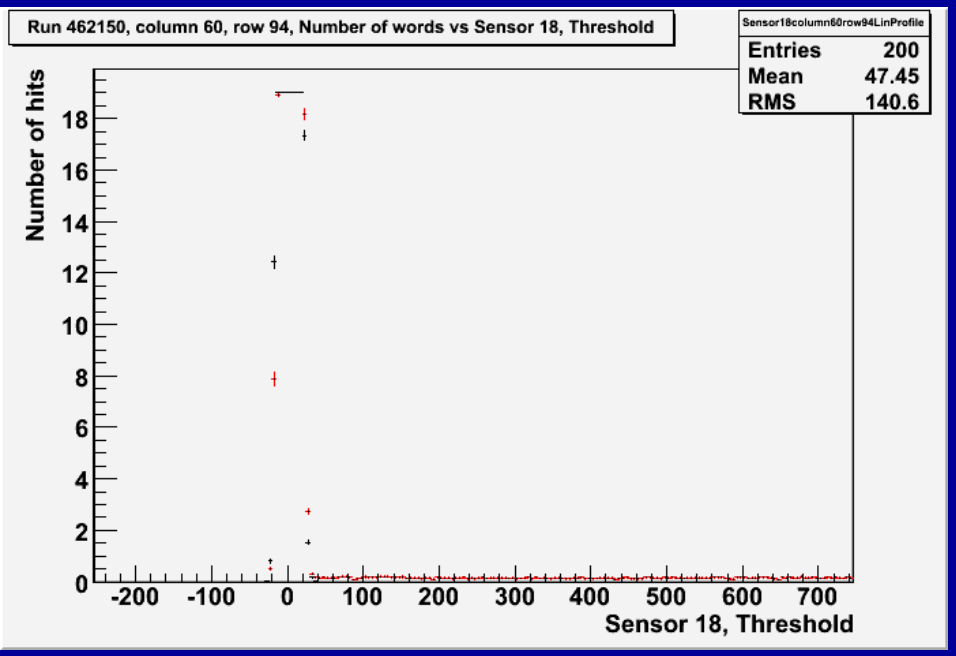
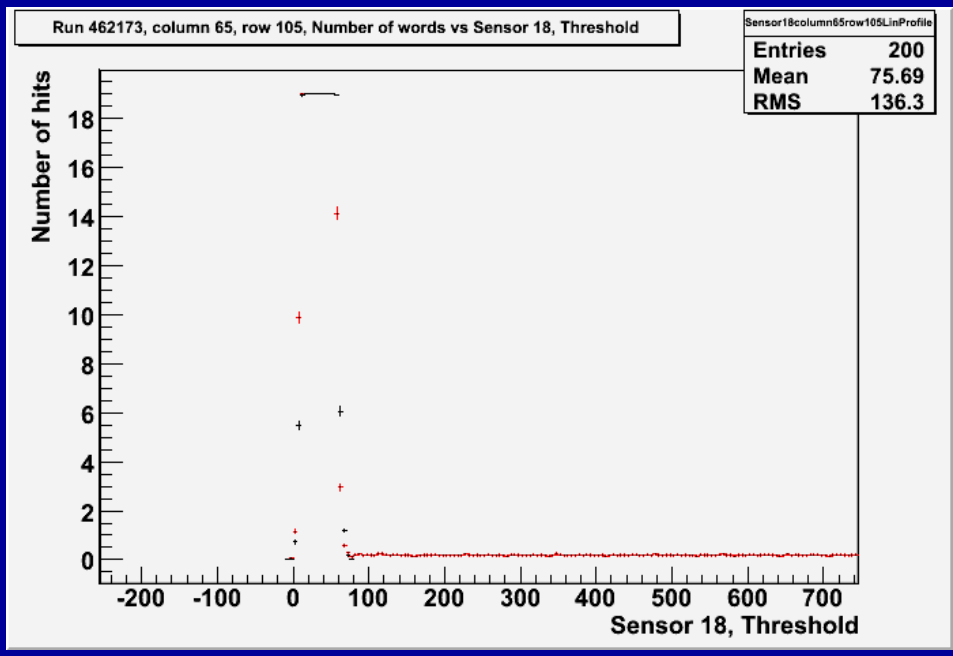
Laser Tests

- We are able to identify laser hits on the sensor.
