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SCT Week Dec., 2000
at CERN

SCT BARREL MODULE SURVEY AT KEK

ATLAS Japan SCT Group

-The latest two electrical modules;

New base board (wide nose)
Two step gluing

-3D Measuring microscope:
Mitsutoyo Quick Vision Pro250
Fully automated with image processing

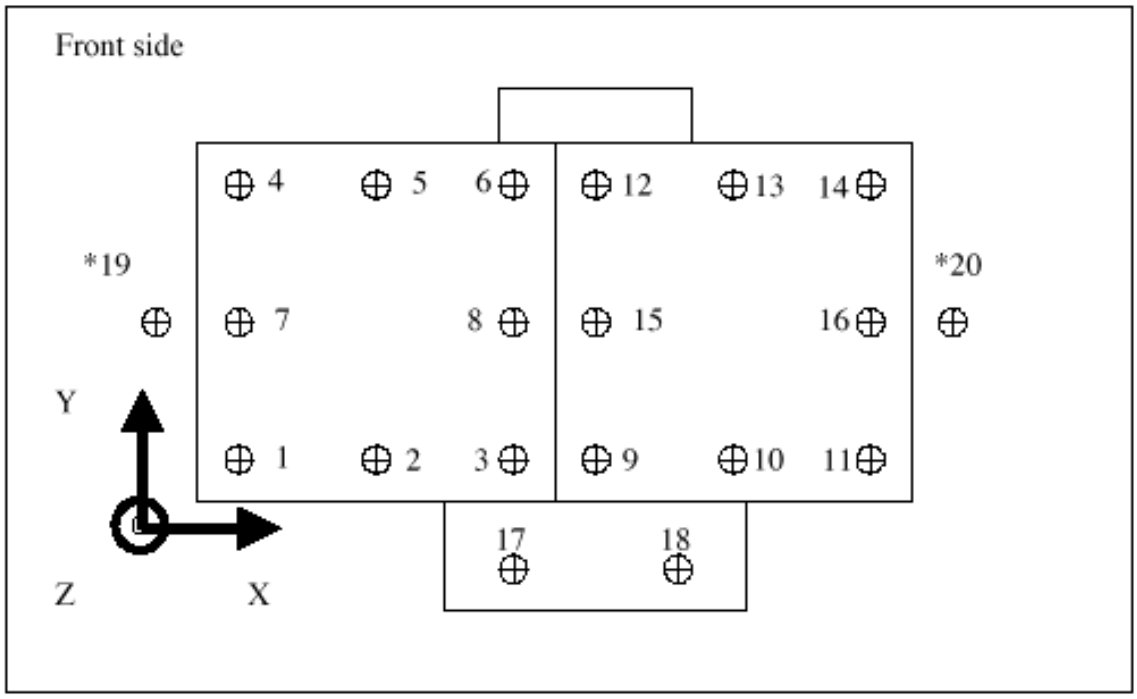
(a)

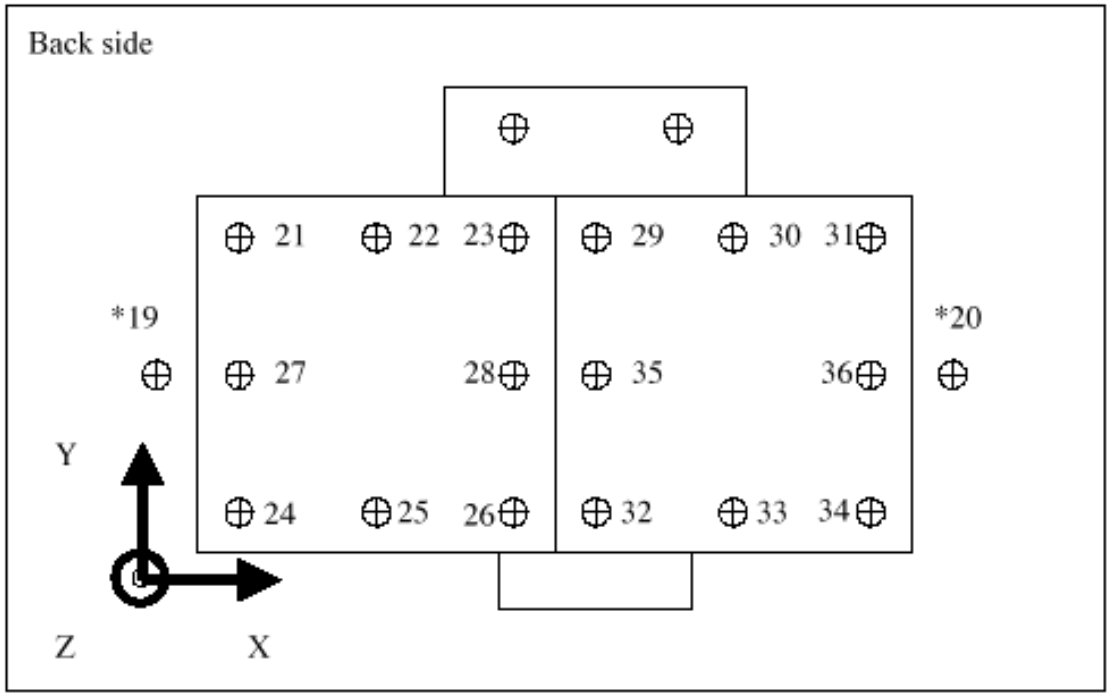
(b)

Fig 1. (a) Quick Vision and DAQ PC, (b) The stage of Quick Vision

X-Y Survey

Measured points





*Points 19,20 are transparent fiducials.

