

Welcome to 3DMedipix Test beam 2009!

Present: all

17:17 Beam spot size (ellipse) is 4.5 x 6.8 um (FWHM). Uncertainty ~ +/-0.2 um. Gaussian.

18:05 Position of beam instructions from Kawal.

+ve X is horizontally in direction away from control room

+ve Y is upwards

+ve Z is in direction along beam

With respect to **centre** of optics stage, beam position is

X =0.0

Y =+ 35 mm

Z =-27mm

The stage is 70mm long. -27 therefore means (-27=-35+8) 8mm in front of start of stage.

When placing the detector at the optical table the dimensions with respect the frame selected before, which gives the information of the beam are:

X window between 12 and 36

Y window between 1 and 22

Z =-3

18:08 mounting started of device **J03-W0026 MXR3D**.

This is a n-bulk p-type readout, 3D, MXR

n-type required voltages in sensor:

1. 5V

2. 20V

(Vbias in source: same values. Leakage current is low in this sensor so no risk of voltage drop in biasing resistor)

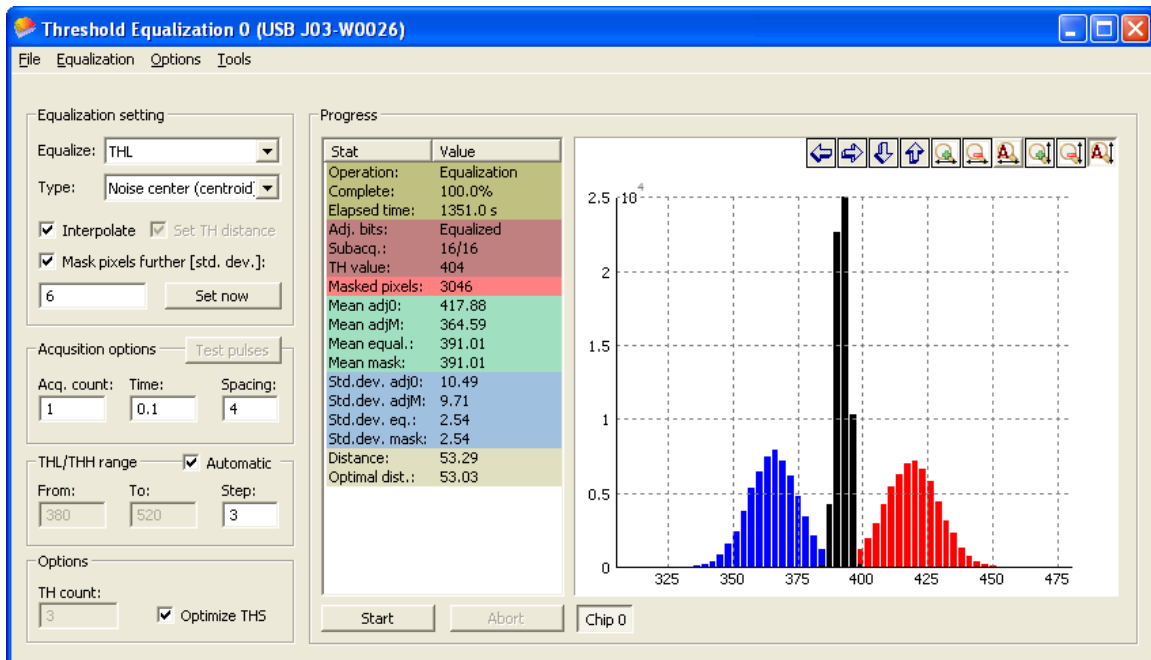
(We'll repeat the tests for the Ptype-MXR with the same voltages)

19.03 Detector is connected correctly. Digital test OK

Vbias is 5V

THL equalization. Same parameters as last year TB. Result histograms in plot below. Noise centroid is in THL= 391

Saved equalization in C:\3DMedipixMay09\day1\J03W26-3DN-THLEqualization.txt



20:00

Dima, Chris leave.

Present: Nicola, Eva, Aaron, Celeste

Moved detector so beam is centered. (Still need to move 3mm in Z so that the beam is focused on the detector surface.

Put some Al foil in beam entry to attenuate the beam.

20:15

Try to image the beam with THL = 350 – SUCCESS!

Pixel (147,149) has 200 counts/ms – risk pileup

(Pixel (148,149) also has some signal.)

Now we try to get the right beam intensity and acquisition time – put more Al foil

20:28

We placed a larger attenuator in the beam line.

Pixel (181,119) has 25,000counts/s – still worried that there will be pulse pile-up and are changing the attenuator

The pixel position has changed as we think we may have bumped the lens.

