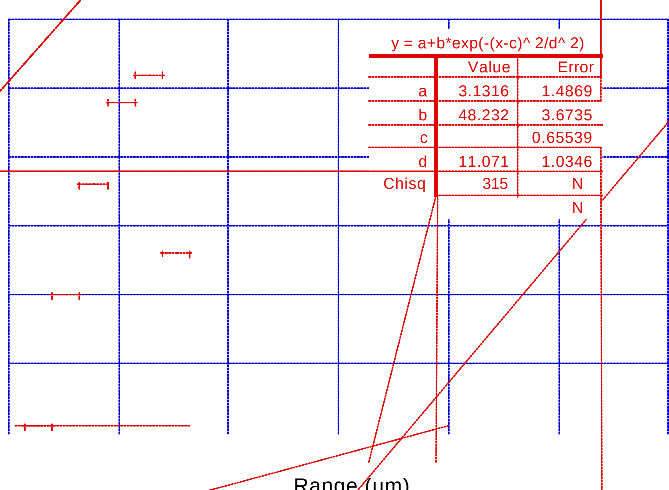
The first step in analyzing construction of the trays was to find the alignment of the individual detectors within the ladder. A straight line was calculated for each side of each ladder (Fig 2).

(Fig 2)

These lines were calculated using the method of least squares fitting in MS Excel. Using the equations for these lines an ideal location in Y was calculated for each measured value if X. The difference between actual and ideal values of Y was calculated; for each line the maximum – minimum deviation was calculated and recorded as the straightness of the line (Table 1). In table 1 the tray name has a B suffix for the bottom plane of silicon and a T suffix for the top plane of silicon. Each delta column represents the average deviation of the measured points from the ideal best-fit straight line. If a tray contains five ladders then there should be ten total lines, due to size constraints only nine could be measured. If a tray consists of four ladders then there are eight delta columns, three ladders have six columns. The results are plotted in Fig 3. The abscissa contains the number of lines within a certain straightness range. A Gaussian fit is applied yielding an average misalignment of 22 ± 11 μm, with eight out of 244 lines having a misalignment greater than 60 μm. The normalized χ^2 value is 1.3, showing this is a reasonable fit.



The second step involved checking the alignment of the ladders within the tray. A reference line, for both the top and bottom of the tray, was calculated using two dowel pin holes on the tray. Using the two lines per ladder calculated in step one an average line was constructed. This gives one line that describes each ladder (Fig 4).

sometime during measuring (Table 3). 6lxcluding the trays that moved the ladder misalignment is 33 ± 22 μm (Fig 6). The normalized χ^2 is 0.1.

(Fig 6)

The third step in analysis was to determine the distance between the planes of silicon on the same tray. The top and bottom could not be measured at the same time, so the distance had to be calculated.

1) The distance from the silicon to the granite plate was measured as well as the distance from the cornerposts to the granite plate.
2) The difference in the two measurements in (1) can be attributed to lead thickness, glue thickness and kapton thickness. The details can be seen in Fig 7.

(Fig 7)

3) Using this diagram and measured values for the height of silicon and height of cornerposts an average value of the glue gap was calculated: 40 μm (Table 4). Taking the difference in height from the top of the silicon to the top of the cornerpost, then subtracting the known values from Fig 7, leaving only the glue gaps as a free variable, found the total thickness of glue.

this value by the number of glue gaps in the calculation give an average glue gap per tray. All of these values were averaged t

Tray	***Delta 1***	***Delta 2***	***Delta 3***	***Delta 4***	***Delta 5***	***Delta 6***	***Delta 7***	***Delta 8***	***Delta 9***
T03B	0.043	0.025	0.037	0.037	0.032	0.021	0.029	0.057	
T03T	0.013	0.022	0.025	0.021	0.012	0.015			
T04B	0.026	0.019	0.029	0.034	0.021	0.017			
T05B	0.022	0.022	0.031	0.032	0.016	0.016			
T05T	0.025	0.022	0.014	0.023	0.015	0.015			
T06B	0.024	0.015	0.026	0.024	0.036	0.037			
T06T	0.035	0.036	0.016	0.019	0.030	0.027			
T07B	0.016	0.012	0.042	0.040	0.020	0.040			
T07T	0.011	0.016	0.019	0.020	0.045	0.046			
T08B	0.022	0.031	0.014	0.017	0.030	0.020			
T08T	0.028	0.023	0.031	0.033	0.030	0.034			
T09B	0.016	0.009	0.028	0.023	0.017	0.016	0.031	0.028	0.023
T09T	0.020	0.016	0.023	0.016	0.012	0.011	0.016	0.008	
T10B	0.015	0.018	0.005	0.011	0.017	0.022	0.054	0.046	0.031
T10T	0.016	0.018	0.022	0.023	0.015	0.015	0.019	0.021	0.012
T12B	0.023	0.030	0.008	0.007	0.031	0.030	0.025	0.025	0.008
T12T	0.016	0.016 TD (0.017) Tj 48 0 TDl926 Tj 48 0 TD (0.008) 55 TD (0.021) Tj 48 0 TD (0.012) Tj -431.4 - 10.2							
	0.030	0.016	0.026	0.024		0.016			

Tray	*Move X*	*Move Y*	*Move Z*
T03B	-0.169	0.064	41.59
T03T	-0.001	-0.124	41.45
T04B	-0.062	-0.044	41.49
T05B	0.005	-0.049	

T 0

Block	kapton	SSD	Pb	spacer	carbon	Average glue
This is between the granite table and the Al core.						*calculated value by averaging all calculated glue thicknesses below*
12.78	*0.15*	*0.40*	*0.20*	*0.05*	*0.10*	*0.04*

Type ***Tray*** ***Silicon Zcal6*** ***0***

Plane	Tray position	closeout ID	Tray type	tray side	ladder type	ladder pos	ladder #	slope	intercept	Z	Z

Plane	Tray position	closeout ID	Tray type	tray side	ladder type	ladder pos	ladder #	slope	intercept	Z	With respect to bottom Z