Module 1 results;

Parameter	Module type-Barrel	Tolerance	0170200003 Module	Deviation
mhx	-6.5mm	30um	-6.499mm	0.889um
mhy	-37.0mm	30um	-36.995mm	5.498um
msx	38.5mm	100um	38.432mm	-67.567um
msy	-37.0mm	30um	-37.012mm	-12.007um
midxf	0.0mm	10um	-0.002mm	-2.325um
midyf	0.0mm	5um	0.002mm	2.135um
sepf	64.09mm	10um	64.088mm	2.100um
sepb	64.09mm	10um	64.088mm	1.600um
A1	0.000rad	0.13mrad	0.000rad	-0.051mrad
A2	0.000rad	0.13mrad	0.000rad	0.049mrad
A3	0.000rad	0.13mrad	0.000rad	-0.014mrad
A4	0.000rad	0.13mrad	0.000rad	0.016mrad
stereo	0.02000rad	0.13mrad	0.020rad	0.003mrad

Module 2 results;

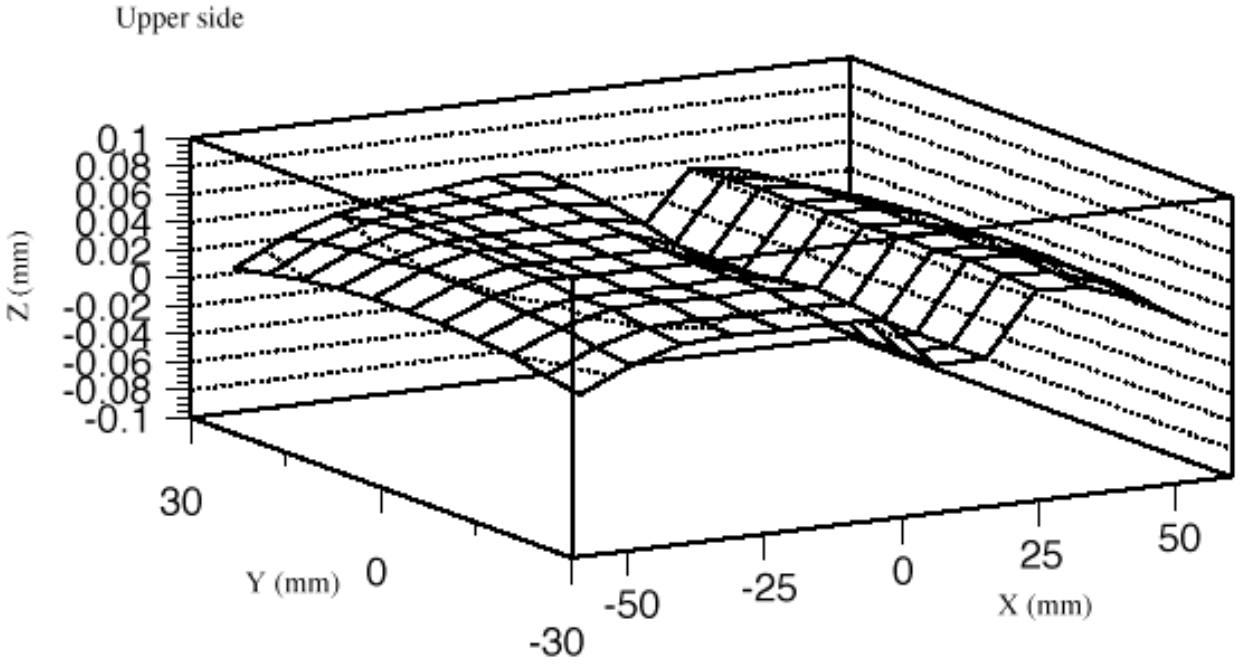
Parameter	Module type-Barrel	Tolerance	0170200022 Module	Deviation
mhx	-6.5mm	30um	-6.495mm	5.172um
mhy	-37.0mm	30um	-36.991mm	9.199um
msx	38.5mm	100um	38.442mm	-58.075um
msy	-37.0mm	30um	-37.003mm	-3.378um
midxf	0.0mm	10um	0.002mm	1.705um
midyf	0.0mm	5um	-0.001mm	-1.195um
sepf	64.09mm	10um	64.088mm	2.500um
sepb	64.09mm	10um	64.087mm	3.500um
A1	0.000rad	0.13mrad	0.000rad	-0.020mrad
A2	0.000rad	0.13mrad	0.000rad	-0.036mrad
A3	0.000rad	0.13mrad	0.000rad	0.020mrad
A4	0.000rad	0.13mrad	0.000rad	0.020mrad
stereo	0.02000rad	0.13mrad	0.020rad	0.020mrad