- If a pixel is registering a laser hit during a threshold scan, then the resulting threshold scan histogram will have a significantly increased standard deviation (relative to pixels not registering laser hits).

The Difference in pixel threshold scans when the pixel is hit by the laser:





- Laser on
- Laser off

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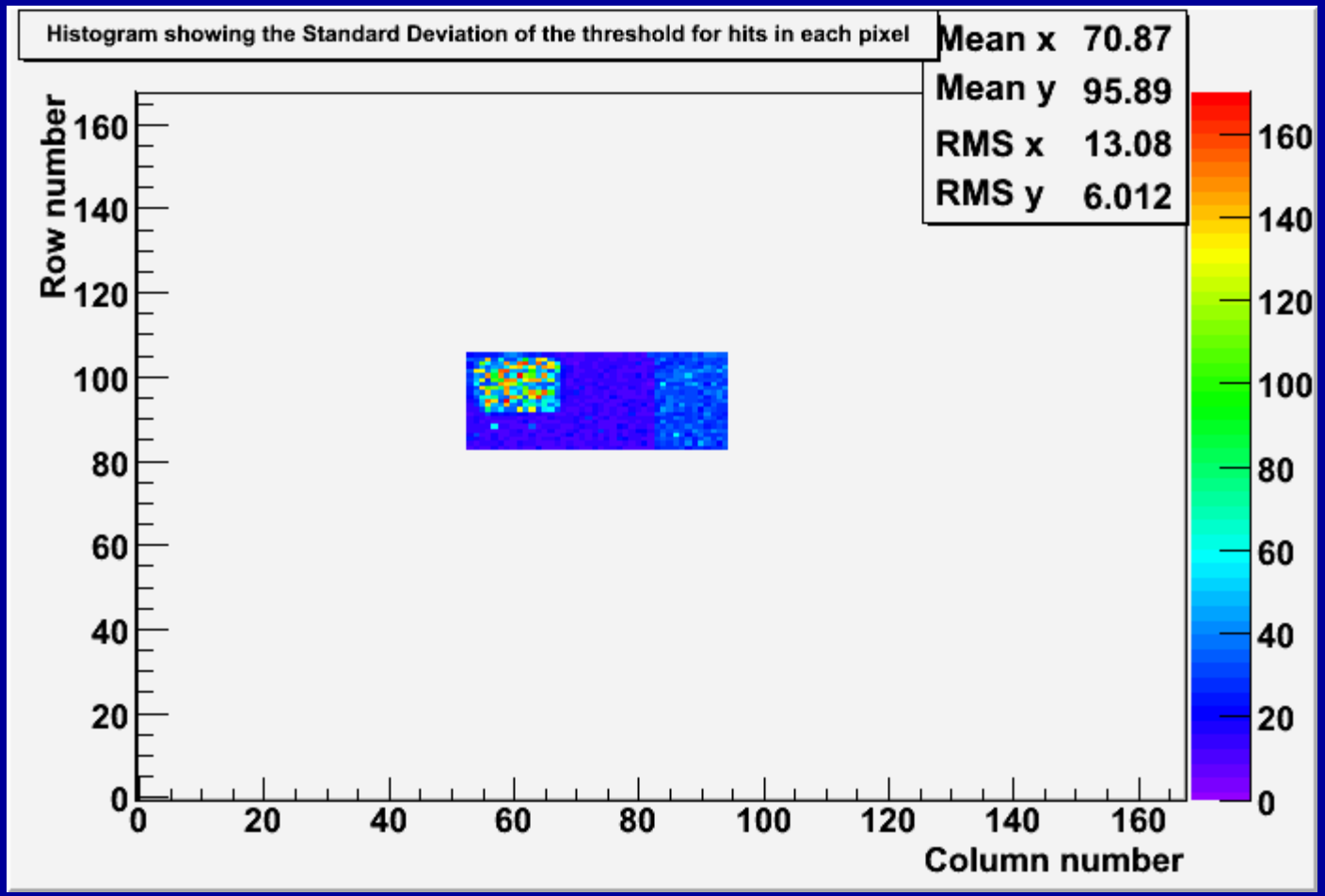