Check in the morning that the beam * please ignore all the above, we were looking at the wrong pixel.

The pixel is now at position (147,129) and the counts are as before 25,000counts/s

We are taking 0.1s acquisitions

Finally happy with the attenuation. Count rate about 5,000counts/s

Move the stage 3mm in Z. The beam should be focused on the detector now.

*** Remember x and y are swapped by the Medipix preview, so the x dir changes in y on screen and vice versa

21:00 We test the acquisition script.

X-Y movement works OK

BUT: Pixelman doesn't see triggers.

Check hardware. Try with different MPix board- same.

The trigger is working now. Needed to change the offset, as the trigger was above the threshold all the time.

The script (movement-trigger-acq.) works OK now

21:45

Try with Xrays

Pixelman doesn't respond and have to reinstall again

22:00 Eva, Nicola leave.

22:20

2x3 steps scan. Expect 6 acquisitions.

Scan with Xrays.

THL = 350

FBK is default value, 128

1 pixel scan. 5 um steps, 121 acq.,

Saved in: C:\3DMedipixMay09\day1\testing\pixel_test_5umstep_THL350.txt

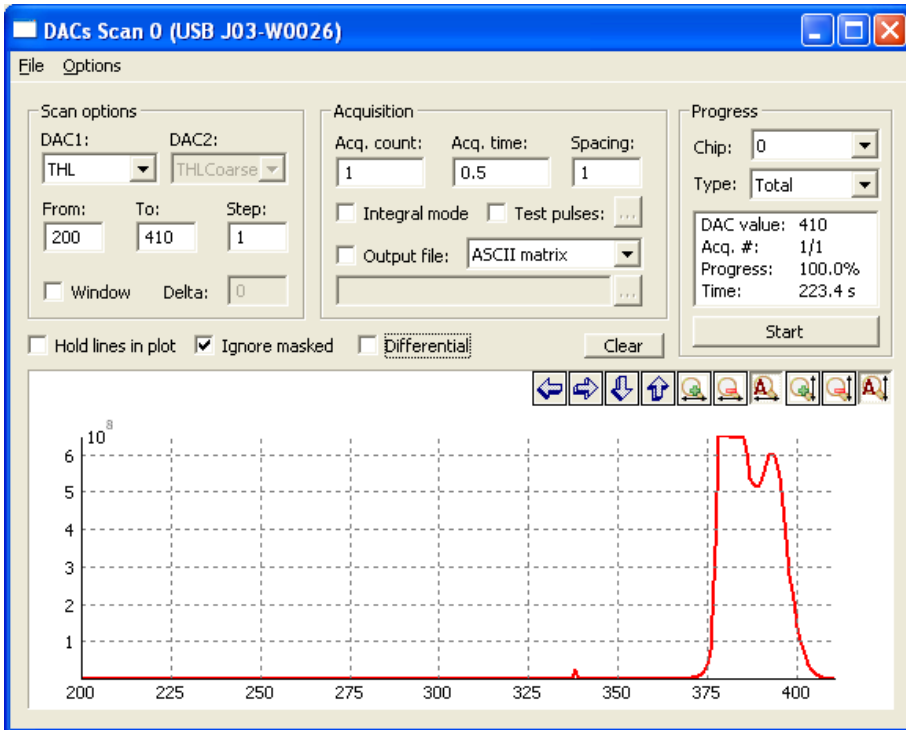
Scan logfile is 12419.dat

23:15.

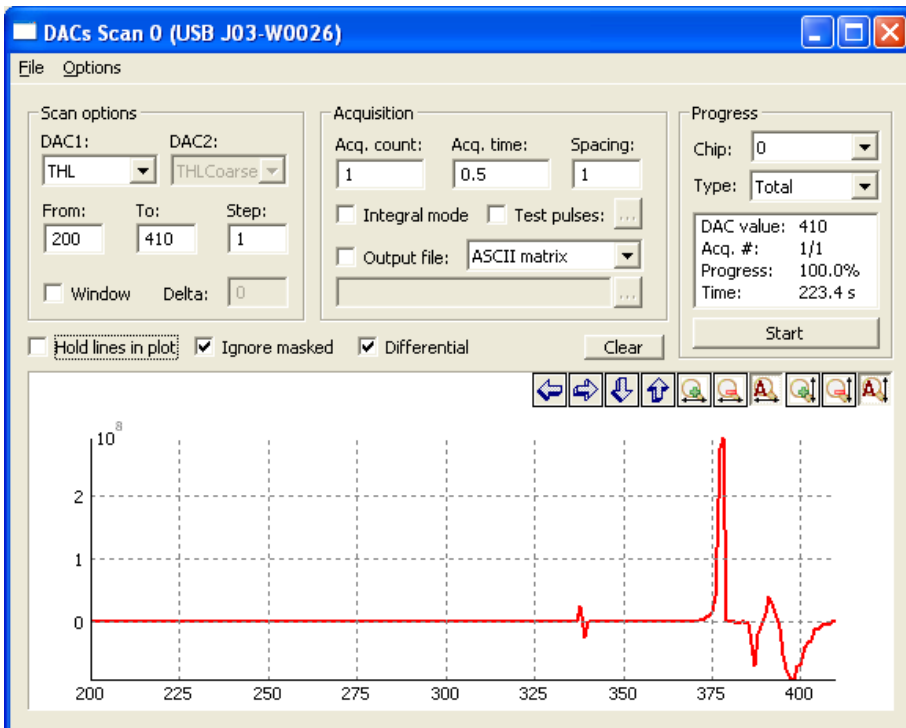
Try threshold scan for energy calibration. We know noise centroid is at THL=391.