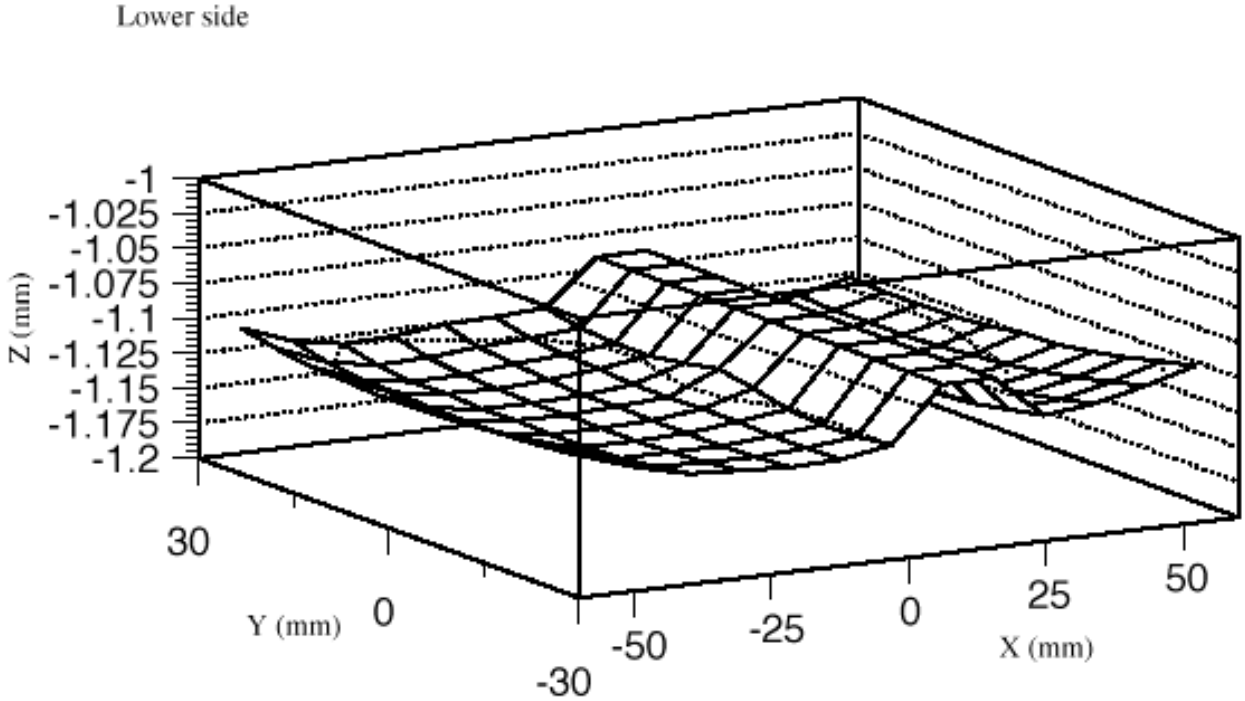
Z-Profile Survey

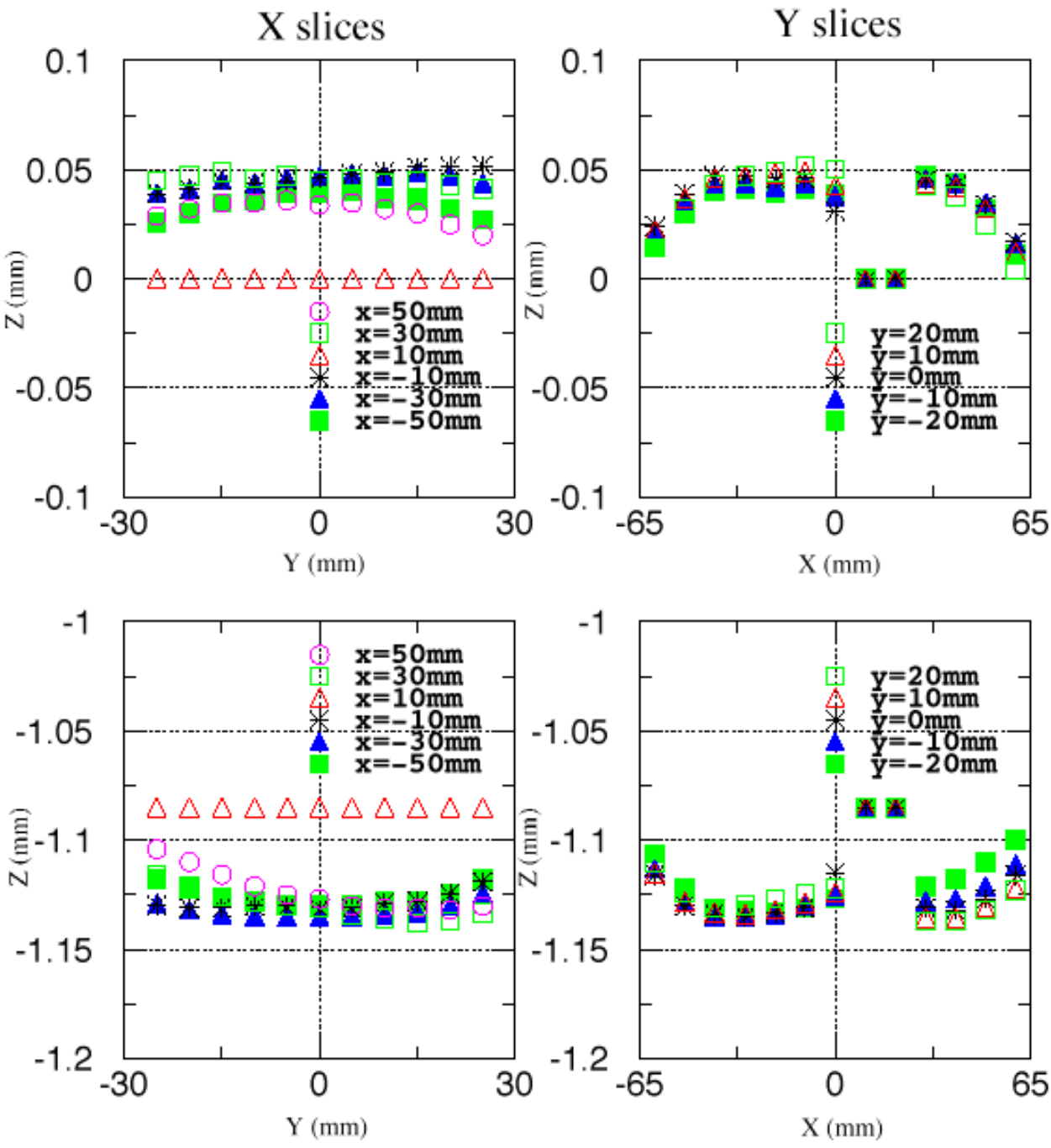
Surveyed points; 13 x 11= 143 points
(every 10mm in X and every 5mm in y)