Using the Standard Deviation as a guide, pixels hit by the laser are now clearly identifiable:



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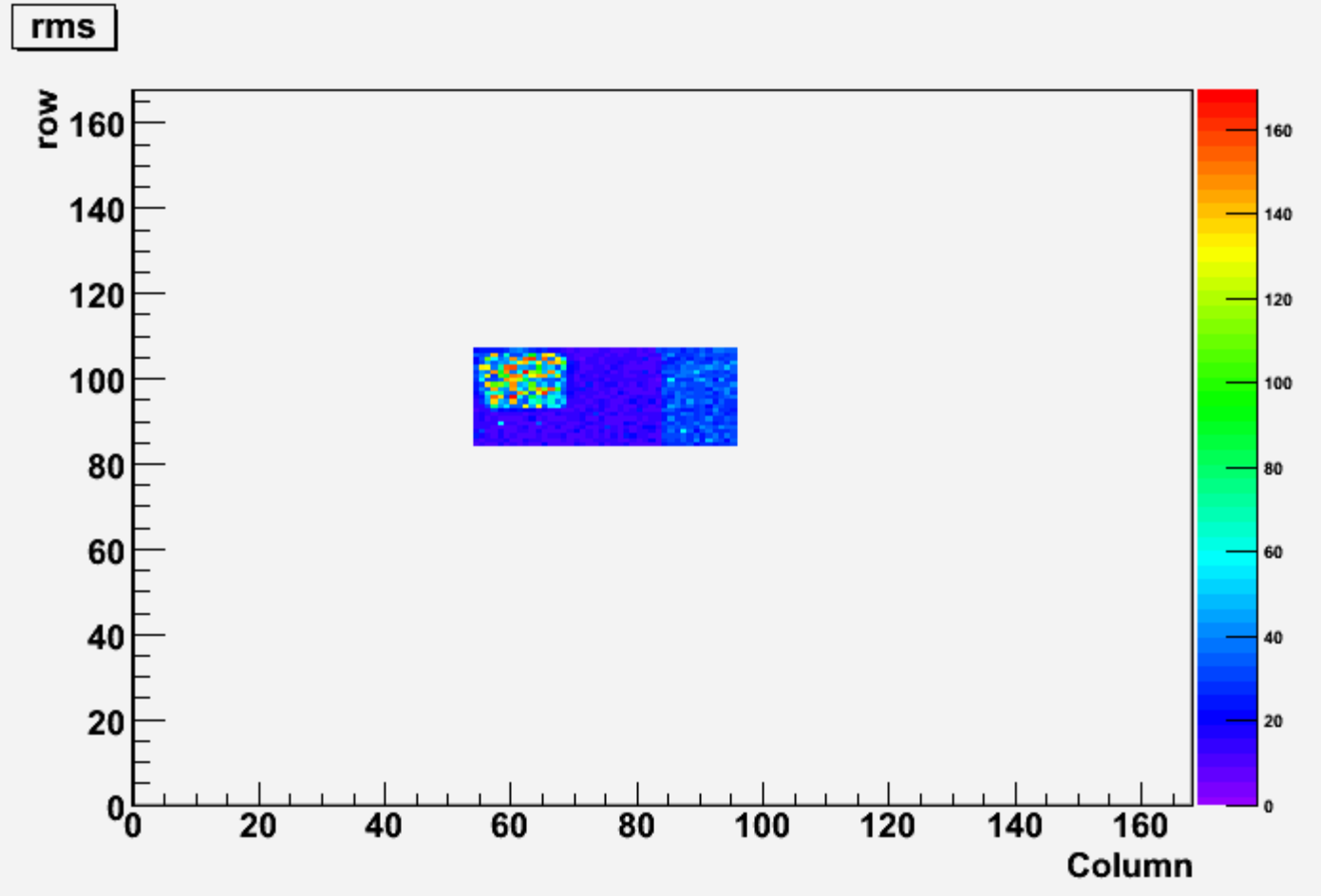