From last year TB: noise @ 418, 15 keV @ 330. So if THL vs E ratio is more or less the same, the 15keV peak should be at ~300 now.

Result from THL scan is below:



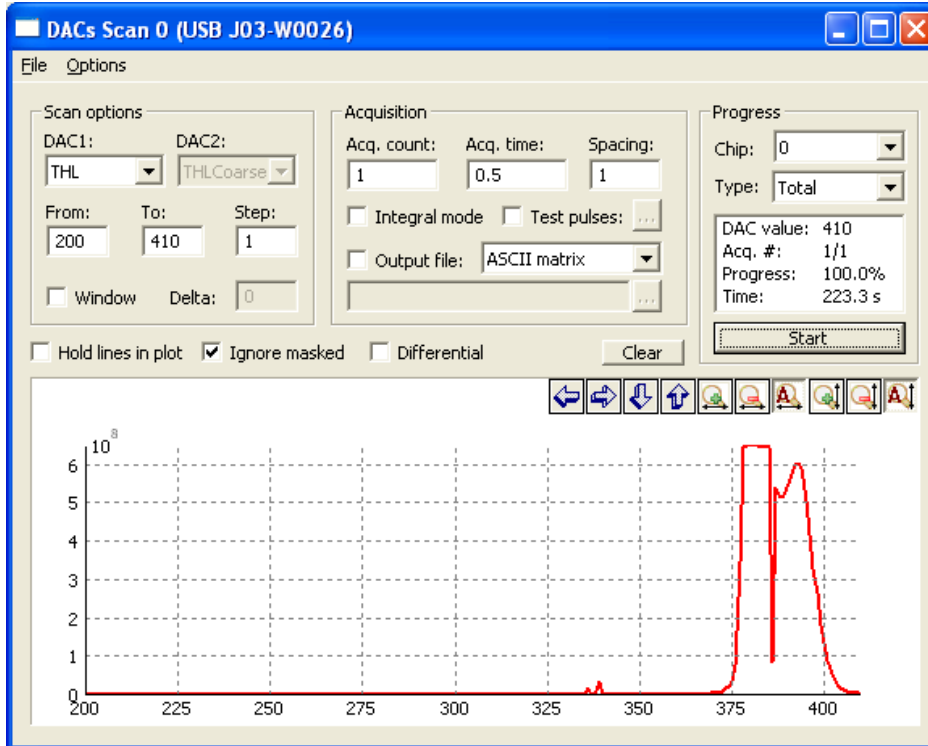
THL scan with 15keV beam



THL scan with 15keV beam, differentiated

Noise looks OK but can't see the 15keV peak – beam too small.

Run again without the beam to see if there's any difference> No difference at all. Plots below:



THL scan without beam



THL scan without beam, differential

Scans saved in J03W26-3DN-THLScan-Xrays.txt and J03W26-3DN-THLScan-noise.txt

23:50

Make a continuous acquisition with XRays changing THL manually to see at which THL the signal disappears in the single pixel.

Up to THL = 340 count rate in this pixel is more or less stable (500-600 / 100ms). At THL310 we have 450 and 300 at THL300, 100 at THL295, 20 at THL290

So the 15keV peak is at about THL300 (rough calculation was ok!) and 1/2 peak energy is ~TLH345

00:25

Take an acquisition without beam, THL345 and mask the noisy pixels.
Result saved in J03W26-3DN-NoisyPixelsMasked.txt.

1:59

Dima & Chris

Turn on beam to check can see pixel.

Observe two highly lit pixels 122,113 and 122,112, so beam has moved.

With acquisition time of 0.1, the beam spot seems wider ?

i.e. more counts in pixels around – counts in pixels 2 away.

Total counts in frame is around 700, previously they had 1100