Flatness:

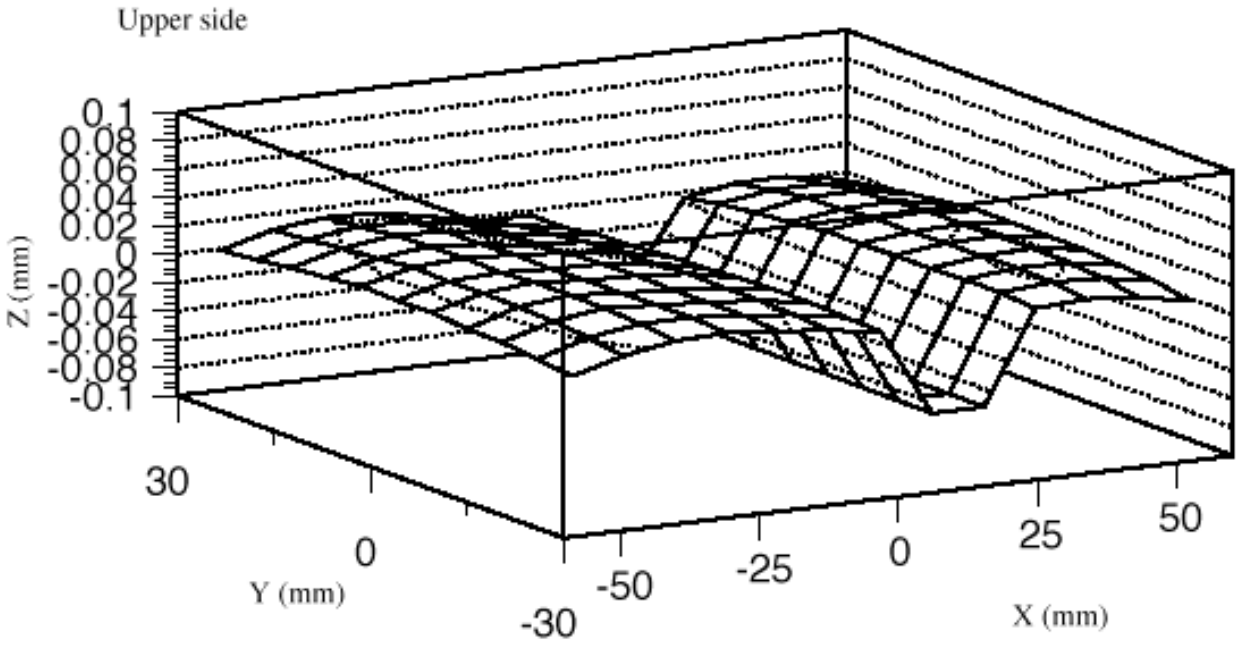
Module 1 result;