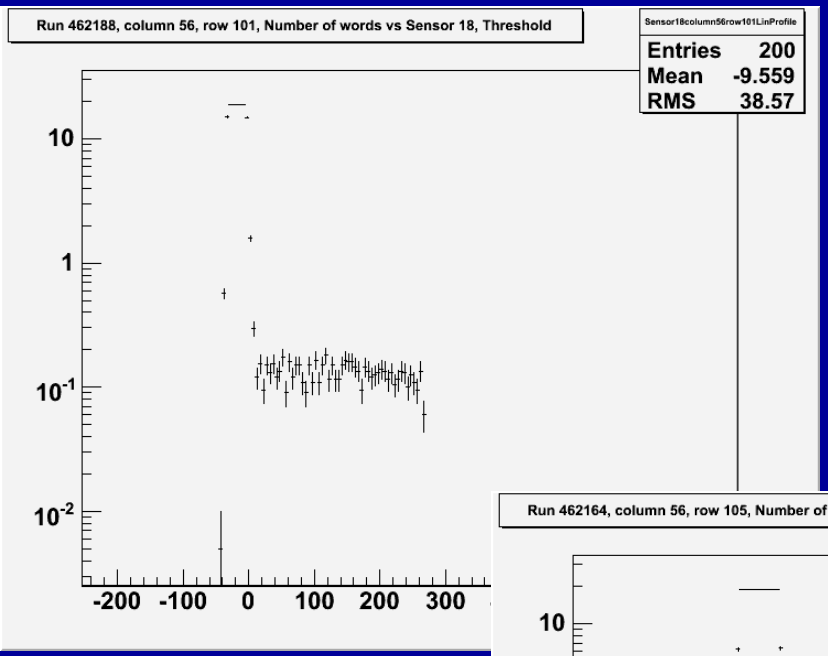
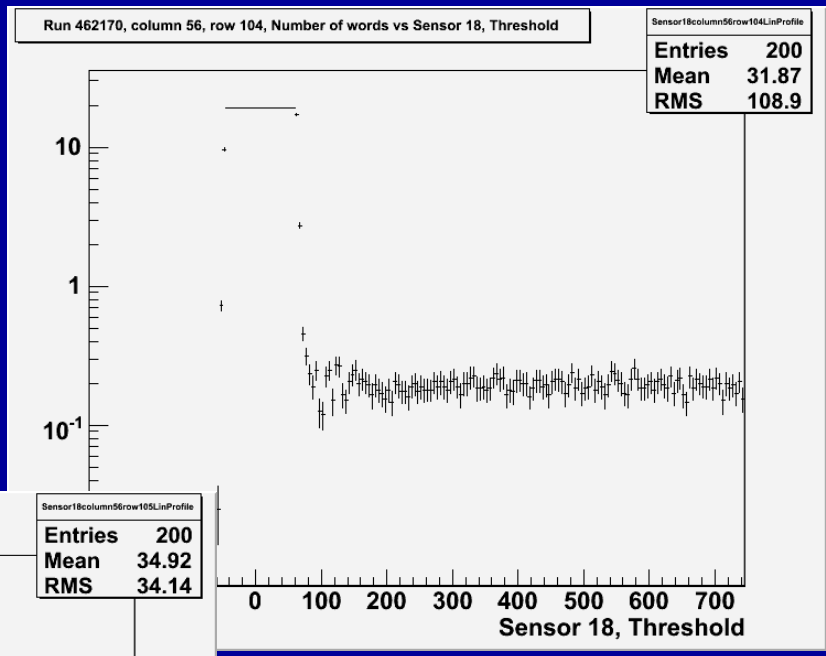
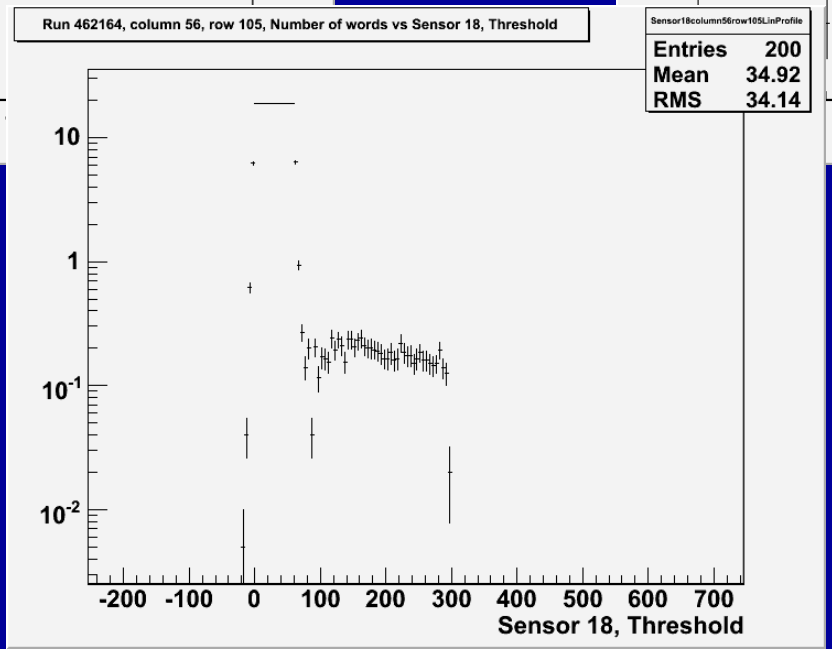
This of Course Gives very similar results to using the Pixel RMS:



A Few More Individual Pixel