

EXP1803 - Analyzing #199

Developing # 196 (Открыта): Post-production measurements

Determination of positions of silicone detectors

05/31/2018 10:19 AM - Vratislav Chudoba

Status:	Открыта	Start date:	05/31/2018
Priority:	Высокий	Due date:	
Assignee:	Bahytbek Mauyey	% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:			
Description			
Determine positions of silicon detectors used in post-production measurement of thin detector thickness.			
We take into account that center of the first thin detector is in point (0,0). We need to find the position of thick (1 mm) silicon detector related to the thin detector. For this task we use the data			
mbsdaq@nra161:/LynxOS/mbsusr/mbsdaq/mbsrun/exp201804/data/calib/si_after/si-1_si-20_35cm_0deg_new1_*.lmd			

History

#1 - 05/31/2018 10:27 AM - Vratislav Chudoba

- Tracker changed from Developing to Analyzing
- Description updated
- Assignee set to Bahytbek Mauyey
- Priority changed from Низкий to Высокий

#2 - 06/01/2018 01:19 PM - Bahytbek Mauyey

- File stripe[8;15]_1mmdetector.gif added

We used data file si-1_si-20_35cm_0deg_new1_0003.lmd We took into account that center of the thick 1mm detector is in point (SQY_L[8],SQX_L[15]). We need to find the position of thin (1 micron) silicon detector related to the thick (1mm) detector. We determined position of the first 20-micron detector related to the second 1mm detector in this way:

```
tv__tree->Draw("NeEvent.SQY_L[8]:NeEvent.SQX_L[15]", "", "", 737484, 0);
```

```
stripe%5B8;15%5D_1mmdetector.gif
```

then we used this CUT for all stripes of thin detectors. And it matched only this stripe: tv__tree->Draw("NeEvent.SQY_R[7]","CUT", "")

```
stripe%5B7%5D_1mic_detector.gif
```

Position of the thin detector related the thick detector for X axis is thick(8:15) : thin(7).

#3 - 06/05/2018 06:00 PM - Bahytbek Mauyey

- File positionSQ20mkm_1mm.root added

The active area of thin detector is 50mm:50mm and there are 16 stripes for axis X (from left to right SQY_R[0]->SQY_R[15]). The active area of thick detector is 58mm:58mm and there are 32 stripes for X axis (from left to right SQX_L[0]->SQX_L[31]) and 16 stripes for Y axis (from bottom to top (SQY_L[0]->SQY_L[15]). The coordinate center point (0,0) is thick detector's center.

We changed the channels by mm by following way and wrote new root file with 3 branches(y_1mm - thick detector's Y axis;x_1mm- thick detector's X axis; and x_20mm -thin detector's X axis):

```
if(NeEvent_SQY_L[i]>200 && NeEvent_SQY_L[i]
```

The root file positionSQ20mkm_thick_13.06.18_.root and macros.C and macros.h were attached.

The center coordinate of thin detector for X axis was found following way: The 15th stripe for thick detector(X axis) corresponds to 7th stripe of thin detector.

So the coordinate of 15th stripe for X axis is: $15\text{stripe} \times 58\text{mm}/32\text{stripe} + (58\text{mm}/32\text{stripe})/2 - 29\text{mm} = -0.90625\text{mm}$ (It is also the 7th stripe's coordinate of thin det.)

Here $58\text{mm}/32\text{stripe}$ means the length of 1 stripe. $(58\text{mm}/32\text{stripe})/2$ - half width of stripe; 29mm - half length of thick detector. We took account that center of stripe is center each stripe.

The point of between 7th and 8th stripe of thin detector is center of the thin detector. So center coordinate is 7th stripe+half width of stripe:
 $-0.90625\text{mm} + (50\text{mm}/16)/2 = -0.90625\text{mm} + 1.5625\text{mm} = 0.65625\text{mm}$

But the coordinate of thin detector's center for Y axis might find only by shadow in thick detector. We know that the length of detector is 50mm and we can notice the greasy places in the thick detector . We only can found approximately and it equal about - 3 mm.

SQ1mm_centers_13.06.png

THE COORDINATES OF THIN DETECTOR'S CENTER RELATED CENTER OF THICK DETECTOR ARE $X=0.625\text{MM}$ and $Y=-3\text{MM}(+-0.5\text{mm})$

- File macros.C added
- File macros.h added

The script for determine position of detectors:

#5 - 06/14/2018 03:21 AM - Bahytbek Mauey

- File deleted (macros.C)

#6 - 06/14/2018 04:04 AM - Bahytbek Mauey

- File macros.C added
- File macros.h added
- File positionSQ20mkm_thick_13.06.18_.root added

#7 - 06/25/2018 03:02 PM - Bahytbek Mauey

- File 22.06.root added
- File 22.06_x20_x_1.root added
- File 22.06_x20_y_1_3D.root added

The orientation thin detector in the thick detector with taking into account possible errors. The center points of thin detector are $1 \pm 1.375\text{mm}$ for X axis and $-1.8125 \pm 2.1875\text{mm}$ for Y axis relatively center of thick detector. The stripe widths were taken into account and equal to $58\text{ mm} / 32 = 1,8125\text{ mm}$ (X axis of thick detector), $58\text{ mm} / 16 = 3,625\text{ mm}$ (Y axis of thick detector) and $50\text{ mm} / 16 = 3,125\text{ mm}$ (X axis of thin detector). Also the position of 7th stripe of thin detector corresponding to 15th stripe of X axis thick detector was taken into account. We can see from picture that the maximum size that the thin detector can replace in the thick detector is $52.5625\text{mm}:54.375\text{mm}$ (x:y). But the real size is $50\text{mm}:50\text{mm}$. So possible orientation can be determine with errors 1.375mm (for X axis)and 2.1875mm (for Y axis)

25.06_1.png

3D histogram of thick detector(X:Y:

25.06_1mm-1mm_1.png

Files

stripe[8;15]_1mmdetector.gif	25.1 KB	06/01/2018	Bahytbek Mauey
positionSQ20mkm_1mm.root	2.75 MB	06/05/2018	Bahytbek Mauey
macros.h	10.6 KB	06/05/2018	Bahytbek Mauey
macros.C	2.65 KB	06/14/2018	Bahytbek Mauey
macros.h	10.6 KB	06/14/2018	Bahytbek Mauey
positionSQ20mkm_thick_13.06.18_.root	2.56 MB	06/14/2018	Bahytbek Mauey
22.06.root	16.1 KB	06/25/2018	Bahytbek Mauey
22.06_x20_x_1.root	16.3 KB	06/25/2018	Bahytbek Mauey
22.06_x20_y_1_3D.root	15.6 KB	06/25/2018	Bahytbek Mauey