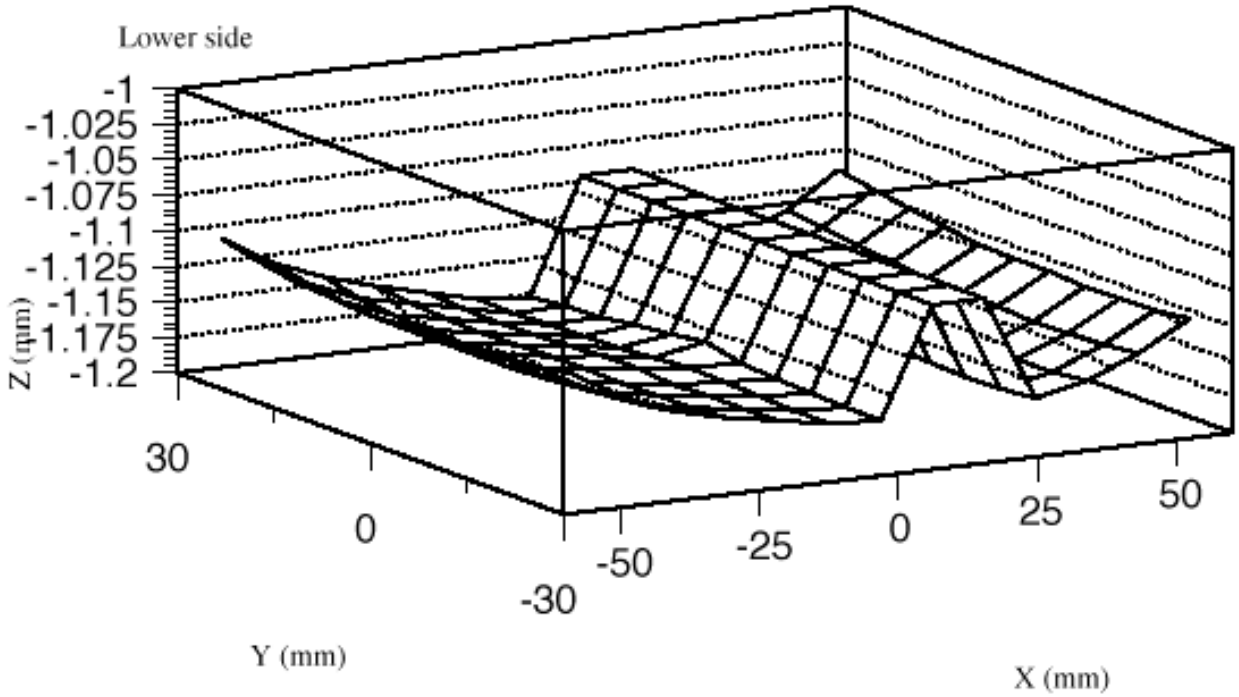


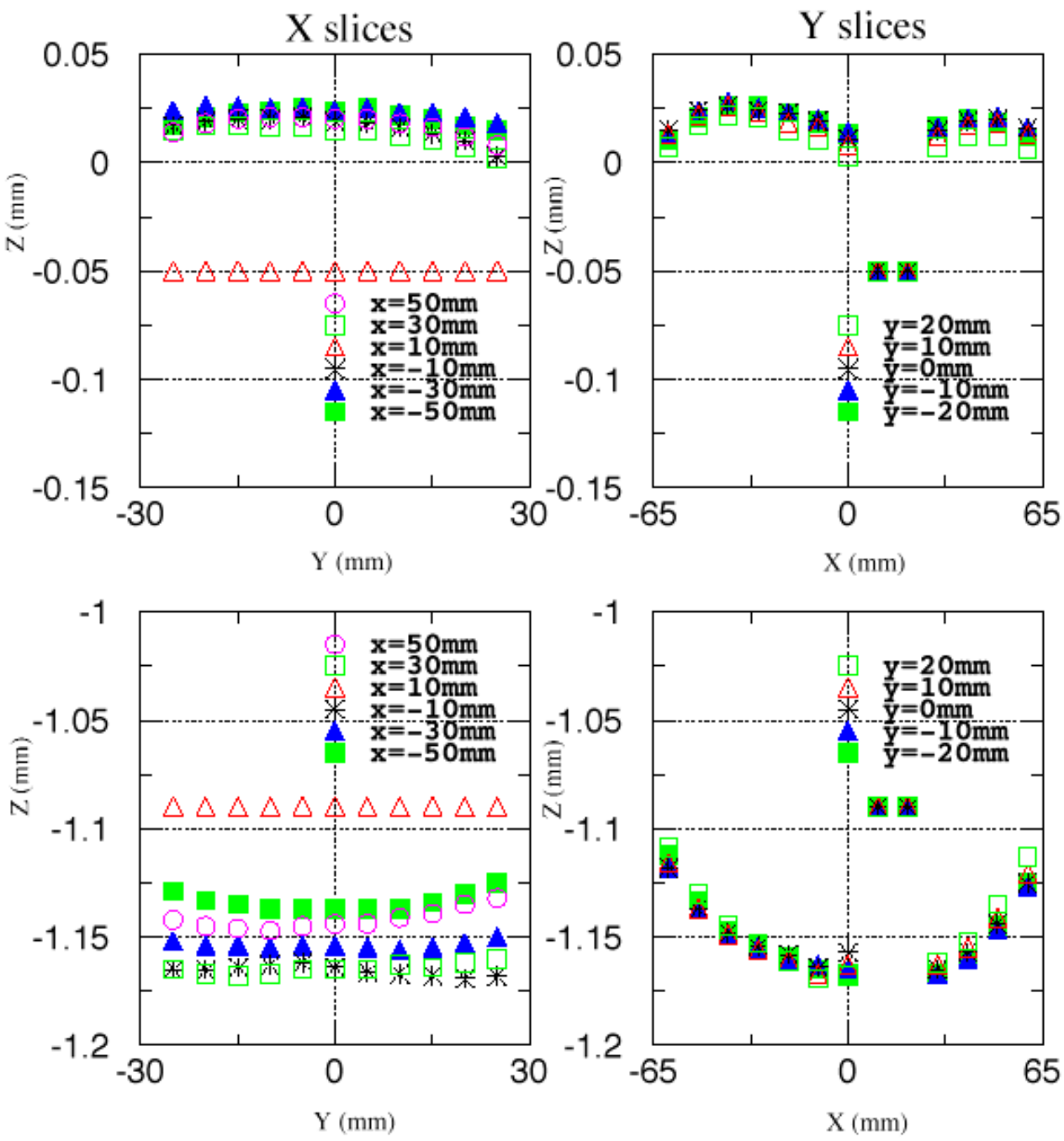



X slices
Y slices
0.1
0.05
0
-0.05
-0.1
Z (mm)
-30
0
30
Y (mm)
-65
65
X (mm)
x=50mm
x=30mm
x=10mm
x=-10mm
x=-30mm
x=-50mm
y=20mm
y=10mm
y=0mm
y=-10mm
y=-20mm
-1
-1.05
-1.1
-1.15
-1.2

Module 2 result;