Threshold scans with the Laser:







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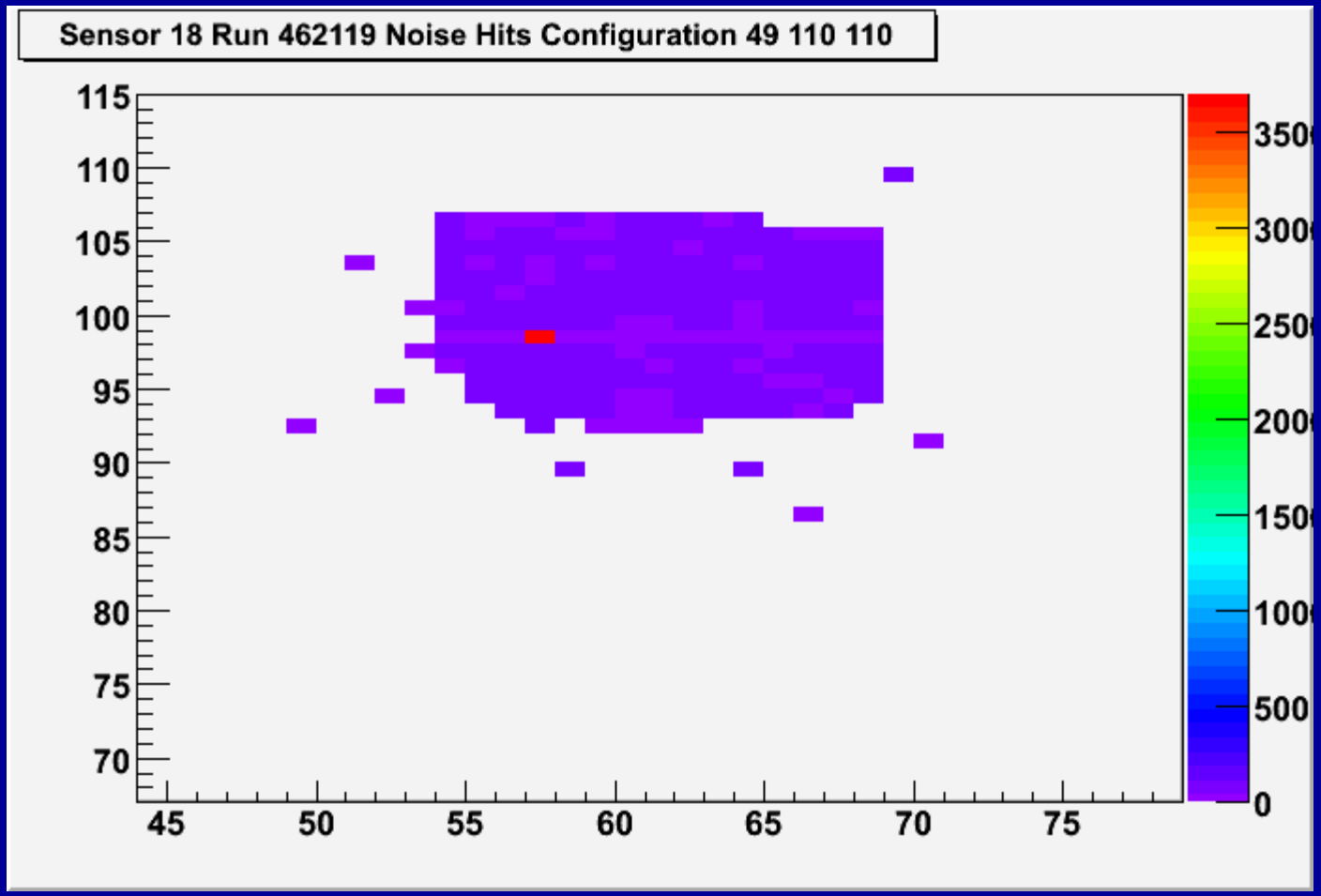
Laser Pilot Run



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