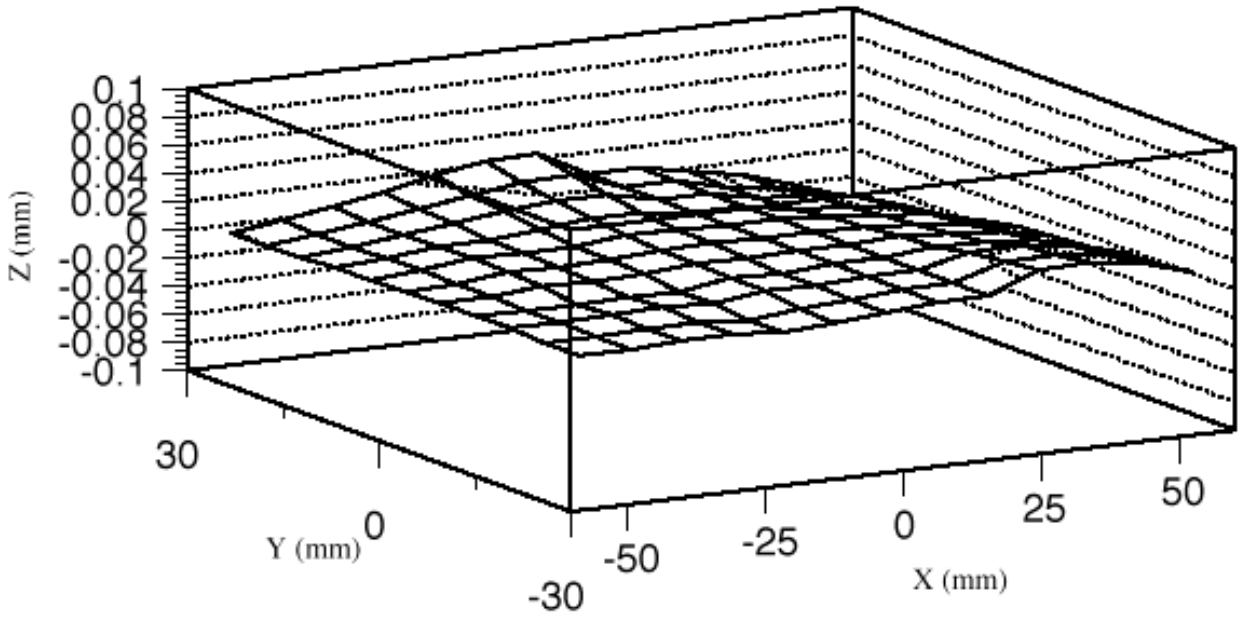




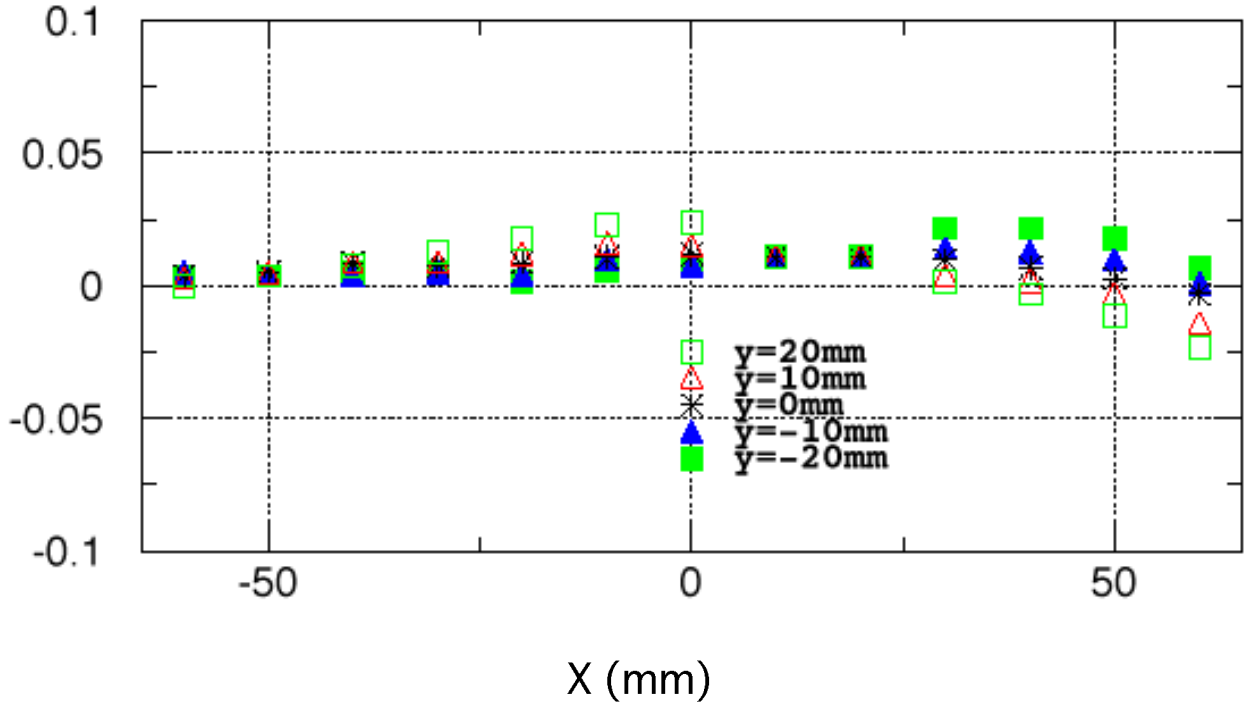

X slices
Y slices
Z (mm)
Y (mm)
X (mm)
x=50mm
x=30mm
x=10mm
x=-10mm
x=-30mm
x=-50mm
y=20mm
y=10mm
y=0mm
y=-10mm
y=-20mm

Flatness of the mid-plane:

Module 1 result;

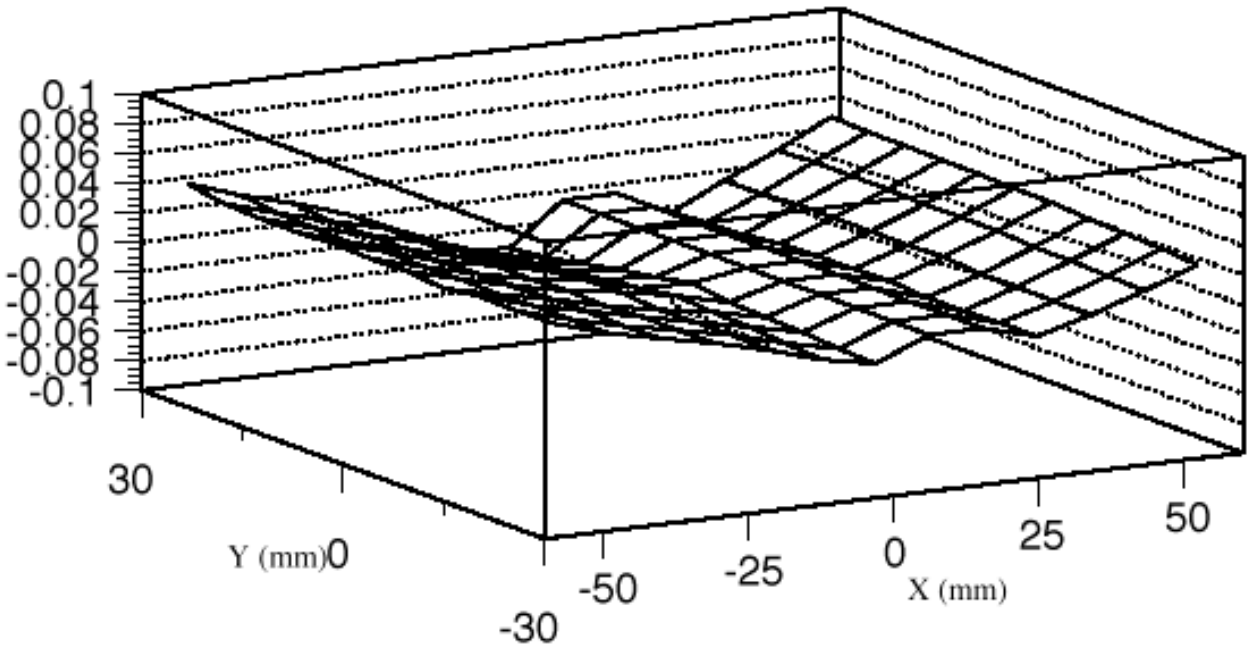


Y-slice

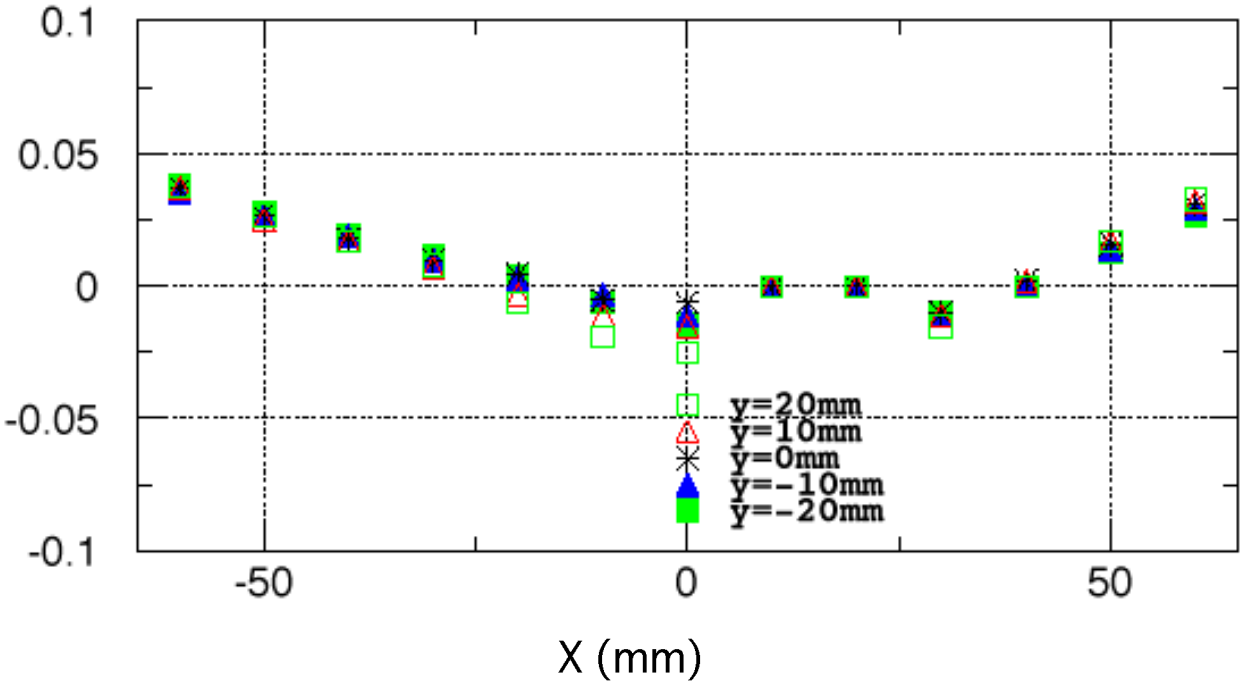


X (mm)

Module 2 result;