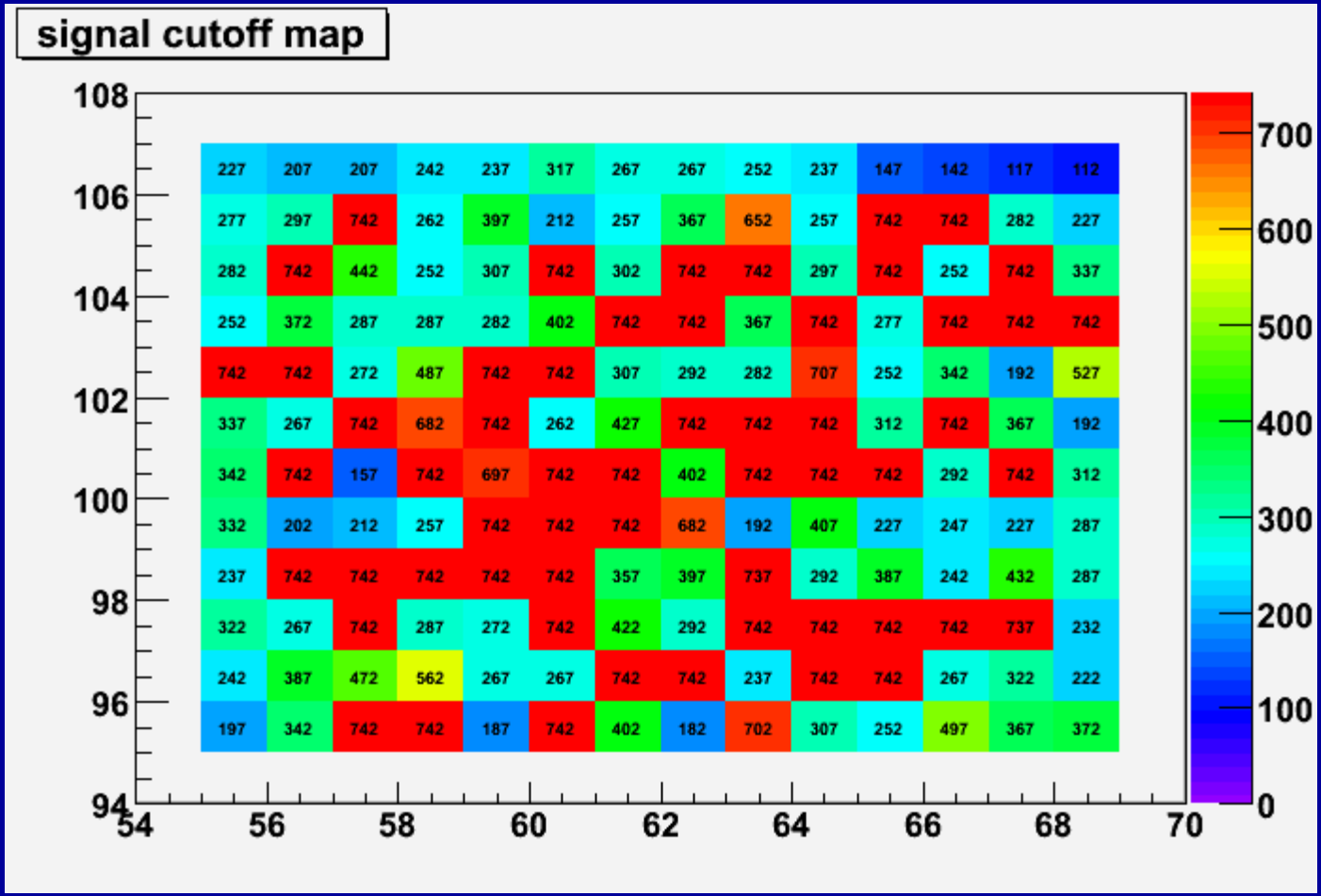
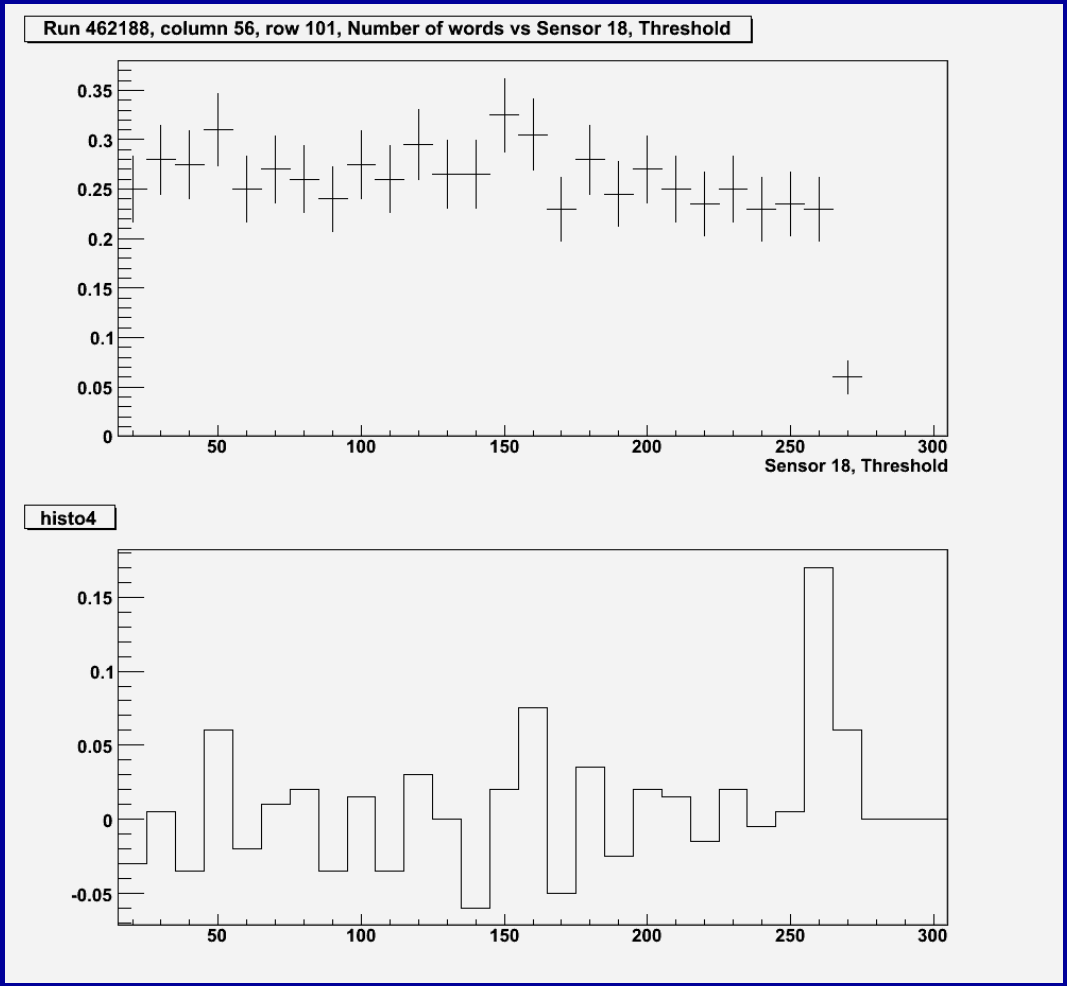
Signal Cutoff Map



A pixel threshold scan (top), and its integral (bottom)



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