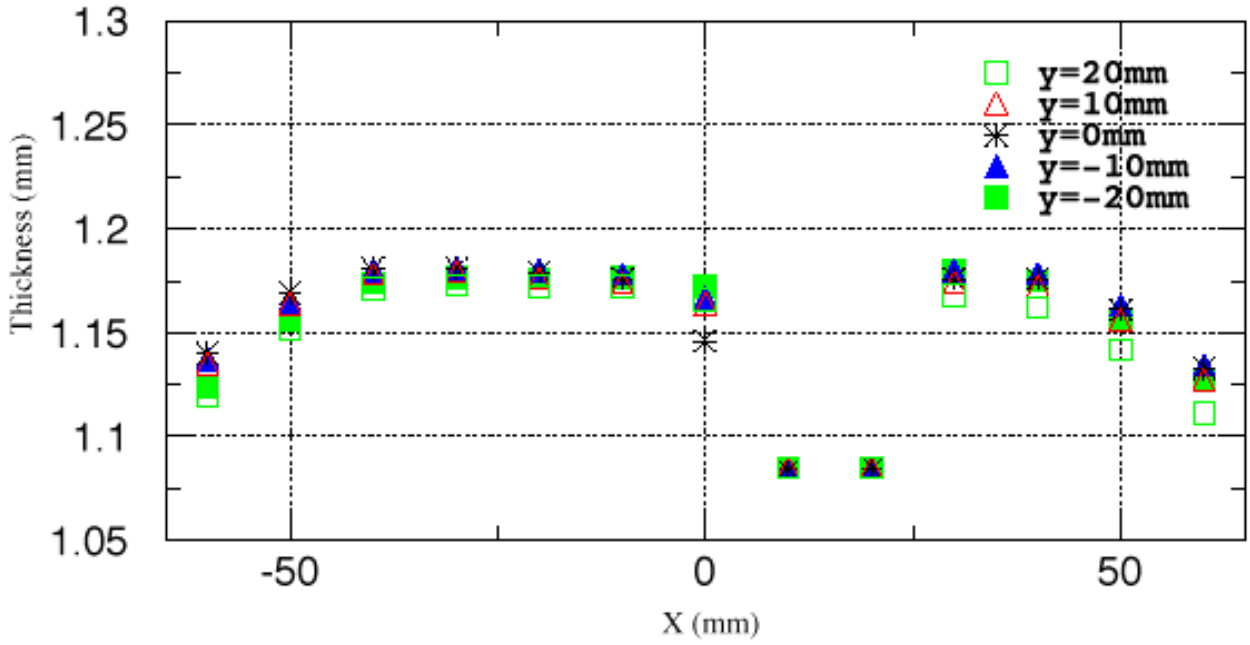


Y-slice

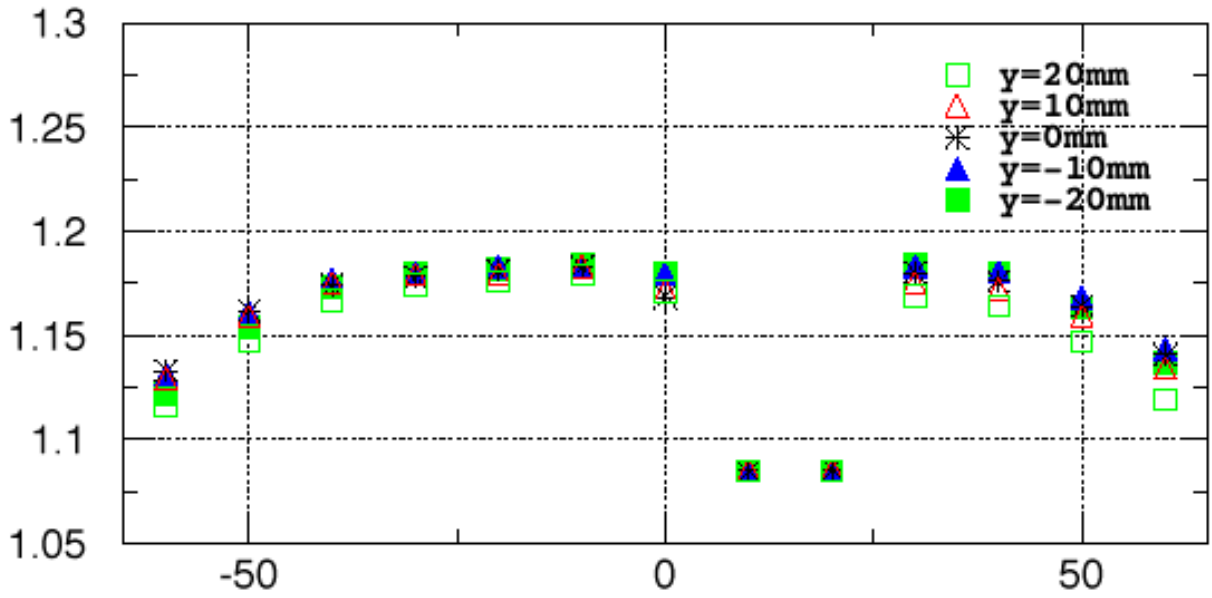


Thickness:

Module 1 result;



Module 2 result;



Conclusions

- In X-Y survey, all parameters are well within tolerance.

- Much improved Z-profile;
good flatness and uniform thickness although the intrinsic bow of the detectors is visible.

-Both modules have very similar Z-profile which is suggesting that module dependence can be small.

-The wider nose base board and two step gluing seem to be contributing these improvements.